

TECHNICAL MEMORANDUM

To: Luhdorff & Scalmanini Consulting Engineers (LSCE); Tehama County Flood Control and Water Conservation District (TCFCWCD); Corning Subbasin GSA (CSGSA)

From: Davids Engineering, Inc. (DE)

Date: March 31, 2026

Subject: **Summary of the Synoptic Stream Gaging Study in the Corning Subbasin, including Results and Recommendations**

Executive Summary

The Synoptic Stream Gaging Study was conducted to address a key data gap in the Corning Subbasin Groundwater Sustainability Plan (GSP) related to Interconnected Surface Waters (ISW) and Depletions of Interconnected Surface Water (DISW). There is currently limited understanding of and ability to evaluate stream–aquifer interactions. Addressing this data gap allows for potential refinement of either the C2VSimFG model used for the GSP or the Tehama Integrated Hydrologic Model (IHM) used for the GSPs for other subbasins in Tehama County (which has a planned expansion underway to include the Corning Subbasin). Both of these models support SGMA implementation and groundwater sustainability.

To begin addressing this gap, Davids Engineering (DE) conducted coordinated, same-day synoptic flow measurements along Stony Creek and Thomes Creek, the only streams represented as modeled reaches in both C2VSimFG and the planned expansion of the Tehama IHM. Streamflow measurements were paired with measurement or estimation of other inflows/outflows, evapotranspiration (ET), and changes in storage to develop stream-reach water budgets and calculate Net Stream Gain (NSG)—the primary indicator of gaining or losing¹ conditions. Monitoring was conducted between June 2024 and September 2025, with three days of monitoring each for Stony Creek and Thomes Creek.

Across all measurement events, both creek systems predominantly exhibited losing conditions. Stony Creek showed the largest losses. Based on measurements performed in August and September 2025, Stony Creek from immediately downstream of Orland Unit Water Users' Association's North Diversion Dam (STCK02) to just upstream of the Glenn-Colusa Irrigation District's Stony Creek siphon (STCK05) showed losses ranging from -29.2 to -82.3 CFS (i.e., -1.6 to -4.4 CFS per mile). Based on stream water budget results from the lower reach from the State Highway 32 bridge (STCK04) to STCK05, losses for this reach ranged from -29.7 to -50.6 CFS or -4.8 to -8.2 CFS per mile, representing the largest losses observed for this creek.

Integrating the entire set of measured reaches from Thomes Creek near Paskenta (TMCK01) to Thomes Creek upstream of the confluence with the Sacramento River (TMCK06) provides an overall perspective on longitudinal stream-aquifer exchange across a substantial portion of Thomes Creek. For this integrated reach, the two measurements from the spring of 2024 and 2025 suggest a NSG of -23.6 CFS (losing). Normalizing by length, this suggests a losing rate of approximately -0.9 CFS per mile on average along the 25.8 mile reach. Given measurement uncertainty, the intermediate reaches are largely

¹ While we use the term “losing” when NSG is negative, it is important to highlight that this water isn't being lost in the sense that it is no longer available for subsequent use. Rather, from the perspective of the underlying aquifer, this becomes a “gain” or source of recharge to the groundwater system.

inconclusive as to whether they were gaining or losing during monitoring. The downstream reach appears to consistently be a losing segment over a range of flow conditions. Normalizing by length, this reach had a losing rate of approximately -0.9 CFS per mile to -3.3 CFS per mile for June 20, 2024 and May 9, 2025, respectively, representing the largest losses observed on Thomes Creek.

Land-use patterns show a clear west-to-east shift toward orchard-dominated agriculture, with irrigated acreage and orchard percentages increasing moving downstream. For Stony Creek, irrigated area within a five kilometer (KM) buffer area on either side of the creek increased from 13,424 acres in the upper reach to 28,180 acres in the lower reach, with orchards comprising up to 83% of irrigated land. Thomes Creek shows a similar transition, with irrigated areas exceeding 20,000 acres downstream and orchards comprising up to 86% of irrigated land for the same five KM buffer area. The strongest measured losses coincide with these intensively irrigated downstream areas, suggesting elevated potential for pumping-induced DISW.

These results provide the Corning Subbasin with its first coordinated, reach-specific dataset for characterizing stream-aquifer interactions, evaluating modeled stream-aquifer fluxes, and informing potential refinement of C2VSimFG. Table 1 summarizes reach-scale net stream gains and losses observed during multiple monitoring events. Reported values include associated uncertainty, which reflects the combined effects of discharge measurement uncertainty as well as uncertainty in estimated changes in stream storage, miscellaneous inflows and outflows, and evapotranspiration. The results illustrate spatial and seasonal variability in gaining and losing conditions and provide quantitative results for model evaluation and potential refinement. While this Study represents significant progress toward improving ISW understanding and characterization and supporting SGMA implementation, additional data, particularly continuous streamflow and shallow groundwater elevation measurements, are needed to further improve spatial and temporal understanding of ISW before DISW magnitudes could be estimated or ISW-related Sustainable Management Criteria (SMCs) could be refined based on field data and real-world measurements.

Recommended next steps include installing additional continuous stream gages along Thomes Creek and Stony Creek; expanding shallow groundwater monitoring (with a focus near losing reaches); collecting seasonal and irrigation-season discharge data to better quantify temporal variability in stream-aquifer interactions; refining C2VSimFG or the Tehama IHM through improved stream representation, reach-specific stage-discharge relationships, and updated wetted perimeter estimates; and integrating observed losing conditions and land-use driven pumping patterns into ISW delineations and DISW evaluations.

Table 1. Net Stream Gain by reach and measurement date. Positive values indicate gaining conditions; negative values indicate losing conditions. Values shown are in cubic feet per second (CFS) and are presented as calculated Net Stream Gain $\pm$ total uncertainty, which incorporates uncertainty associated with discharge measurements, estimated changes in stream storage, miscellaneous inflows and outflows, and evapotranspiration. Null values for specific reaches and dates mean that sufficient data were not available to estimate NSG.

Reach	Monitoring Date and Net Stream Gain (CFS) for each Reach			Interpretation
	Aug 22, 2025	Aug 27, 2025	Sep 12, 2025	
STCK02-STCK05 (Combined)	-29.2 $\pm$ 8.4	-82.3 $\pm$ 12.1	-48.5 $\pm$ 7.5	Strongly losing
STCK02-STCK03 (Upstream)	-11.1 $\pm$ 6.4	-13.3 $\pm$ 11.3	+0.1 $\pm$ 5.0	Losing with occasional near-neutral conditions
STCK03-STCK04 (Midstream)	-9.9 $\pm$ 4.1	-18.4 $\pm$ 5.4	-12.6 $\pm$ 6.5	Losing
STCK04-STCK05 (Downstream)	-29.7 $\pm$ 5.2	-50.6 $\pm$ 4.1	-36.1 $\pm$ 4.7	Strongly losing
Reach	June 20, 2024	May 9, 2025 ²	Aug 21, 2025	Interpretation
TMCK01-TMCK06 (Combined)	-23.9 $\pm$ 2.8	-23.2 $\pm$ 22.1		Losing
TMCK01-TMCK02 (Upstream)	-3.0 $\pm$ 2.7	-10.6 $\pm$ 17.7	-0.8 $\pm$ 2.3	Inconclusive; slightly losing with high uncertainty
TMCK02-TMCK04 (Midstream)		+6.6 $\pm$ 17.4		Inconclusive; gaining with high uncertainty
TMCK02_-TMCK05 (Combined)	-12 $\pm$ 2.5	+8.7 $\pm$ 18.8		Inconclusive; alternates gaining/losing with high uncertainty
TMCK04-TMCK05 (Midstream)		+2.5 $\pm$ 20.3		Inconclusive; gaining with high uncertainty
TMCK05-TMCK06 (Downstream)	-6.1 $\pm$ 1.3	-21.7 $\pm$ 20.7		Losing

² Uncertainty in Net Stream Gain (NSG) estimates on May 9, 2025 is substantially higher than on other measurement dates due to elevated streamflows measured during this event. Under higher flow conditions, individual discharge measurement uncertainties increase and propagate through the NSG calculation, resulting in larger combined uncertainty values. As NSG is computed as the difference between multiple flow measurements, higher absolute flows amplify propagated uncertainty even where relative measurement uncertainty remains low.

1 Introduction

The Tehama County Flood Control and Water Conservation District (TCFCWCD) and Corning Subbasin Groundwater Sustainability Agency (CSGSA) serve as the Groundwater Sustainability Agencies (GSA) responsible for implementing the Sustainable Groundwater Management Act (SGMA) within the Corning Subbasin, which is shown in Figure 1. As the GSAs, TCFCWCD and CSGSA are charged with managing groundwater resources sustainably, tracking groundwater conditions, and implementing the Corning Subbasin Groundwater Sustainability Plan (GSP). The GSP outlines the strategies, monitoring networks, and management actions necessary to maintain or achieve long-term groundwater sustainability over SGMA's 20-year implementation horizon.

A foundational technical tool supporting SGMA implementation in the subbasin is the California Central Valley Groundwater-Surface Water Simulation Model – Fine Grid (C2VGSimFG). The C2VGSimFG is a numerical groundwater-surface water model built on the Integrated Water Flow Model (IWFM) platform, developed and maintained by the California Department of Water Resources (DWR). The model simulates hydrologic processes within the Corning Subbasin and surrounding areas, including groundwater flow, stream-aquifer³ interactions, recharge, pumping, and surface water diversions, along with tracking groundwater levels, storage, and conditions over time in the aquifer. By representing these processes through time, the C2VGSimFG provides a framework for quantitatively evaluating groundwater conditions, forecasting future scenarios, and assessing whether management actions will meet SGMA sustainability requirements. This model is described in great detail in Appendix 4 of Corning Subbasin's GSP (CSGSA TCFCWCD 2024). The GSAs are also currently expanding the Tehama IHM (used for the same purposes in the other subbasins within Tehama County) to include the Corning Subbasin.

A critical element of SGMA is the requirement that GSAs understand and manage Interconnected Surface Waters (ISW) and Depletions of Interconnected Surface Water (DISW). DISW is the sixth and final undesirable result defined in SGMA. The minimum threshold for this sustainability indicator "...shall be the rate or volume of surface water depletions caused by groundwater use that has adverse impacts on beneficial uses of the surface water and may lead to undesirable results." (23 CCR §354.28) An undesirable result for ISW is define as a DISW that would cause "significant and unreasonable" negative impacts on surface water use within the subbasin (23 CCR § 10721). These stream-aquifer interaction and exchange processes determine how groundwater pumping reduces surface-water flows in connected streams and rivers. The Corning Subbasin GSP identifies ISW as an important sustainability concern but also notes that data gaps—including limited stream gages on Thomes Creek and shallow monitoring wells within the subbasin—make it difficult to quantify the timing, magnitude, and location of these interactions. SGMA requires GSAs statewide to evaluate and quantify DISW by 2027, and DWR has issued statewide guidance, technical papers, and Recommended Corrective Action in their letter of determination emphasizing the need for improved characterization of ISW (DWR 2025).

³ Water that infiltrates the ground moves vertically and/or horizontally (depending on aquifer characteristics) and is often ultimately stored in open spaces or pores beneath the surface of the ground. An aquifer is an underground area saturated with water (saturated zone); there is often also a layer above the saturated zone but below the ground surface called the unsaturated zone.

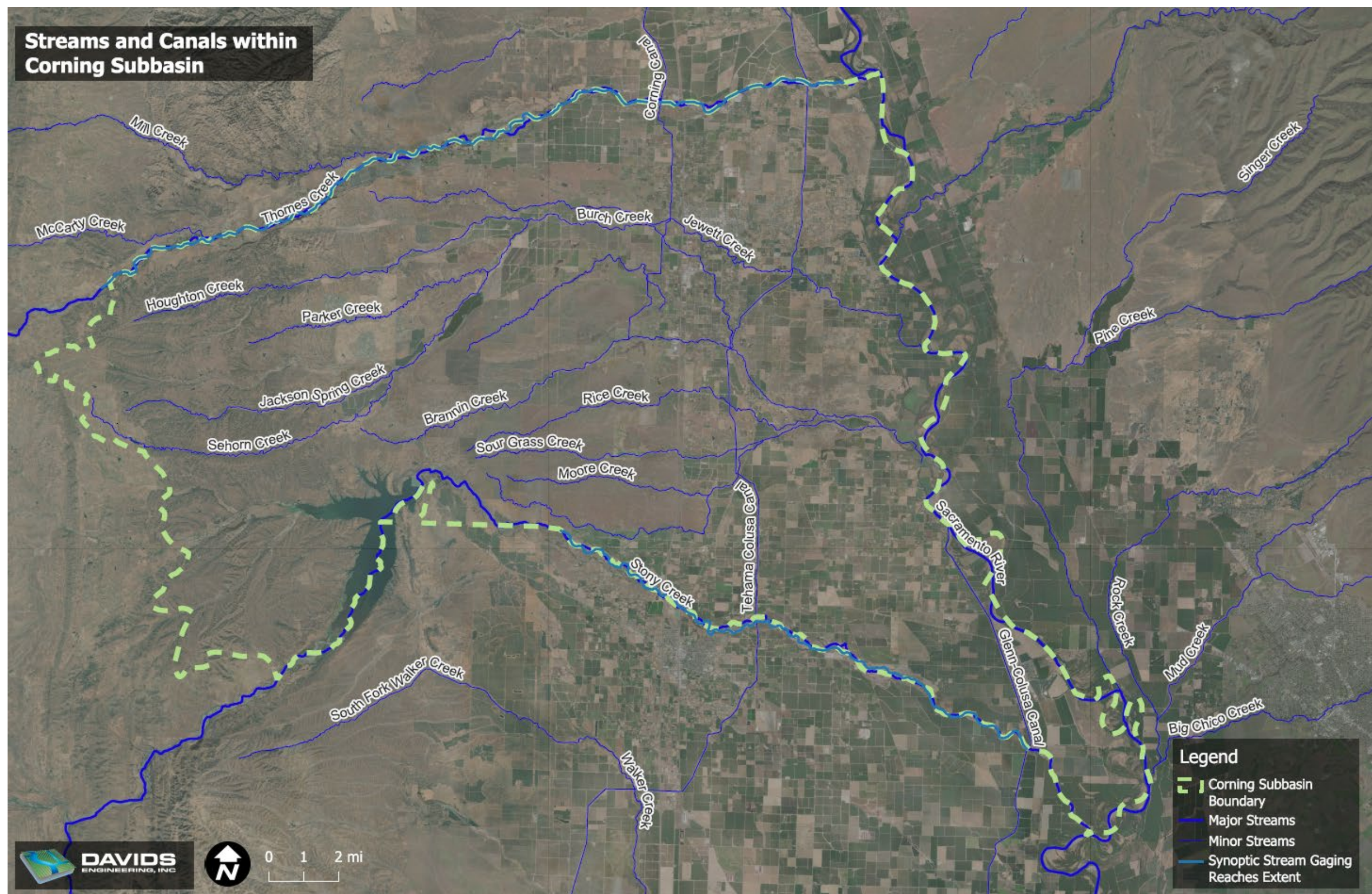


Figure 1. Map showing extent of Corning Subbasin. Major and minor streams and canals are shown. Most streams within the subbasin are seasonal or intermittent and only active during the wet months of the year or after rain events. Stoney Creek at the southern boundary of the Corning Subbasin flows out of Black Butte Reservoir year-round. Thomes Creek at the northern boundary flows most of the year but can run dry in the summer and fall during dry years.

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Although the C2VGSimSimFG and Tehama IHM models provide a valuable basin-scale framework for simulating hydrologic conditions, numerical models necessarily simplify the real-world system, and their accuracy depends on the quality and representativeness of available data. Many hydrologic processes—particularly stream–aquifer interactions—cannot be directly measured and instead must be inferred from indirect evidence, field measurements and observations, and modeled estimates. For this reason, both DWR and the Corning GSP highlight the importance of collecting new, on-the-ground data to refine model assumptions, improve representation of surface-water features, and reduce uncertainty in ISW characterization.

The Synoptic Stream Gaging Study (Study) documented in this Technical Memorandum was undertaken to collect field measurements of streamflow and related parameters to inform and improve modeling efforts and begin to address data gaps. By conducting coordinated streamflow measurements, identifying and quantifying other inflows and outflows, and developing stream-reach water budgets across Stony Creek and Thomes Creek, the Study provides empirical information on the magnitude and variability of stream–aquifer interactions under different hydrologic conditions. These data are essential for improving the model simulation of streamflows and groundwater–surface water exchange, supporting refinement of the C2VGSimFG and/or Tehama IHM and GSP implementation efforts, and strengthening the scientific foundation for meeting SGMA requirements related to ISW and DISW.

1.1 Overview of Interconnected Surface Waters (ISW)

Interconnected surface water (ISW) is defined in Title 23 of the California Code of Regulations (CCR), within the chapter on groundwater management, under CCR §351[o]. ISW is defined as “surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted.”

The definition from CCR is inclusive of both points in space and time where there is a direct connection between surface water freely flowing or ponded above the ground surface and the underlying groundwater aquifer; with this connection comes some level of interaction between ISW and groundwater. Interactions vary over space and time and are influenced by a variety of factors, including but not limited to: factors influencing the quantity and flow of surface water (such as streamflow, surface water diversions, precipitation, and surface runoff from surrounding lands), streambed and aquifer characteristics (such as their composition materials and associated porosity and permeability, and the presence of an aquitard or potential confining layer), and hydraulic gradient and conductivity.

Ultimately, interactions between ISW and groundwater are driven by two hydraulic properties (both influenced by the additional factors described above): the hydraulic gradient and hydraulic conductivity. The hydraulic gradient is the difference in water elevation between two locations and the resulting slope and hydraulic pressure caused by the force of gravity moving water from the higher location to the lower location. All else equal, a higher hydraulic gradient between ISW and groundwater will result in a higher flow rate between the two. Hydraulic conductivity is a measure of how quickly water can flow through a material; for ISW and an adjacent groundwater system, the materials of interest that conduct water are the aquifer and streambed (DWR 2024a).

For the stream-aquifer interactions occurring between ISW and groundwater, there are three different scenarios that can occur. They will be described relative to a stream, but they also apply to rivers, lakes, or other surface water features. The first scenario is a gaining stream, in which the groundwater elevation adjacent to a stream is higher in elevation, resulting in a “gain” to the stream (i.e., flow of

water from groundwater to the stream). The second scenario is a losing stream, in which the groundwater elevation adjacent to a stream is lower in elevation, resulting in a “loss” from the stream (i.e., flow of water from the stream to groundwater). The third scenario is one in which groundwater elevations are below the streambed elevation and there is not a continuous saturated zone with a hydraulic connection to the stream; this is a disconnected stream (no longer an ISW). The hydraulic gradient and conductivity influences flow rates in these scenarios, and these conditions vary over space and time (including potential shifts from gaining to losing to disconnected along the same stream over space and/or time). Figure 2 (adapted from DWR 2024a) visually depicts these three scenarios.

An additional scenario that can potentially occur is a throughflow scenario, where a stream is gaining on one bank and losing on the other bank (Berhane 2015). This is particularly relevant to California in the context of SGMA in the Central Valley, as major surface water features often form the boundary between subbasins and differing groundwater use and management has the potential to result in a throughflow scenario where the groundwater system is providing “gains” to a boundary surface water feature from one subbasin while simultaneous “losses” from the stream to the groundwater system in another subbasin are occurring.

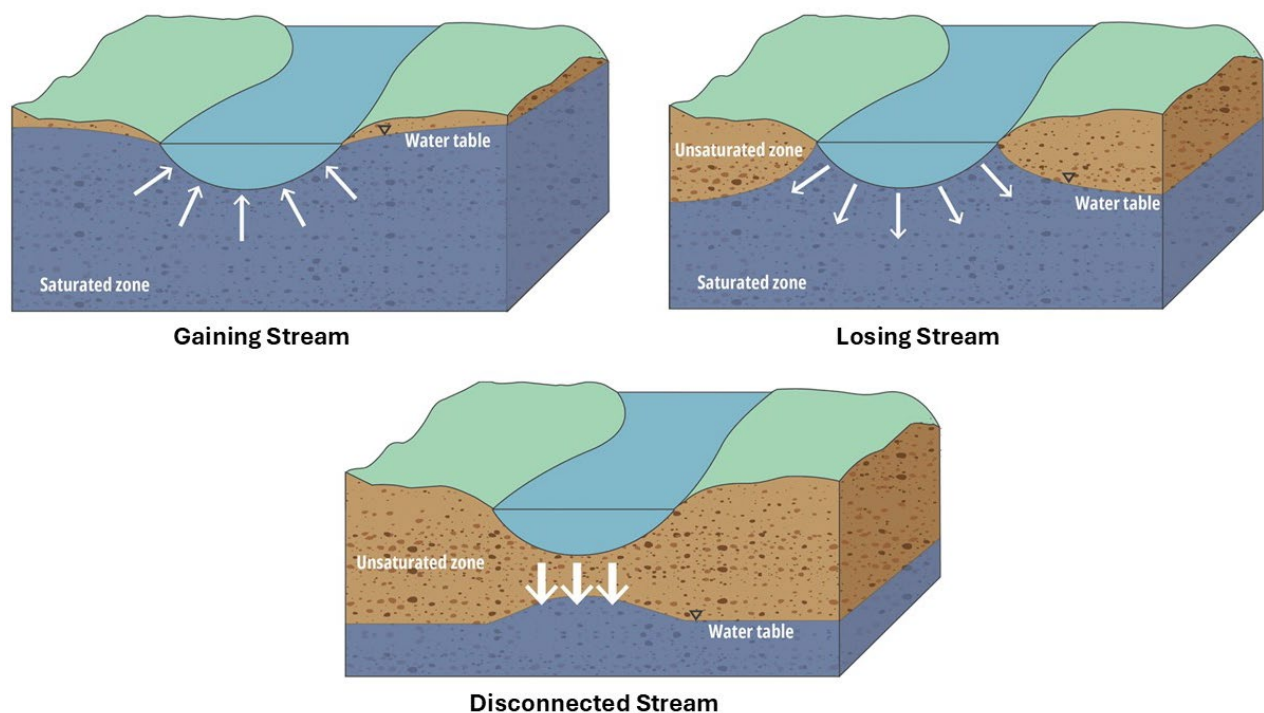


Figure 2. Schematics depicting groundwater levels and flow direction for gaining, losing, and disconnected streams (adapted from DWR 2024a).

1.2 Interconnected Surface Waters Data Gap and Recommended Actions

As described above in the Introduction, characterizing and quantifying ISW and any DISW over space and time is notoriously difficult but is necessary for sustainable groundwater management under SGMA.

The Original 2022 and Revised 2024 Corning GSP both identify significant uncertainty regarding the extent and behavior of ISW along the two primary streams that define the northern and southern boundaries of the Corning Subbasin—Thomes Creek and Stoney Creek. These uncertainties stem largely from gaps in groundwater level monitoring near these watercourses and the limited availability of surface water elevation data. Without consistent and spatially distributed datasets, it remains difficult to conclusively determine whether specific reaches are gaining, losing, or disconnected, or how to characterize those conditions shift throughout the year. To address these data limitations, the GSP relied on the North Sacramento Integrated Water Flow Model (NSac) to provide a basin-wide, process-based evaluation of potential stream–aquifer connectivity. Model results indicate that groundwater and surface water are likely interconnected year-round in the Sacramento River and seasonally within certain reaches of Stoney Creek, whereas most reaches of Thomes Creek are likely disconnected under typical conditions. However, the GSP also notes that the current monitoring network does not provide sufficient information—particularly along Thomes Creek—to empirically verify these modeled interactions (CSGSA and TCFCWCD 2022 & 2024).

Although the Department of Water Resources approved the 2024 GSP, the Department issued several recommended corrective actions intended to strengthen the Subbasin’s ability to characterize and manage interconnected surface water conditions over time (DWR 2025). With respect to ISW, DWR’s Recommended Corrective Action 5 emphasizes the importance of estimating the timing, rate, and volume of streamflow depletion attributable to groundwater pumping. DWR staff noted that in the initial review of GSPs that most GSAs struggled with the requirement of quantifying DISW but believe after several years of project and management actions designed to address data gaps, most GSAs will more fully comply with SGMA’s regulations. DWR acknowledges that this is a complex undertaking and that additional time and tool development may be required; nonetheless, these estimates are considered critical for evaluating whether GSP implementation is on track to achieve sustainable groundwater management. The Department also signaled that forthcoming statewide guidance will support GSAs in establishing quantitative sustainable management criteria (SMCs) related to ISW.

This need for improved streamflow and stream–aquifer interaction data is not unique to the Corning Subbasin; rather, it reflects a statewide challenge recognized across California’s groundwater basins. DWR has repeatedly emphasized that limited data on ISW, gaining and losing reaches, and late-season streamflow conditions is a common constraint affecting many GSAs as they work to comply with SGMA’s requirements for identifying and managing DISW. This is one reason DWR is developing additional ISW guidance, best management practices, and monitoring recommendations—to support GSAs statewide in filling these gaps and strengthening the technical basis for ISW-related SMCs.

DWR recommends that by the first periodic GSP evaluation, the GSA should:

- Estimate the quantity and timing of DISW across ISW reaches.
- Define undesirable results for ISW depletion and identify associated impacts on beneficial uses and users.
- Use forthcoming DWR ISW guidance to establish quantitative minimum thresholds, measurable objectives, and management actions for ISW.
- Continue to fill data gaps by collecting new monitoring data and refining interconnectivity assessments across surface-water features.
- Collaborate with local, state, and federal agencies, along with stakeholders, to understand the full suite of beneficial uses that could be affected by stream depletion.

A related recommendation—Corrective Action 6—directs the GSAs to provide a plan for filling spatial and informational gaps in the groundwater level monitoring network, including missing construction data and the notable lack of monitoring wells near Thomes Creek. Improved monitoring coverage will be essential for validating model results, evaluating spatial and temporal patterns of connection or disconnection, and supporting the development of defensible, quantitative SMCs for ISW. As the network is expanded and additional groundwater and surface water elevation data are collected along both Thomes and Stoney Creeks, the Subbasin will gain a clearer understanding of where hydraulic connectivity exists, how it varies seasonally and interannually, and whether individual reaches function as gaining, losing, or disconnected systems.

Together, these improvements—enhanced monitoring, integration of new DWR guidance, coordinated stakeholder engagement, and the use of updated analytical tools—form the foundation for a more robust and empirically supported understanding of ISW conditions in the Corning Subbasin. This strengthened framework will better position the GSAs to evaluate potential DISW, refine management actions, and ensure that the Subbasin remains on a sustainable trajectory consistent with SGMA requirements.

1.3 Surface Water Features in California Central Valley Groundwater-Surface Water Simulation Model – Fine Grid (*C2VSIMFG*)

As described above, the C2VGSimFG is a numerical groundwater–surface water model used to characterize the Corning Subbasin, develop and implement the GSP, and meet the requirements of SGMA. The section below is focused on characterization of surface water features (i.e., streams) within the Corning Subbasin. The Tehama IHM, also previously described, includes the same surface water features as C2VGSimFG.

1.3.1 Streams in Model

The C2VSimFG model contains a more detailed surface-water network than earlier regional models but still represents only a limited subset of the hydrologic features present within the Corning Subbasin. As shown in Figure 3, C2VSimFG includes modeled stream nodes along the major waterways that form the principal surface-water framework of the Subbasin—specifically the Sacramento River, Thomes Creek, and Stony Creek. These are the only streams within the Subbasin that C2VSimFG represents as active, simulated stream reaches.

There are numerous additional seasonal and intermittent streams that flow across the interior of the subbasin, but these are not incorporated into the model’s stream network. These excluded streams include smaller drainages originating in the Coast Range to the west that convey runoff, provide groundwater recharge through seepage, and influence shallow groundwater conditions. There are also multiple smaller tributaries to both Stony Creek and Thomes Creek not pictured on the map. Although these drainages flow seasonally or intermittently, they represent meaningful corridors of hydrologic interaction. Their absence from the C2VSimFG network limits the model’s ability to simulate localized stream–aquifer processes, particularly those relevant to ISW characterization.

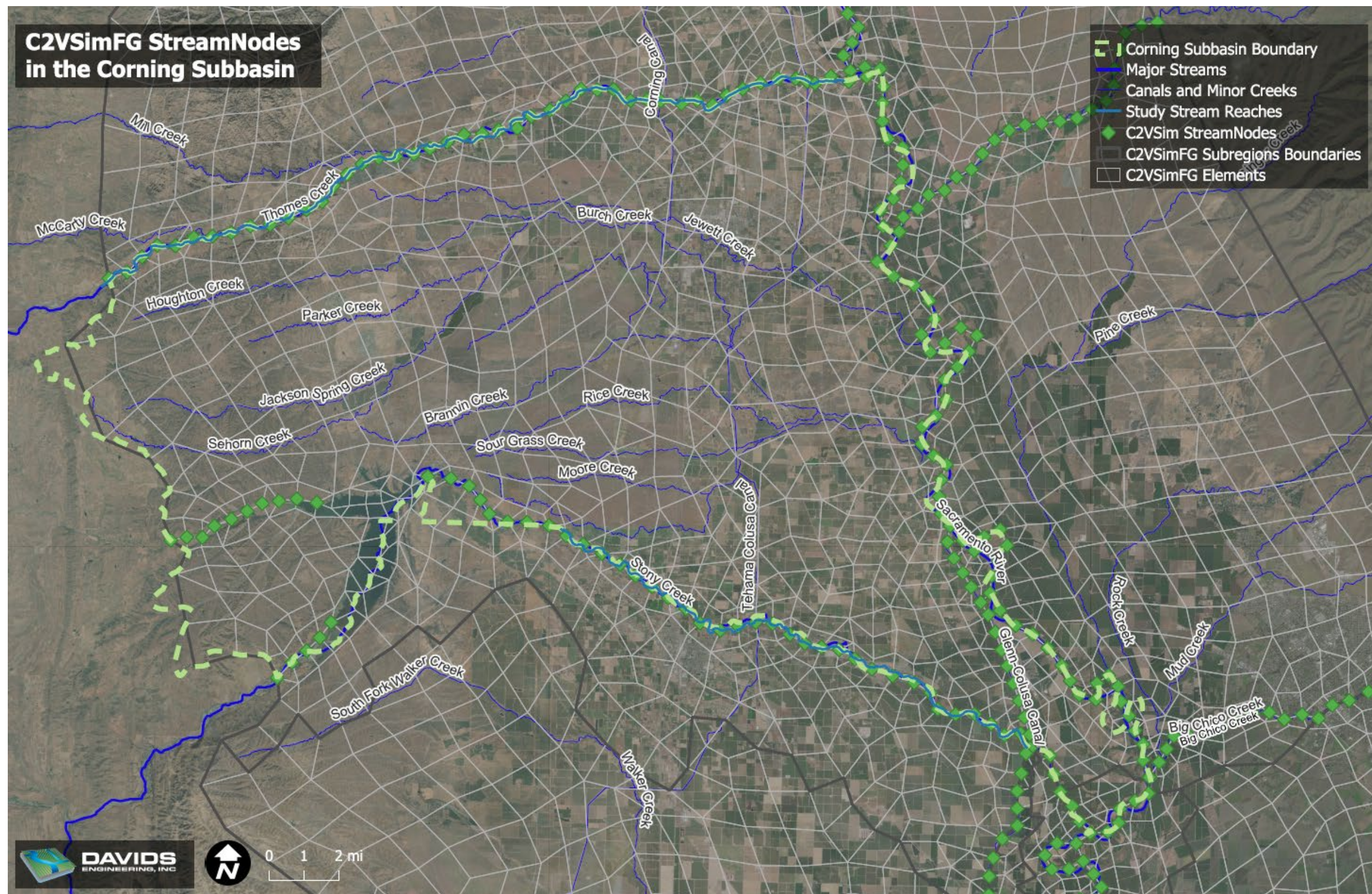


Figure 3. Modeled C2VSimFG stream nodes (green points) within the Corning Subbasin, shown in relation to major and minor surface water features. The model includes stream representation only for the Sacramento River, Thomas Creek, Stony Creek, and Glenn-Colusa Canal within the subbasin—omitting numerous smaller seasonal and intermittent streams visible in the hydrography. This limited stream network informed the selection of Stony and Thomas Creeks for synoptic stream gaging, providing empirical data to evaluate model-simulated stream-aquifer interactions along the only streams included in C2VSimFG.

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This simplified representation reflects C2VSimFG’s original purpose as a regional Central Valley-scale model, rather than a basin-scale tool designed to meet the finer spatial resolution required for analysis of ISWs. Because only Stony Creek and Thomes Creek are represented as modeled stream reaches, the model necessarily omits several hydrologic features that are important to ISW evaluation in the Corning Subbasin, including:

- Potential gaining and losing or disconnected reaches along smaller seasonal or intermittent creeks.
- Tributary inflows that may influence surface water availability and stream-aquifer interactions.
- Seasonally connected riparian or ponded areas that have potential for temporary hydraulic connection with shallow groundwater system.
- Hydraulic gradients along smaller creeks that affect pumping-induced depletions.

As illustrated in Figure 3, the model’s stream nodes (green points) are tightly clustered along Thomes Creek, Stony Creek, and the Sacramento River, while extensive areas of the Subbasin contain seasonal and intermittent streams that remain unmodeled. These smaller waterways may include reaches that may shift seasonally between gaining, losing, or disconnected conditions—dynamics that C2VSimFG cannot currently simulate.

Importantly, this model limitation directly influenced the design of the synoptic stream gaging program completed for this Study. Because Thomes Creek and Stony Creek are the only streams represented in C2VSimFG, they were selected for field measurements to provide empirical data that could be compared directly against model-simulated stream–aquifer exchanges. The synoptic gaging results supply critical real-world information to evaluate whether modeled fluxes along these two creeks reasonably reflect observed conditions, and where model refinements or parameter adjustments may be warranted.

While C2VSimFG remains a valuable tool for regional groundwater–surface water evaluation, its simplified surface-water representation means that simulated ISW conditions, especially at the reach-scale, must be interpreted with caution. Looking forward, additional measurements on excluded streams and the installation of continuous stream gages and shallow groundwater monitoring would substantially improve the empirical dataset needed to characterize ISW across the broader hydrologic network. Likewise, expanding the model to include additional streams would enhance its ability to simulate localized hydraulic gradients, quantify pumping-induced depletions, and support more scientifically defensible Sustainable Management Criteria related to ISW.

1.4 Synoptic Stream Gaging

Synoptic stream gaging—also known as stream-reach water budgeting—provides a practical, field-based method for directly determining whether individual stream reaches are “gaining” (i.e., gaining water from groundwater, with flow increasing over space moving downstream) or “losing” (i.e., losing water to groundwater, with flow decreasing over space moving downstream). The method involves conducting coordinated upstream and downstream flow measurements under steady-state hydrologic conditions, while simultaneously documenting all measurable surface inflows and outflows (e.g. tributaries, tailwater, diversions, evaporation from the stream surface), the remaining imbalance in the water budget is attributed to stream–aquifer exchange. This residual term, the Net Stream Gain (NSG), represents either (1) groundwater discharge to the stream for gaining reaches or (2) seepage losses from the stream to the aquifer for losing reaches.

Stream–aquifer interactions along Stony Creek and Thomes Creek vary meaningfully in both space and time. As illustrated conceptually in Figure 4, seasonal changes in groundwater gradients, tributary runoff from the Coast Range, diversions, irrigation return flows, land use, streambed permeability, and local channel morphology all influence whether a given reach is gaining, losing, or hydraulically disconnected. These dynamic conditions pose challenges for regional models such as C2VSimFG or Tehama IHM, which should rely on field-based data to confirm whether simulated stream–aquifer fluxes are representative of actual conditions within the Corning Subbasin. Similar to how groundwater models are often compared to actual measured groundwater levels for calibration, a comparison of modeled results for ISWs to field data and actual measurements of streamflow or hydraulic gradients can be a helpful reference point for testing model simulations and potentially guiding model refinements.

As noted in the Corning Subbasin GSP and reinforced in DWR’s Recommended Corrective Actions (as described in Section 1.2), the Subbasin currently lacks sufficient measured streamflow data to fully characterize ISW conditions or evaluate DISW. Synoptic gaging provides a direct and independent dataset that can be compared with C2VSimFG-simulated fluxes along Stony Creek and Thomes Creek. Areas where field measured NSG aligns with modeled fluxes help build confidence in the model’s representation of stream–aquifer interactions, while locations with notable discrepancies may indicate the need for model refinement, improved streambed parameterization, or additional monitoring. A model that accurately reproduces measured field conditions increases confidence in its ability to simulate future hydrologic scenarios, estimate DISW, and support SGMA compliance.

The synoptic stream gaging completed for this Study was specifically designed to fill data gaps by establishing reach-scale water budgets along selected portions of Stony Creek and Thomes Creek. These field measurements quantify the magnitude and direction of stream–aquifer exchange and provide new empirical evidence to support refined characterization of ISW within the Corning Subbasin. This enhanced understanding of where and when gaining, losing, or disconnected conditions occur strengthens the technical foundation needed for sustainable groundwater management and advances the Subbasin’s ability to meet SGMA requirements related to ISW and DISW.

Figure 4 depicts the different synoptic stream gaging fluxes (or stream reach water budget components) quantified as part of this effort. As described above, after quantifying all other inflows and outflows, the NSG can be calculated as the closure term (see Section 2.6.1 for more details).



Figure 4. Conceptual illustration of a stream reach water budget for Stony Creek in Tehama County showing the major flux components used in the Study. Stream inflows (SI), stream outflows (SO), precipitation (P), evapotranspiration (ET), miscellaneous inflows (MI), and miscellaneous outflows (MO), and net stream gain (NSG) all contribute to the stream reach water budget for a defined reach (outlined in orange). This framework allows field measurements and estimated fluxes to be integrated to quantify NSG and evaluate stream–aquifer interactions. Note that stream outflow (SO) is the amount of flow continuing downstream of the stream reach in the surface stream even though the arrow could be misinterpreted to mean that it is infiltrating through the streambed. A stream reach water budget schematic is also included in Figure 7.

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2 Methods

The following sections provide a description of the approach to the Study regarding the methods and materials used for field data collection, data processing and analysis. Specific topics covered in these sections include site selection, monitoring equipment, field data collection, quality control, and data analyses.

2.1 Overview of Approach

As described previously, synoptic stream gaging (*i.e.*, stream reach water budgets) was completed to collect new in-field data to improve understanding of stream-aquifer interactions in the Corning Subbasin. Locations along Stony Creek and Thomes Creek were selected based on: (1) relevance to C2VGSimFG's characterization of stream-aquifer interactions, (2) accessibility, which was limited by landowner approval for access to private lands and safety concerns, (3) suitability for flow measurements, and (4) the presence or absence of unmeasured inflows or outflows between an upstream and downstream flow measurement site. Ultimately five measurement sites and four stream reaches along Thomes Creek, and four measurement sites and three reaches along Stony Creek were used in the Study. The approach to site selection and equipment and methods used for data collection are described below.

2.2 Site Selection

2.2.1 Stream Reaches

The stream reaches identified for the synoptic stream gaging study are shown in Figure 5 and Figure 6. However, other site characteristics and factors needed to be considered for selection of stream reaches for water budgets. These characteristics and factors included the need to have measurable or estimable (and preferably limited) inflow and outflow locations with the reach, such as tributaries or diversions. If inflows and outflows could not be identified and measured or estimated in any reach, the water budget's closure term may be inaccurate. Access to measurement locations was one of the primary constraints of measurement sites as nearly all of Thomes and Stony Creek is surrounded by private land. Finally, the size of the reach matters: Stream reaches needed to be large enough to have some certainty regarding the potential presence of the substantial stream-aquifer interaction, but small enough to have some spatial specificity regarding where those interactions may be taking place.

2.2.1.1 Thomes Creek

After reviewing potential reaches and their associated characteristics and factors, a total of four reaches along Thomes Creek were selected for development of stream reach water budgets as part of the Study. The furthest upstream measurement was taken near Paskenta (TMCK01), just downstream of DWR's stream gage. Additional measurements were then taken downstream of the bridge on Corning Rd (TMCK02), at the bridge on Simpson Rd (TMCK04), at the bridge on Rawson Rd (TMCK05), and near Hall Rd just upstream of the confluence with the Sacramento River (TMCK06). Thomes Creek Water Users Association (WUA) diverts a relatively small volume of water off Thomes Creek between TMCK02 and TMCK04; a measurement site in this reach (TMCK03) was initially planned for inclusion in the Study, but was abandoned due to unsuitable flow measurement conditions and access issues.

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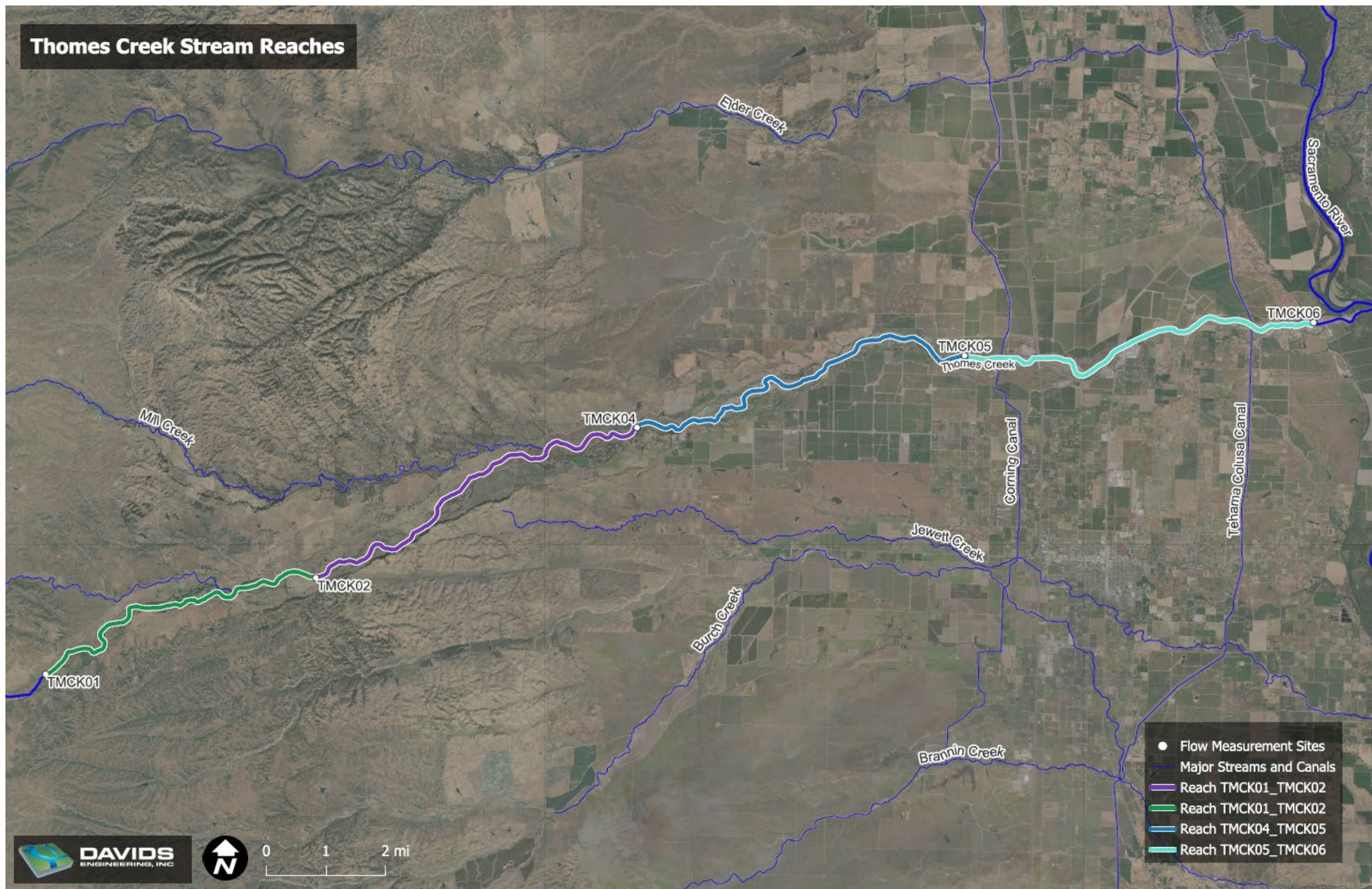


Figure 5. Flow measurement locations and stream reaches along Thomas Creek. The figure shows the upstream and downstream measurement sites used for synoptic stream gaging, diversion locations, and the delineated stream reach segments included in water budget analyses.

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2.2.1.2 *Stony Creek*

A total of three reaches were identified along Stony Creek as shown in Figure 6. The locations of six spills from Orland Unit Water Users Association's (WUA) North and South diversions from Stony Creek were identified along the middle reach (STSP01-STSP06) but only one (STSP06) was active during measurements. The furthest upstream measurement location was immediately downstream of Orland Unit WUA's north diversion dam (STCK02). Further measurements were taken at the Knife River plant upstream of I5 (STCK03), at the bridge on State Hwy 32 (STCK04), and upstream of Glenn-Colusa Canal siphon under Stony Creek (STCK05).

2.3 Monitoring Equipment

2.3.1 Field Data Collection Forms

In order to record measurements and observations in the field for the Study, DE used field tablets loaded with custom data collection forms built using an open-source data collection tool called Open Data Kit (ODK)⁴; ODK utilizes user-built Microsoft Excel files using a standard called XLSForms⁵ to create survey forms with step-by-step instructions for field data collection. While in the field, the survey forms were completed using the field tablets and submitted. The forms can be configured to request and record location using Global Positioning System (GPS) functionality of the field tablet, time of data collection, and a variety other of user-provided inputs such as photos, numeric values, and text entries. The review and evaluation of data entered through field data collection forms is described in Sections 2.4 and 2.5. One ODK form was utilized for primary data collection as part of the Study, with additional miscellaneous field observations or photos recorded using other ODK forms.

2.3.2 Streamflow Measurement Equipment

The sections below describe the devices used to measure streamflow, its measurement principles, and under what conditions they were used during the Study.

2.3.2.1 *SonTek Acoustic Doppler Current Profilers*

SonTek is a company that designs, manufactures, and sells Acoustic Doppler Current Profilers (ADCPs) for hydroacoustic environmental water data collection. Two ADCPs from SonTek were used in the Study: the M9 and RS5 RiverSurveyor (RiverSurveyor). ADCPs are typically mounted onto a moving boat that transects the water surface and obtains profiles of water velocity and depth. Water velocity and depth data are measured by an ADCP through transmitting sound at known frequencies down into the water column and then measuring the doppler shift of reflections from particles in the water, which are assumed to be moving the same speed as the water (USGS 2013). The difference between the transmitted frequency and returned frequency can be used to calculate velocity. A RiverSurveyor provides both a discharge measurement and channel bottom cross-section measurement. For data collection in the Study, the RiverSurveyor was used in conditions where the transect was not wadable by a person due to depth or velocity. USGS protocols were followed when taking measurements (USGS 2013).

2.3.2.2 *SonTek FlowTracker2*

SonTek also produces the FlowTracker2, an Acoustic Doppler Velocimeter device (ADV). An ADV is similar to an ADCP in the technology it uses: it emits sound waves and listens for the doppler shift

⁴ More information about ODK is available at: <https://getodk.org/>

⁵ More information about XLSForms is available at: <https://xlsform.org/en/>

caused by the change in frequency to then calculate water velocity. However, it is typically mounted on a top-setting wading rod and used to measure velocity in wadable channels. The person wading in the channel measures the cross-sectional area of flow using the wading rod, as the ADV measures velocity. The FlowTracker2 has one acoustic transmitter and two acoustic receivers. A FlowTracker2 was used to measure discharge in wadable conditions, especially in conditions too shallow to perform a measurement with an ADCP. The USGS mid-section measurement protocols were followed when taking measurements with the FlowTracker2 (USGS 2010).

2.3.3 Surveying Equipment

For surveying location and respective elevation of points of interest for the Study, EMLID Reach Real-Time Kinematic (RTK) units were utilized. These use satellites to track locations with high precision and allow users to record their locations of interest and associated notes. An EMLID Reach RTK equipment configuration usually consisted of a Base Unit (Base) and a Rover Unit (Rover). The Base is set up as a stationary point and provides a positioning correction factor for the Rover, which is carried by the user and collects the survey points of interest. In close proximity to the Base, the Rover is precise to within 5 to 10 (MM), while the static Base has an accuracy of 4 to 8 MM (EMLID 2026). Additionally, post-processing can further improve the precision and accuracy of survey data in reference to established coordinate systems for the survey area.

When there are topographic or logistical challenges to establishing a Base Station, a subscription for a Real-Time Network (RTN) can also be used to provide positioning correction factors to the Rover. The RTN provides real-time positioning corrections to the Rover via a cell SIM card, allowing for centimeter-level precision in location information. The RTN provides correction factors based off permanent Base Stations near the area where the survey is taking place. Due to the large area of interest for this Project, an RTN was typically used for correction factors.

2.4 Field Data Collection

2.4.1 Field Data Collection Forms

As described previously, one ODK form was primarily utilized for field data collection. An ODK form developed by DE was used to collect the flow measurement data and site conditions of each flow measurement. As described previously, the form was loaded onto a field tablet, which was used to record measurements and observations in the field during the Study.

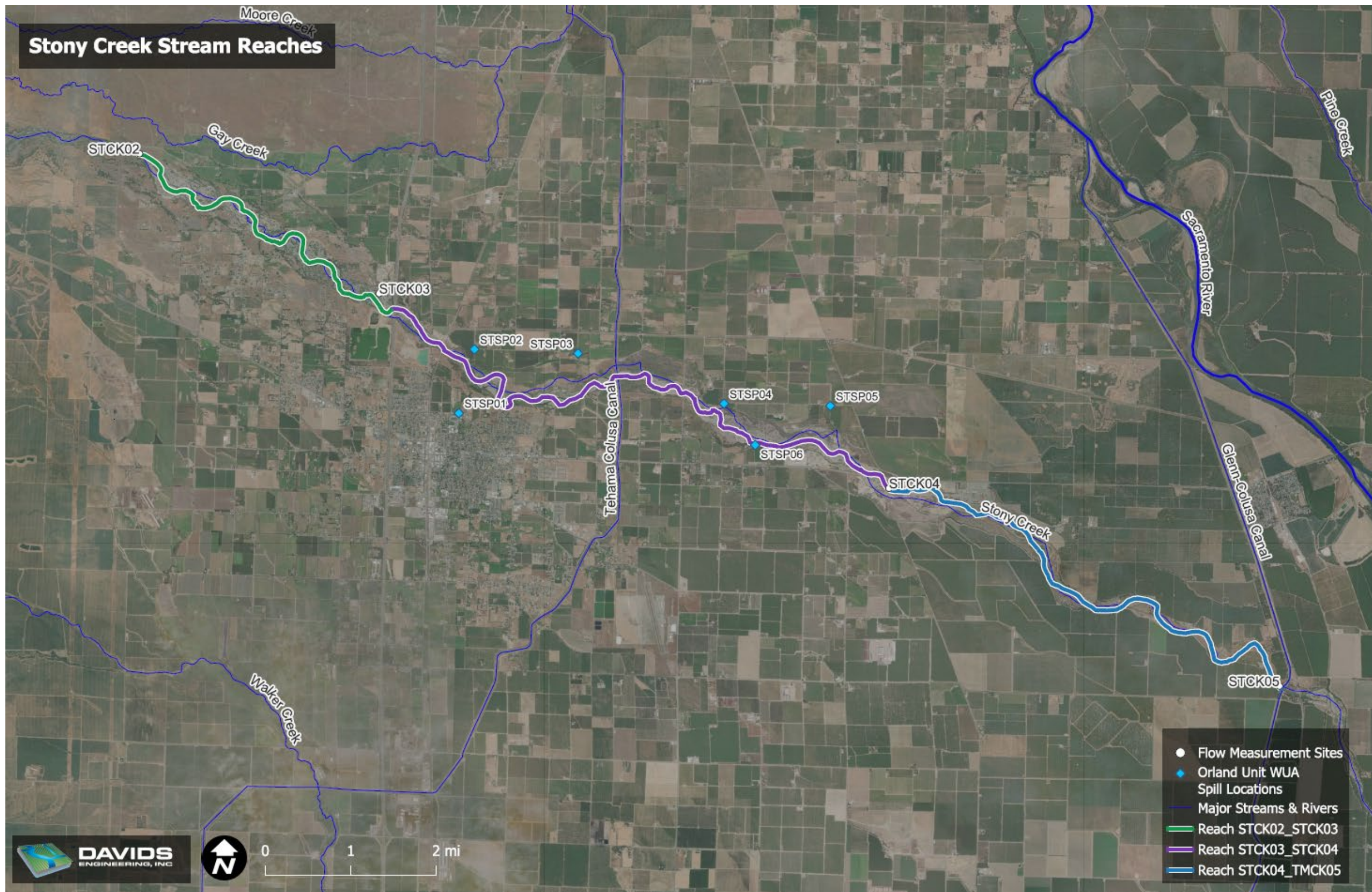


Figure 6. Flow measurement locations and stream reaches along Stony Creek. The figure shows the upstream and downstream measurement sites used for synoptic stream gaging, spill locations, and the delineated stream-reach segments included in water budget analyses.

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2.4.2 Streamflow Measurement Equipment

As described previously, streamflow measurements were performed with either the RiverSurveyor or FlowTracker2, depending on site conditions and desired data for the Study. The majority of the time the RiverSurveyor was used to collect flow measurement data due to site conditions, and with added benefit of collecting bathymetry data and a flow measurement simultaneously. On some occasions, site conditions at the measurement location were too shallow to use the RiverSurveyor, and the FlowTracker2 was used instead. For RiverSurveyor data collection, a remote-control boat was used to pilot the RiverSurveyor across the stream in a transect as perpendicular to flow as possible in locations that had straight sections both above and below the measurement sites. Typically, four to six transects were completed for each flow measurement; however, if these transects did not seem representative of site conditions or showed great variability or fluctuations, then additional transects were conducted.

2.4.3 Surveying Equipment

The EMLID RTK unit was used in the field to collect two different types of data. Water surface elevation (WSE) points at the time of the streamflow measurement, along with any other site-specific points of interest. These WSE points at the time of measurement provide a stream stage elevation relative to mean sea level that could be compared to adjacent shallow groundwater elevations. EMLID RTK data were also used as the GNSS positioning system for the RiverSurveyor, as it completed transects for each streamflow measurement; this allows EMLID RTK data to provide location for RiverSurveyor under an established coordinate system in real-time as it completes its transects.

2.5 Quality Control

2.5.1 Field Data Collection Forms

After data collection in the field and submittal via the field tablet, the data entries for each ODK Form were stored in a central database that was then paired with a custom web application called the Davids Engineering Data Portal (Data Portal). The Data Portal programmatically pulled and stored all entries from completed ODK forms held in the database via an application protocol interface (API). Through the Data Portal, the measurements and observations collected in the field were viewed, edited, or downloaded; the Data Portal includes maps to show site and submission locations, features to support data quality assurance and quality control (QA/QC), access to pictures taken and submitted via an ODK form, and customizable data graphing and visualizations. Importantly, the Data Portal was designed to include a QC flag that can be set to identify which records have been reviewed and approved from a QA/QC standpoint. It also records any and all edits made to data, including when and by whom edits to data entries were made, and includes a simple method for restoring submissions to prior states if needed. After a QA/QC data review and approval via setting the QC flag value, the field data were ready for analysis and evaluation.

2.5.2 Streamflow Measurement Equipment

After the streamflow measurement data were collected, the RiverSurveyor ADCP measurements were post-processed using QRev⁶ and the accompanying ODK forms were reviewed (as described previously) to ensure the flow measurement data was attributed to the correct site and the flow measurement values were updated to post-processed values from QRev. FlowTracker2 measurements were reviewed

⁶ QRev is a public domain software product developed by the USGS designed to process and analyze ADCP data. It combines quality control, data visualization, and report generation. For more details see: [QRev 4 | U.S. Geological Survey \(usgs.gov\)](#)

in SonTek software, with QA/QC focused primarily on verifying appropriate correction factors near channel margins and ensuring that measurement settings, velocity cells, and cross-section geometry were properly recorded; only minimal revisions to accompanying ODK forms were required.

2.5.3 Surveying Equipment

The survey data collected in the field using the EMLID RTK unit were also reviewed for QA/QC, with corrections or adjustments as necessary, prior to their use in the final Study dataset for analysis and evaluation.

2.6 Data Analysis

Following the planning, data collection, and quality control and review described in the previous sections, this section describes the methods for the data analyses completed to calculate stream reach water budgets for the Study.

2.6.1 Stream Reach Water Budget

A water budget quantifies all inflows to and outflows from a specific area of interest, while also accounting for change of storage within the area of interest. Based on the principle of the conservation of mass, if change in storage and all but one flow path are independently measured or estimated, the final flow path can be solved for as the closure term. The principle of the conservation of mass states that the difference between total inflows to and outflows from an area of interest for a given period of time is equivalent to the change in stored water within that accounting center. This is presented in Equation 1 below.

Equation 1. Water budget mass balance.

$$\text{Inflows} - \text{Outflows} = \text{Change in Storage } (\Delta S)$$

Each stream reach water budget required quantification of all water inflows and outflows. These included stream inflow (SI) to the reach, stream outflow (SO) from the reach, any miscellaneous surface inflows (MI) to or outflows (MO) from the reach (including diversions), evapotranspiration (ET) from the reach, precipitation (P) into the reach, and net stream gains (NSG) for the reach. Each of these terms can be thought of as a flux, or rate, through the control volume (i.e., stream reach). To the greatest extent possible, the measurements and estimates comprising each water budget were performed during steady state conditions on the river and during the same day. Figure 7 depicts a typical stream reach water budget and the various possible inflows and outflows. Equation 2 represents the water budget mass balance equation for a stream reach: it shows all inflows on one side of the equation and outflows on the other; they need to be equal to each other after accounting for change in storage within the stream reach.

The closure term for the stream reach water budgets was net stream gain (NSG), which is impossible to practically measure through field data collection and was the primary flow path of interest for this analysis. Equation 2 is solved for NSG to determine Equation 3: After quantifying every other flow path in the stream reach water budget, NSG can be calculated to close the mass balance. For stream reach water budgets, each term was calculated as a flow rate with units of CFS.

Equation 2. Water budget mass balance for a stream reach.

$$SI + MI + P + NSG = SO + MO + ET \pm \Delta S$$

Where:

- *SI* = Surface Inflows (Flow entering the control volume from the stream)
- *MI* = Miscellaneous Inflows (Drainage, pumping into control volume, etc.)
- *P* = Precipitation
- *NSG* = Net Stream Gain
- *SO* = Surface Outflows (Flow exiting the control volume from the stream)
- *MO* = Miscellaneous Outflows (Diversion and/or pumping out of the control volume, etc.)
- *ET* = Evapotranspiration (From water surface directly and riparian habitat pulling water from control volume)
- ΔS = Change in Storage (From changing water levels during measurements)

Equation 3. Stream reach water budget mass balance solved for net stream gain.

$$NSG = SO - SI + MO - MI + ET - P \pm \Delta S$$

Where: Parameters are same as defined above.

The remainder of Section 2.6.1 describes how each individual flow path was quantified, along with the associated uncertainties in the quantification of each, and finally how all the data were organized and assembled to computer the stream reach water budgets.

2.6.1.1 Quantification of Water Budget Flow Paths and Estimated Uncertainty

2.6.1.1.1 Surface Inflows and Outflows (SI and SO)

Surface inflows and outflows are the stream flows at the upstream and downstream ends of each stream reach. These were measured using either a RiverSurveyor or FlowTracker2 as described previously. Both SI and SO were measured on the same day for a reach, but due to travel time and other required data collection, they weren't always measured consecutively. However, field data collection days were planned to have steady state or near steady state conditions, so any flow differences due changing conditions and the time difference between SI and SO measurements were minimized.

The uncertainties for SI and SO flow measurements were determined though post processing RiverSurveyor measurements with QRev software, or by the FlowTracker2 directly providing an uncertainty value. These were used in calculations as relative uncertainties.

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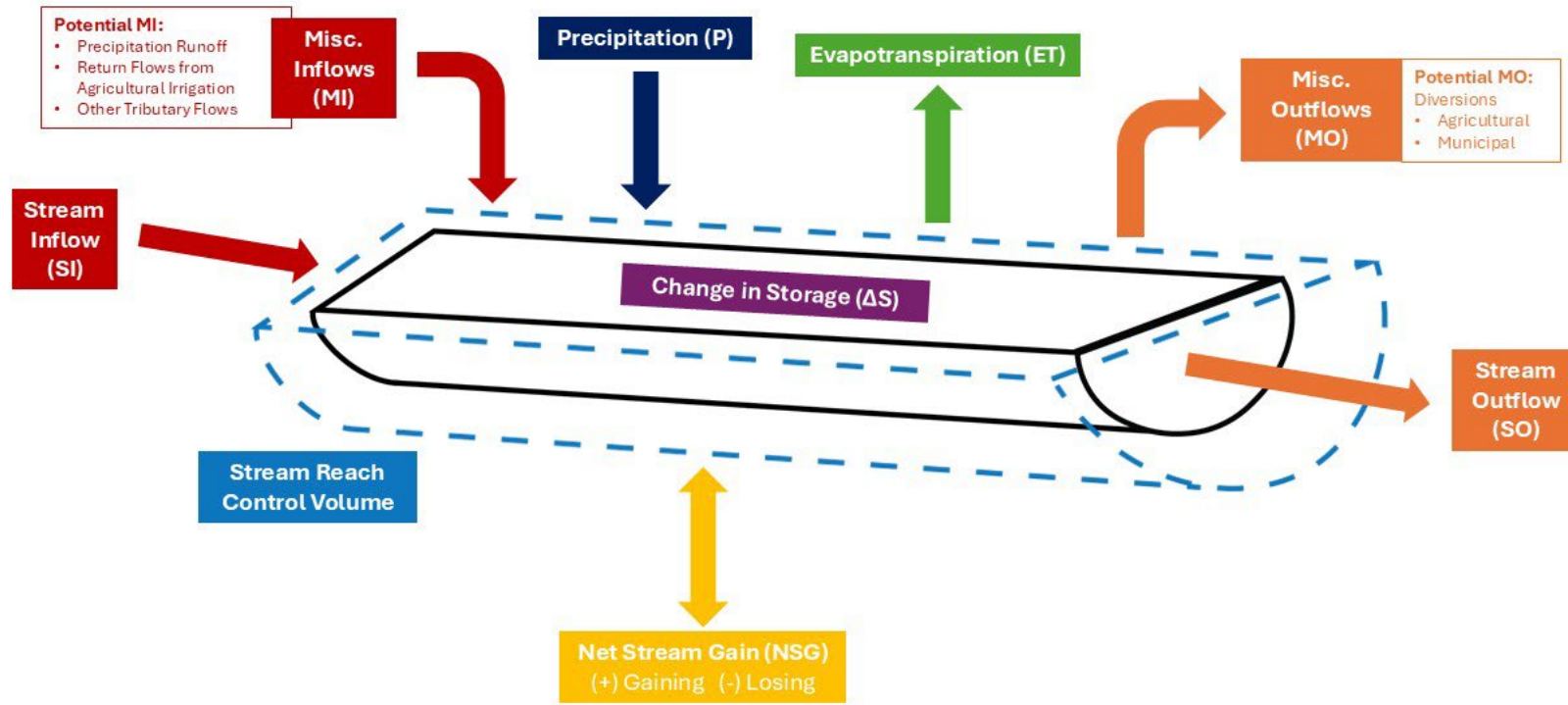


Figure 7. Stream reach water budget schematic showing all inflows to and outflows from the control volume, as well as change in storage within the control volume. After quantifying all other inflows and outflows and change in storage, net stream gain (NSG) can be solved for as the closure term.

2.6.1.1.2 Miscellaneous Inflows and Outflows (MI and MO)

Miscellaneous inflows (MI) result from any runoff, tailwater, drainage, or tributary inflows, entering the control volume. Miscellaneous outflows (MO) result from a diversion out of the control volume (either pumped or gravity-flow), or tributary outflows. The largest MI and MO flows are described in more detail below. For MI into Thomes Creek no runoff, tailwater, drainage, or tributary inflows were observed but with most adjacent land to the creek being private and inaccessible, it is possible there were some MI flows that were not captured. The Orland Unit WUA operates six spill locations that contribute miscellaneous inflow (MI) to the creek. These spills were measured during two of the three synoptic sampling events. The one missed measurement occurred because access permission had not yet been obtained from the landowner for the only spill that was actively flowing during that event. The MI for that missed measurement was assumed based on an average of the two measured MI rates. Thomes Creek WUA's diversion site was inaccessible during the measurement periods, so their diversion rates were assumed based on the volumes diverted that were reported to the State Water Board and accessed via eWRIMS. The rates were calculated based on an assumed constant diversion rate. The uncertainty was assumed to be 20% of that MO rate. Overall, as described above, field data collection was carefully planned to avoid MI and MO to the extent possible, and all identified MI and MO were quantified using available data and assumptions about typical conditions.

2.6.1.1.3 Evapotranspiration (ET)

OpenET⁷ data was used to estimate evapotranspiration (ET) from stream reaches. The estimated surface extent of each stream reach from ET occurred was calculated as the average stream width measured at the upstream and downstream site, further increased by 50% of the average stream width on either bank to account for riparian vegetation, and then multiplied by the length of the stream width to calculate a representative area. OpenET's Application Programming Interface (API) was utilized to obtain a raster dataset that with daily ET expressed in millimeters (MM) for each area at a 30-meter pixel resolution⁸. The daily ET for each pixel in the control volume was multiplied by pixel area to calculate an ET volume, and the resulting volumes were summed up for all pixels in the control volume to calculate a total volume. To convert to a flow rate, the total volume was divided by an assumed daily ET duration of eight hours. Because OpenET provides daily evapotranspiration (ET) totals, the study required a practical method for converting daily ET into an hourly flux for the reach-scale water budgets. Although actual ET varies throughout the day and generally follows a sinusoidal pattern with a mid-day peak, a full diurnal analysis was beyond the scope of this project. Therefore, an eight-hour ET duration was applied as a simplifying assumption to approximate the portion of the day during which most ET occurs. This approach provides a conservative estimate for stream-reach ET fluxes: it reflects the fact that ET is concentrated during daylight hours while also ensuring that ET is not over-represented in comparison to other components of the water budget, especially because field measurements typically occurred over roughly two to four hours. This simplification is commonly used in applied hydrologic studies when only daily ET data are available and when the goal is to obtain an order-of-magnitude estimate of ET losses relative to other fluxes. Relative to the other fluxes in stream reach water budgets, ET was typically very small, so this conservative estimate of including all daily ET was used. Equation 4 is the one used to calculate the ET flux for stream reach water budgets.

⁷ OpenET provides satellite-based spatially explicit ET data for the Continental United States. More information, including data access, is available at: <https://etdata.org>

⁸ A 30-meter pixel resolution means that the raster is comprised of 30 meter by 30 meter squares (pixels), with each pixel representing approximately 0.22 acres (AC).

Equation 4. ET flux equation.

$$ET\ flux = \frac{OpenET\ depth * w * l}{t}$$

Where:

- *ET flux* = evapotranspiration flux from the stream reach (CFS)
- *OpenET depth* = evapotranspiration depth provided by OpenET in MM (converted to FT)
- *w* = average stream width based on the upstream and downstream measurement width, then increased by 50% of the stream width on either bank to account for riparian vegetation
- *l* = stream length between the upstream and downstream measurement locations
- *t* = period of time during which ET occurs in a day. Eight hours (28,800 seconds) was used as a conservative estimate, since field data collection typically took place over a two to four hour period.

Regarding uncertainty in estimating ET, there are multiple sources of uncertainty including estimated area over which ET occurs (stream reach width and length), the ET value itself, and the time over which ET occurs. An assumed 20% relative uncertainty was used for the calculation of stream width (based on average measured stream width and expanded area for riparian vegetation). An assumed 5% relative uncertainty was used for stream length, since upstream and downstream ends of the reach are more precisely located. A 39.8% relative uncertainty was assumed for the ET depth based upon the mean of the mean absolute error for grasslands (45.1%), mixed forests (39.6%), and wetlands (34.7%) in OpenET's evaluation of accuracy at a daily timestep (OpenET, 2021). Since all daily ET was used as a conservative estimate (as described above), no relative uncertainty related to time duration of ET was used.

2.6.1.1.4 Precipitation (P)

The timing of data collection was targeted, to the extent possible, to not occur during precipitation events. This planning successfully avoided data collection for stream reach water budgets during precipitation events, so direct precipitation inflows were equal to zero and did not need to be accounted for in the stream reach water budgets.

If precipitation had occurred during field data collection, it would have been quantified using a similar approach to ET where a representative area over which precipitation occurred would have been calculated and a precipitation raster dataset⁹ would be used to quantify precipitation within this area. Uncertainty also would have been calculated similarly.

2.6.1.1.5 Change in Storage

The timing of data collection was also targeted, to the extent possible, to occur during steady state conditions so that flows and change in storage within the stream reach targeted for data collection are not changing over the course of data collection. This goal minimized potential change in storage within each stream reach during data collection, but change in storage still needed to be estimated due to the

⁹ The precipitation raster dataset used would have likely been the Parameter-elevation Regressions on Independent Slopes Model (PRISM) dataset, developed for the contiguous United States and available from Oregon State University. More information on PRISM (including data access) is available at: <https://prism.oregonstate.edu>

dynamic nature of natural streams and systems and perfectly steady state conditions being unattainable.

The assumption used to estimate the change in storage (ΔS) relies on water-level data from the nearest available stream gage, even when the gage is located upstream or downstream of the specific study reach. This simplification was necessary because no continuous stage data were available within most reaches themselves. However, the magnitude of stage change over the short duration of synoptic measurements—typically two to four hours—is generally very small relative to the overall water budget, and therefore the influence of this assumption on calculated ΔS is minimal. In other words, even though water-level fluctuations at a nearby gage may not perfectly represent the exact change at the measurement reach, the expected error introduced is negligible compared with the scale of the other fluxes being quantified (e.g., stream inflow and outflow). The purpose of including ΔS is to maintain a complete mass balance, while recognizing that its contribution is minor and that this simplification reflects the data limitations present during the study.

Change in storage was estimated by first calculating the surface area of the stream reach available to store water; this was calculated as the average width of the upstream and downstream measurement locations at either end of the stream reach multiplied by the length of the stream reach between measurement locations. The next step was to account for changes in water level within the stream reach that would result in a change in storage over the period of data collection. This was determined using water level data from the nearest permanent stream gage on the same stream as the stream reach for which data were being collected. In some cases, the stream gage was located within the stream reach of interest, but in most cases it was either directly upstream or downstream from the stream reach along the same stream and water level changes in that location were used as a proxy for the stream reach. The change in water level was then multiplied by the surface area to calculate a total volume change, and divided by the time between the upstream and downstream flow measurements to convert this to a volumetric flow rate, or flux. Equation 5 below, as described above, was used to calculate the change in storage flux for stream reach water budgets.

Equation 5. Change in storage flux equation.

$$\Delta S = \frac{\Delta h * w * l}{t}$$

Where:

- ΔS = change in storage (CFS)
- Δh = change in water level height from a stream gage
- w = average stream width based on the upstream and downstream measurement width
- l = stream length between the upstream and downstream measurement location
- t = time in between the upstream and downstream measurement

Regarding uncertainty in estimating change in storage, similar to ET, there are multiple sources of uncertainty for change in storage including estimated surface area for the reach (average stream reach width and reach length), the change in water level, and the time over which changes in water level occur. A 0.02 FT absolute uncertainty was assumed for the change in water level height detected by the stream gages; this accounts for a 0.01 FT uncertainty for the starting and ending measurement of water level. Since the average width at the upstream and downstream location was averaged and used across

the entire stream length, a 20% relative uncertainty was assumed for the width. An assumed 5% relative uncertainty was used for stream length, since upstream and downstream ends of the reach are more precisely located. Finally, a two-minute absolute uncertainty was used for the time component since the timing of flow measurements was tracked and reported on a one-minute timestep.

2.6.1.1.6 Net Stream Gain (NSG)

As described above and defined in Equation 3, Net Stream Gain (NSG) was calculated as the closure term of the stream reach water budgets after independently measuring or estimating every other flow path in the water budgets, as described in subsections above. The stream reach water budgets were designed to solve for this flow path, since it is critical to understand to manage DISW under SGMA and an impossible flow path to directly measure.

The uncertainty in quantifying NSG as the closure term of the water budget is influenced by the uncertainty in measuring or estimating every other flow path in the water budget. If the quantification of every other flow path had relatively lower uncertainty, the relatively low uncertainty would propagate through and result in a relatively lower uncertainty in NSG than if every other flow path had relatively higher uncertainty. The law of the propagation of uncertainties (NIST, 1994) was utilized to calculate the uncertainty in quantification of NSG. Equation 6 below depicts the equation to calculate uncertainty for an unmeasured parameter y based on the uncertainties associated with related parameters x_i through x_N . In Equation 6, the second (covariance) term drops out because the contributing parameters are assumed to be statistically independent. Under this assumption, the covariance between any pair of variables x_i and x_j is zero, and the uncertainty can be expressed solely as the sum of the individual variance terms. Equation 7 depicts this equation for NSG based on the uncertainties of every other flow path within the stream reach water budgets. NSG is defined as a linear combination of contributing flow components, each with a unit coefficient. As a result, the partial derivative of NSG with respect to each component equals 1, causing the derivative terms to drop out and leaving the total NSG uncertainty as the sum of the individual component variances.

Equation 6. Law of propagation of uncertainties (NIST, 1994).

$$u_c^2(y) = \sum_{i=1}^N \left(\frac{\partial f}{\partial x_i} \right)^2 u^2(x_i) + 2 \sum_{i=1}^{N-1} \sum_{j=i+1}^N \frac{\partial f}{\partial x_i} \frac{\partial f}{\partial x_j} u(x_i, x_j)$$

Equation 7. Calculation of uncertainty in Net Stream Gain (NSG) based on law of propagation of uncertainties (NIST, 1994).

$$u_{NSG}^2 = u_{SI}^2 + u_{SO}^2 + u_{MI}^2 + u_{MO}^2 + u_{ET}^2 + u_P^2 + u_{\Delta S}^2$$

2.6.2 Data Processing

In order to review, QA/QC, process, and organize the data required for stream reach water budgets, a number of automated python scripting processes were developed and utilized on coordination with some manual data review and organization to produce water budget results. SI, SO, MI, and MO were processed and organized as described in the sections above for each measurement day and reach. Separate python scripts were created to estimate ET and change in storage for each measurement day and reach. After all input data for stream reach water budgets were organized and available, a final python script was developed to combine all stream reach water budget components, calculate NSG, and calculate the uncertainties associated with each flow path. The python scripts were also developed to

create data summaries and visualizations that are included in the following Results and Discussion section.

2.7 Analysis of Cropping Patterns

Land use at various distances from Stony Creek and Thomes Creek (i.e., one to five kilometers on either side of creek at one kilometer increments) were identified using the most recent and reliable spatial land use data in the region, including:

1. Statewide crop mapping, available from the California Department of Water Resources (DWR) (DWR, 2025)
2. CropScape Cropland Data Layer coverage, available from the United States Department of Agriculture (USDA, 2025).

Land use data from these sources were compiled into 30 m x 30 m raster coverages with the Subbasin. DWR data, which includes extensive ground-truthing review of results, is preferentially used to identify agricultural land (including irrigated and non-irrigated lands) and urban areas, and then USDA data is utilized to back-fill gaps of non-irrigated, idled, and non-developed land in the Subbasin. Local refinements are also applied, as needed, to account for local land use information.

These land use data sources and applications were similar to those used in development of the GSP water budgets. Comparisons were made to evaluate the consistency of the datasets and with earlier land use analyses; good correspondence was found for the major land use classes found in the Subbasin.

DWR data is typically available in provisional form approximately two years after a given year has passed. USDA data is typically available for the prior year in early- to mid-February. When data for the current reporting year is not yet available, raster coverages of the Subbasin are generally assembled utilizing land use data from the most recent, hydrologically similar year (i.e., similar water supply conditions and similar cropping patterns, to the extent possible). Idling of annual and ponded crops in a given year may also be locally refined through comparison with USDA data for the current reporting year or through an analysis of vegetation coverage in the current reporting year.

These pixel-based land use data were aggregated by buffered polygons at various distances, summarized using zonal statistics, and presented in both map-based and tabular formats. Irrigated areas and associated statistics for various stream reaches were determined by buffering the stream reach out by up to five kilometers and analyzing the land uses within this buffered region. Therefore, some areas between reaches are double counted, and the areas should not be summed across stream reaches to obtain cumulative values. Rather, cumulative values can be obtained from the associated map figures.

3 Results and Discussion

3.1 Stream Reach Water Budget

3.1.1 Stony Creek

3.1.1.1 *Overview of Streamflow Measurements*

Flows varied substantially across the three sampling dates, ranging from approximately 90 CFS to 147 CFS at STCK02, with uncertainty values increasing under higher velocities and more irregular channel conditions. Moving downstream, decreases in discharge were consistently observed at STCK05, suggesting cumulative losses and potential seepage to groundwater along the lower Stony Creek corridor.

These streamflow data provide critical insight into late-summer hydrologic conditions and the degree of stream–aquifer connectivity along Stony Creek, complementing the Thomes Creek dataset and improving the Subbasin’s empirical foundation for ISW analysis.

3.1.1.2 *Flow Measurement Summary*

Table 2 provides a full summary of discharge measurements, relative uncertainties, and water surface elevations for each measurement date and location. Streamflow magnitudes showed moderate seasonal variability across the late-summer measurement window. The lowest flows were measured on August 22, followed by an increase in discharge on August 27, likely influenced by upstream operational changes or short-term flow releases. By September 12, flows had declined from late-August but remained higher than the initial August 22 measurements.

Uncertainty values were lowest at mid-reach stations (STCK03 and STCK04), where well-defined cross-sections and steady velocities produced more certain velocity-area measurements. Higher uncertainty at STCK02 reflected the more complex hydraulic conditions downstream of the North Diversion Dam. As expected, water surface elevations generally increased at sites as flow increased, and vice versa.

These data provide a robust foundation for constructing reach-scale water budgets and calculating Net Stream Gain (NSG) along the three Stony Creek reaches analyzed. Depending on the stream reach, these measurements serve as either the stream inflow, stream outflow, or both (i.e., for intermediate measurements at STCK03 and STCK04).

Table 2. Synoptic flow measurements for Stony Creek collected across three survey dates in August and September 2025 show consistent upstream-to-downstream flow declines, with the largest reductions occurring between STCK04 and STCK05. Elevations represent water surface elevations in feet above mean sea level (FT AMSL) in the North American Vertical Datum of 1988 (NAVD 88).

Site ID	Site Name	Date	Flow (CFS)	Uncertainty (%)	Elevation (FT AMSL) (NAVD 88)
STCK02	Stony Creek Downstream of North Diversion Dam	2025-08-22	90.1	5.9%	311.37
STCK03	Stony Creek Upstream of I5	2025-08-22	77.0	2.8%	264.02
STCK04	Stony Creek at Hwy 32	2025-08-22	85.7	1.7%	177.35
STCK05	Stony Creek Upstream of GCID Siphon	2025-08-22	52.8	3.3%	133.84
STCK02	Stony Creek Downstream of North Diversion Dam	2025-08-27	146.7	7.0%	311.52
STCK03	Stony Creek Upstream of I5	2025-08-27	131.8	2.3%	264.25
STSP06	Orland Unit WUA South Diversion Spill Near Hwy 32 and Co Rd Q	2025-08-27	28.7	2.2%	
STCK04	Stony Creek at Hwy 32	2025-08-27	139.8	1.3%	177.62
STCK05	Stony Creek Upstream of GCID Siphon	2025-08-27	86.7	2.0%	134.16
STCK02	Stony Creek Downstream of North Diversion Dam	2025-09-12	113.0	2.4%	311.47
STCK03	Stony Creek Upstream of I5	2025-09-12	111.7	3.0%	264.05
STSP06	Orland Unit WUA South Diversion Spill Near Hwy 32 and Co Rd Q	2025-09-12	14.4	2.4%	
STCK04	Stony Creek at Hwy 32	2025-09-12	111.3	2.0%	177.64
STCK05	Stony Creek Upstream of GCID Siphon	2025-09-12	72.7	2.7%	134.13

3.1.1.3 Stream Reach Water Budget Results

The stream-reach water budget results quantify inflows, outflows, and NSG for three distinct reaches along Stony Creek. Each reach length reflects the mapped distance from the national hydrography dataset between measurement locations:

- STCK02-STCK03: 4.4 miles (23,228 FT)
- STCK03-STCK04: 7.9 miles (41,649 FT)
- STCK04-STCK05: 6.2 miles (32,843 FT)

NSG represents the residual term in the water budget after accounting for all measurable surface-water inputs and outputs, with negative NSG values indicating losses from the stream to the aquifer and positive NSG values indicating groundwater discharge to the stream (Table 3). Figure 8 illustrates the spatial configuration of monitoring sites, NSG values for each monitoring date, and the associated 95 % confidence interval. NSG values are shown as a vertical orange line and are plotted on a horizontal axis representing NSG with negative values representing a losing reach and positive representing a gaining reach, and each measurement date is represented on the vertical axis. The shaded blue regions on either side of the NSG value represent the range of values that we are 95% confident the actual NSG would fall within.

Based on measurements performed in August and September 2025, Stony Creek from STCK02 to STCK05 showed losses ranging from -29.2 to -82.3 CFS (i.e., -1.6 to -4.4 CFS per mile; Table 3). Importantly, the uncertainty for these measurements was considerably smaller than the NSG estimates themselves, meaning that we are confident in the numerical NSG results. Based on observations from STCK04 to STCK05, the majority of losses appeared to be from this lower reach (i.e., -29.7 to -50.6 CFS or -4.8 to -8.2 CFS per mile). Stony Creek showed predominantly losing conditions, with reach-specific NSG values ranging from -9 CFS to -50 CFS, except for one near-zero result at STCK02–STCK03 on September 12.

Mid-reach spill inflows from the Orland Unit WUA (STSP06) contributed significant surface-water miscellaneous inflows during the August 27 and September 12 events, impacting the water budget and the resulting NSG in the central and downstream reaches. Overall, Stony Creek displayed greater flow variability, higher mid-reach operational influence, and stronger cumulative losses than most Thomes Creek reaches, reflecting the more engineered and managed nature of the Stony Creek system in late summer.

Table 3. Net Stream Gain by reach and measurement date for Stony Creek. Positive values indicate gaining conditions; negative values indicate losing conditions. Values shown are in cubic feet per second (CFS) and are presented as calculated Net Stream Gain $\pm$ total uncertainty, which incorporates uncertainty associated with discharge measurements, estimated changes in stream storage, miscellaneous inflows and outflows, and evapotranspiration.

Reach	Monitoring Date and Net Stream Gain (CFS) for each Reach			Interpretation
	Aug 22, 2025	Aug 27, 2025	Sep 12, 2025	
STCK02-STCK05 (Combined)	-29.2 $\pm$ 8.4	-82.3 $\pm$ 12.1	-48.5 $\pm$ 7.5	Strongly losing
STCK02-STCK03 (Upstream)	-11.1 $\pm$ 6.4	-13.3 $\pm$ 11.3	+0.1 $\pm$ 5.0	Losing with occasional near-neutral conditions
STCK03-STCK04 (Midstream)	-9.9 $\pm$ 4.1	-18.4 $\pm$ 5.4	-12.6 $\pm$ 6.5	Losing
STCK04-STCK05 (Downstream)	-29.7 $\pm$ 5.2	-50.6 $\pm$ 4.1	-36.1 $\pm$ 4.7	Strongly losing

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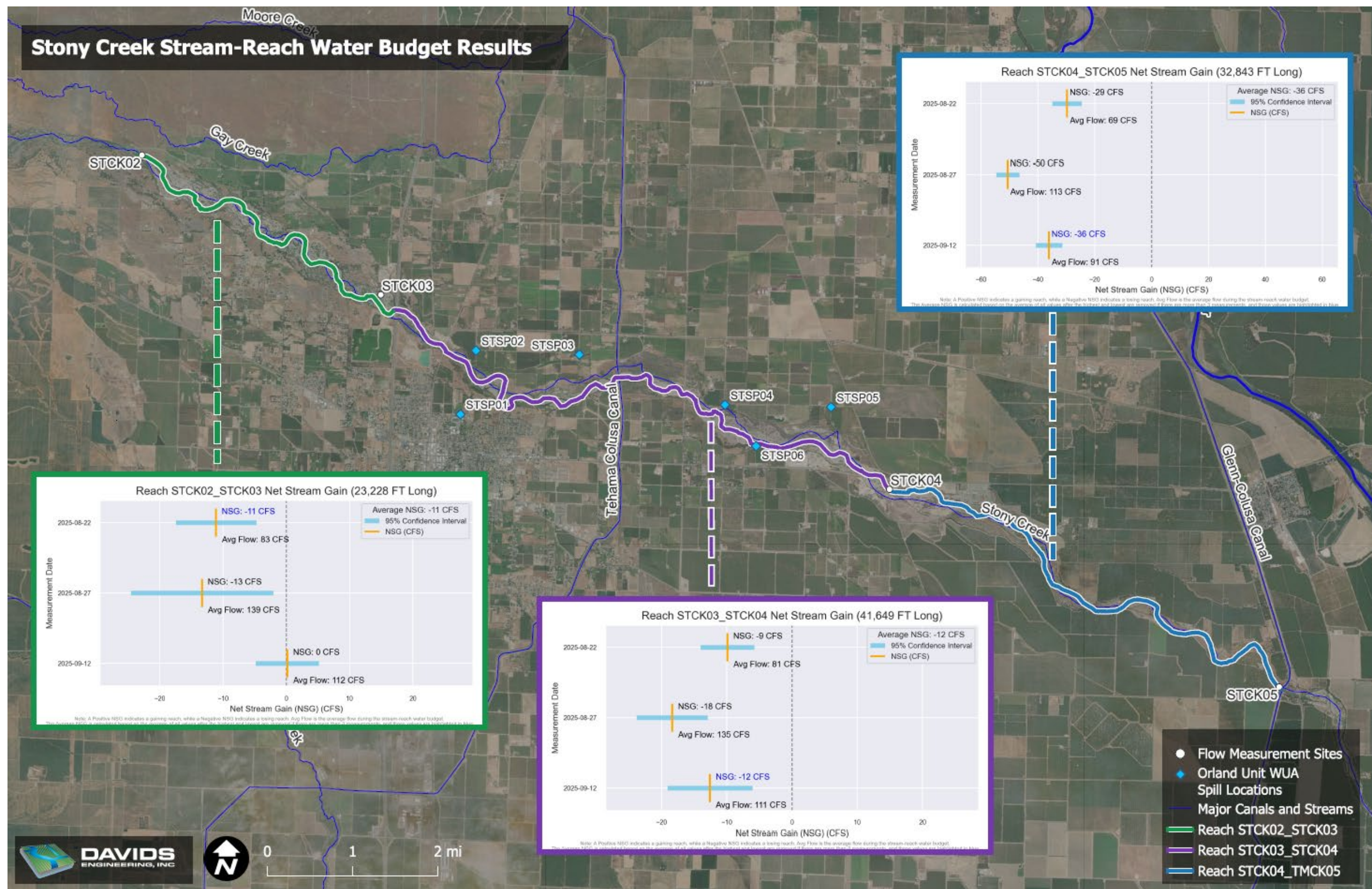


Figure 8. Net stream gains and their uncertainty calculated for the three Stony Creek reaches show increasing losses in STCK02–STCK03 and STCK03–STCK04 going west-to-east, followed by a substantial net loss in STCK04–STCK05. The downstream reach exhibits the largest reduction in flow, indicating significantly greater channel losses relative to the upstream reaches.

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3.1.1.3.1 Combined Reach STCK02 to STCK05

The combined STCK02–STCK05 reach integrates stream behavior across the full 18.5-mile study segment on Stony Creek. Integrating the entire set of measured reaches provides an overall perspective on longitudinal stream–aquifer exchange across a substantial portion of the watershed. Based on three measurements from the late summer 2025 detailed below, the average NSG was -60.5 CFS (ranging from -29.2 to -82.3 CFS). Normalizing by length, this suggests an average losing rate of approximately - 3.3 CFS per mile (ranging from -1.6 to -4.4 CFS per mile). The stream reach water budget results are also summarized in Table 4.

August 22, 2025

- NSG = -50.8 CFS $\pm$ 8.4 CFS, indicating substantial cumulative losses along the full reach.
- Inflow at STCK02 was 90.1 CFS; outflow at STCK05 was 52.8 CFS.
- Mid-reach inflow was unmeasured because landowner access to primary spill site STSP06 had not yet been secured
- Losses were distributed along the corridor, consistent with late-summer recession flows.

August 27, 2025

- NSG = -82.3 CFS $\pm$ 12.1 CFS, the largest magnitude loss observed in the Stony Creek dataset.
- A major mid-reach inflow (MI = 28.7 CFS) from the Orland Unit WUA spill strongly altered the water budget.
- Despite an inflow of 146.7 CFS at STCK02, outflow at STCK05 was only 86.7 CFS, indicating major seepage or channel-loss processes.

September 12, 2025

- NSG = -48.5 CFS $\pm$ 7.5 CFS, again showing strong losing behavior despite decreased inflows.
- Mid-reach operational inflow (14.4 CFS) contributed to changes in flow routing and mass balance.

Table 4. Reach-scale water budgets for Stony Creek for the combined reach from STCK02 to STCK05 on three late-season sampling dates in 2025. NSG is negative on all dates, indicating consistent losses.

Reach ID	Date	Flowpath	Description	Value (CFS)	Uncertainty (CFS)
STCK02_STCK05	2025-08-22	P	inflow	+0.0	$\pm$ 0.0
		SI	inflow	+90.1	$\pm$ 5.3
		MI	inflow	+21.6	$\pm$ 0.5
		NSG	inflow	-50.8	$\pm$8.4
		ET	outflow	-8.1	$\pm$ 2.4
		SO	outflow	-52.8	$\pm$ 1.8
		MO	outflow	-0.0	$\pm$ 0.0
		Δ S	storage	-0.0	$\pm$ 5.8
		Total	balance	0	
STCK02_STCK05	2025-08-27	P	inflow	+0.0	$\pm$ 0.0
		SI	inflow	+146.7	$\pm$ 10.3
		MI	inflow	+28.7	$\pm$ 0.6
		NSG	Inflow	-82.3	$\pm$12.1

Reach ID	Date	Flowpath	Description	Value (CFS)	Uncertainty (CFS)
		ET	outflow	-6.5	±1.9
		SO	Outflow	-86.7	±1.7
		MO	Outflow	-0.0	±0.0
		ΔS	Storage	-0.0	±5.9
		Total	balance	0	
STCK02_STCK05	2025-09-12	P	inflow	+0.0	±0.0
		SI	inflow	+113.0	±2.7
		MI	Inflow	+14.4	±0.3
		NSG	Inflow	-48.5	±7.5
		ET	Outflow	-6.1	±1.8
		SO	Outflow	-72.7	±2.0
		MO	Outflow	-0.0	±0.0
		ΔS	Storage	-0.0	±6.5
		Total	Balance	0	

3.1.1.3.2 STCK02 to STCK03

Overall, STCK02 to STCK03 is typically a losing reach, with occasional near-neutral conditions. Based on three measurements from the late summer 2025 detailed below, the average NSG was -8.1 CFS (ranging from -13.3 to 0.1 CFS). Normalizing by length (4.4 miles), this suggests an average losing rate of approximately -1.8 CFS per mile (ranging from -3.0 to 0.0 CFS per mile). The stream reach water budget results are also summarized in Table 5.

August 22, 2025

- NSG = -11.1 CFS ± 6.4 CFS, indicating measurable seepage loss along the upper reach.
- Outflow at STCK03 (77.0 CFS) was significantly lower than inflow at STCK02 (90.1 CFS).

August 27, 2025

- NSG = -13.3 CFS ± 11.3 CFS, similar in magnitude to August 22, but less certain because of the increased stream inflows and outflows.
- Mid-reach spill had not yet entered the system at this point, so conditions represent “natural + operational baseflow.”

September 12, 2025

- NSG = +0.1 CFS ± 5.0 CFS, effectively zero within uncertainty.
- This suggests the reach may function as near-balanced or weakly gaining under slightly higher groundwater levels or reduced channel infiltration rates.

Table 5. Reach-scale water budgets for upper reach of Stony Creek (STCK02-STCK03) on three late-season sampling dates in 2025 show relatively small net stream gains or losses, with overall flows remaining largely stable through the reach.

Reach ID	Date	Flowpath	Description	Value (CFS)	Uncertainty (CFS)
STCK02_STCK03	2025-08-22	P	inflow	+0.0	±0.0
		SI	inflow	+90.1	±5.3
		MI	inflow	+0.0	±0.0
		NSG	inflow	-11.1	±6.4
		ET	outflow	-2.0	±1.0
		SO	outflow	-77.0	±2.2
		MO	outflow	-0.0	±0.0
		ΔS	storage	-0.0	±2.6
		Total	balance	0	
STCK02_STCK03	2025-08-27	P	inflow	+0.0	±0.0
		SI	inflow	+146.7	±10.3
		MI	inflow	+0.0	±0.0
		NSG	inflow	-13.3	±11.3
		ET	outflow	-1.7	±0.8
		SO	outflow	-131.8	±3.1
		MO	outflow	-0.0	±0.0
		ΔS	storage	-0.0	±3.3
		Total	balance	0	
STCK02_STCK03	2025-09-12	P	inflow	+0.0	±0.0
		SI	inflow	+113.0	±2.7
		MI	inflow	+0.0	±0.0
		NSG	inflow	+0.1	±5.0
		ET	outflow	+1.4	±0.7
		SO	outflow	-111.7	±3.4
		MO	outflow	-0.0	±0.0
		ΔS	storage	-0.0	±2.4
		Total	balance	0	

3.1.1.3.3 STCK03 to STCK04

This reach captures the influence of the Orland Unit WUA South Diversion Spill (STSP06) and is a consistently losing segment, with losses partially masked by miscellaneous inflows from operational spills and tailwater from Orland Unit WUA. Based on three measurements from the late summer 2025 detailed below, the average NSG was -13.6 CFS (ranging from -9.9 to -18.4 CFS). Normalizing by length (7.9 miles), this suggests an average losing rate of approximately -1.7 CFS per mile (ranging from -1.3 to -2.3 CFS per mile). The stream reach water budget results are also summarized in Table 6.

August 22, 2025

- NSG = -9.9 CFS $\pm$ 4.1 CFS, indicating sustained seepage loss despite mid-reach inflow of 21.6 CFS.
- Outflow at STCK04 (85.7 CFS) exceeded upstream flow (77.0 CFS), due entirely to the spill inflow.

August 27, 2025

- NSG = -18.4 CFS $\pm$ 5.4 CFS, the largest loss magnitude for this reach.
- Mid-reach inflow again increased total flow, but seepage outweighed added surface water.

September 12, 2025

- NSG = -12.6 CFS $\pm$ 6.5 CFS, consistent with August results.
- Moderate spill inflow (14.4 CFS) offset some but not all seepage loss.

Table 6. Reach-scale water budgets for the middle reach of Stony Creek (STCK03–STCK04) on three late-season sampling dates in 2025 show modest net stream losses, with negative NSG values observed on all dates.

Reach ID	Date	Flowpath	Description	Value (CFS)	Uncertainty (CFS)
STCK03_STCK04	2025-08-22	P	inflow	+0.0	$\pm$ 0.0
		SI	inflow	+77.0	$\pm$ 2.2
		MI	inflow	+21.6	$\pm$ 0.5
		NSG	inflow	-9.9	$\pm$4.1
		ET	outflow	-2.9	$\pm$ 1.5
		SO	outflow	-85.7	$\pm$ 1.4
		MO	outflow	-0.0	$\pm$ 0.0
		Δ S	storage	-0.0	$\pm$ 2.8
		Total	balance	0	
STCK03_STCK04	2025-08-27	P	inflow	+0.0	$\pm$ 0.0
		SI	inflow	+131.8	$\pm$ 3.1
		MI	inflow	+28.7	$\pm$ 0.6
		NSG	inflow	-18.4	$\pm$5.4
		ET	outflow	-2.4	$\pm$ 1.2
		SO	outflow	-139.8	$\pm$ 1.9
		MO	outflow	-0.0	$\pm$ 0.0
		Δ S	storage	-0.0	$\pm$ 3.9
		Total	balance	0	

Reach ID	Date	Flowpath	Description	Value (CFS)	Uncertainty (CFS)
STCK03_STCK04	2025-09-12	P	inflow	+0.0	±0.0
		SI	inflow	+111.7	±3.4
		MI	inflow	+14.4	±0.3
		NSG	inflow	-12.6	±6.5
		ET	outflow	-2.2	±1.1
		SO	outflow	-111.3	±2.2
		MO	outflow	-0.0	±0.0
		ΔS	storage	-0.0	±5.0
		Total	balance	0	

3.1.1.3.4 STCK04 to STCK05

STCK04 to STCK05 was the most strongly losing reach of Stony Creek. Based on three measurements from the late summer 2025 detailed below, the average NSG was -38.8 CFS (ranging from -29.7 to -50.6 CFS). Normalizing by length (6.2 miles), this suggests an average losing rate of approximately -6.3 CFS per mile (ranging from -4.8 to -8.2 CFS per mile). The stream reach water budget results are also summarized in Table 7.

August 22, 2025

- NSG = -29.7 CFS ± 5.2 CFS, indicating substantial seepage loss across the 6.2-mile reach.
- Flow decreased from 85.7 CFS at STCK04 to 52.8 CFS at STCK05, representing a significant proportion of total discharge for this date.

August 27, 2025

- NSG = -50.6 CFS ± 4.1 CFS, the largest single-reach loss measured along Stony Creek during the Study.
- Despite a large upstream inflow (139.8 CFS), outflow was only 86.7 CFS, indicating high losses over the reach of approximately 8 CFS per mile.
- The greater stream losses on August 27 relative to August 22 and September 12 covaried with increases in overall streamflow and suggest that the magnitude of losses was at least partially proportional to streamflow for this reach.

September 12, 2025

- NSG = -36.1 CFS ± 4.7 CFS, again confirming strong losing behavior across all conditions.

Table 7. Reach-scale water budgets for the lower reach of Stony Creek (STCK04–STCK05) on three late-season sampling dates in 2025 show consistently large net stream losses, with substantial negative NSG values indicating the greatest flow depletion among the study reaches.

Reach ID	Date	Flowpath	Description	Value (CFS)	Uncertainty (CFS)
STCK04_STCK05	2025-08-22	P	inflow	+0.0	±0.0
		SI	inflow	+85.7	±1.4
		MI	inflow	+0.0	±0.0
		NSG	inflow	-29.7	±5.2
		ET	outflow	-3.2	±1.6
		SO	outflow	-52.8	±1.8
		MO	outflow	-0.0	±0.0
		ΔS	storage	-0.0	±4.4
		Total	balance	0	
STCK04_STCK05	2025-08-27	P	inflow	+0.0	±0.0
		SI	inflow	+139.8	±1.9
		MI	inflow	+0.0	±0.0
		NSG	inflow	-50.6	±4.1
		ET	outflow	-2.5	±1.3
		SO	outflow	-86.7	±1.7
		MO	outflow	-0.0	±0.0
		ΔS	storage	-0.0	±2.9
		Total	balance	0	
STCK04_STCK05	2025-09-12	P	inflow	+0.0	±0.0
		SI	inflow	+111.3	±2.2
		MI	inflow	+0.0	±0.0
		NSG	inflow	-36.1	±4.7
		ET	outflow	-2.5	±1.3
		SO	outflow	-72.7	±2.0
		MO	outflow	-0.0	±0.0
		ΔS	storage	-0.0	±3.4
		Total	balance	0	

3.1.2 Thomes Creek

3.1.2.1 Overview of Streamflow Measurements

Measurements were collected during multiple hydrologic conditions—late spring, late summer, and during high-flow snowmelt runoff—to capture a wide range of flow regimes and enable evaluation of seasonal transitions between gaining, losing, and potentially disconnected reaches.

Discharge measurements were completed using a combination of FlowTracker2 ADV during low- to moderate-flow conditions, and a RiverSurveyor ADCP during high flows when channel width and depth

required boat-mounted measurement techniques. All measurements followed USGS-based standard methods, including systematic velocity-area transects and site-specific evaluation of channel geometry, edge conditions, and flow stability. Measurement uncertainty was calculated following manufacturer guidance and industry practice.

The measurement campaign documented substantial seasonal variability across the monitored reaches. Flow conditions ranged from dry channel segments in late summer—where Thomes Creek exhibited discontinuous flow between TMCK02 and TMCK04—to high flows exceeding 200 CFS during May snowmelt conditions. This seasonal contrast provides valuable information regarding the timing and extent of surface-water connectivity along the monitored reaches and supports interpretation of groundwater–surface water exchange dynamics.

3.1.2.2 Flow Measurement Summary

Table 8 summarizes all discharge measurements collected during the Study, including measured flows and associated uncertainties. Flow magnitudes varied considerably across seasons, with the lowest flows observed in August 2025, when portions of Thomes Creek went dry between TMCK02 and TMCK04. The highest flows were observed in May 2025, when snowmelt runoff generated wide, fast-moving channels requiring ADCP measurements.

Uncertainty levels remained low for FlowTracker2 measurements conducted under moderate and low-flow conditions, with relative uncertainty consistently below 4%. ADCP measurements collected during the highest flows demonstrated uncertainties ranging from good to fair (4–7%), consistent with expected performance under dynamic hydraulic conditions, increased turbulence, and larger cross-sections.

Table 8. Flow measurements along Thomes Creek during Study. Flow measurements taken on 2025-05-09 were completed using the RiverSurveyor ADCP and represent the measurements with the greatest uncertainty.

Site ID	Site Name	Date	Flow (CFS)	Uncertainty (%)	Elevation (FT AMSL) (NAVD 88) ¹⁰
TMCK01	Thomes Creek near Paskenta	2024-06-20	60.4	2.3%	
TMCK02	Thomes Creek Downstream of Corning Rd	2024-06-20	55.6	2.3%	
TMCK05	Thomes Creek at Rawson Rd	2024-06-20	35.5	2.5%	
TMCK06	Thomes Creek at Hall Rd.	2024-06-20	28.3	2.4%	
TMCK01	Thomes Creek near Paskenta	2025-05-09	249.7	4.3%	677.35
TMCK02	Thomes Creek Downstream of Corning Rd	2025-05-09	236.0	4.7%	541.33
TMCK04	Thomes Creek at Simpson Rd.	2025-05-09	235.2	5.5%	412.80
TMCK05	Thomes Creek at Rawson Rd	2025-05-09	235.4	5.9%	291.89
TMCK06	Thomes Creek at Hall Rd.	2025-05-09	211.7	6.9%	197.05
TMCK01	Thomes Creek near Paskenta	2025-08-21	8.3	3.9%	254.02
TMCK02 ¹¹	Thomes Creek Downstream of Corning Rd	2025-08-21	5.9	2.7%	671.93

3.1.2.3 Stream Reach Water Budget Results

The stream-reach water budget analysis quantifies inflows, outflows, and Net Stream Gain (NSG) for defined segments along Thomes Creek during the synoptic measurement events. Each reach length reflects the mapped distance from the national hydrography dataset between measurement locations:

- TMCK01-TMCK02: 5.7 miles (30,134 FT)
- TMCK02-TMCK04: 6.8 miles (36,132 FT)
- TMCK04-TMCK05: 6.7 miles (35,628 FT)
- TMCK05-TMCK06: 6.5 miles (34,271 FT)

NSG represents the residual term in the water budget after accounting for all measurable surface-water inputs and outputs, with negative NSG values indicating losses from the stream to the aquifer and positive NSG values indicating groundwater discharge to the stream (Table 9). Figure 9 illustrates the

¹⁰ Null values for elevation on June 20th, 2024 are due to survey equipment being unavailable during field data collection. Water surface elevations were not recorded and are not available for measurements taken this day.

¹¹ The flow and water surface elevation measurement on this day were taken approximately 0.5 miles downstream of the measurement location previously used. It was confirmed that there are no miscellaneous inflows or outflows over the 0.5 miles, so flow should be roughly equivalent to what would be measured in the previous location. However, the measured water surface elevation is lower due to being further downstream (in addition to being taken at lower flow). The new measurement site was selected based on different monitoring equipment being used (FlowTracker2) and preferable conditions for flow measurement in this location.

spatial configuration of monitoring sites, NSG values for each monitoring date, and the associated 95 % confidence interval. NSG values are shown as a vertical orange line and are plotted on a horizontal axis representing NSG with negative values representing a losing reach and positive representing a gaining reach, and each measurement date is represented on the vertical axis. The shaded blue regions on either side of the NSG value represent the range of values that we are 95 % confident the actual NSG would fall within.

Across the full set of synoptic events, Thomes Creek exhibited a mixture of losing and near-balanced conditions, with the magnitude of losses generally increasing in downstream reaches and under higher-flow (May 2025 versus June 2024) conditions. Seasonal variability was substantial; flows exceeded 200 CFS during the May 2025 snowmelt event, whereas late summer (August 2025) flows dropped below 10 CFS, with the lower reaches going completely dry. NSG uncertainty increased during high-flow ADCP measurements—as expected—yet remained within “good” to “fair” ranges. Together, these results provide a consistent representation of reach-scale interactions along Thomes Creek and a robust dataset for evaluating model-simulated stream–aquifer interactions in C2VSimFG.

Integrating the entire set of measured reaches from TMCK01 to TMCK06 provides an overall perspective on longitudinal stream-aquifer exchange across a substantial portion of the Thomes Creek watershed (Section 3.1.2.3.1). For this integrated reach, the two measurements from the spring of 2024 and 2025 suggest a NSG of -23.6 CFS (Table 9). Normalizing by length, this suggests a losing rate of approximately -0.9 CFS per mile on average along the 25.8 mile reach. The intermediate reaches are largely inconclusive given measurement uncertainty. The downstream reach appears to be a losing segment over a range of flow conditions. Normalizing by length, this suggests a losing rate of approximately -0.9 CFS per mile to -3.3 CFS per mile for June 20, 2024 and May 9, 2025, respectively.

Table 9. Net Stream Gain by reach and measurement date for Thomes Creek. Positive values indicate gaining conditions; negative values indicate losing conditions. Values shown are in cubic feet per second (CFS) and are presented as calculated Net Stream Gain $\pm$ total uncertainty, which incorporates uncertainty associated with discharge measurements, estimated changes in stream storage, miscellaneous inflows and outflows, and evapotranspiration. Null values for specific reaches and dates mean that sufficient data were not available to estimate NSG.

Reach	Monitoring Date and Net Stream Gain (CFS) for each Reach			Interpretation
	June 20, 2024	May 9, 2025 ¹²	Aug 21, 2025	
TMCK01-TMCK06 (Combined)	-23.9 $\pm$ 2.8	-23.2 $\pm$ 22.1		Losing
TMCK01-TMCK02 (Upstream)	-3.0 $\pm$ 2.7	-10.6 $\pm$ 17.7	-0.8 $\pm$ 2.3	Inconclusive; slightly losing with high uncertainty
TMCK02-TMCK04 (Midstream)		+6.6 $\pm$ 17.4		Inconclusive; gaining with high uncertainty
TMCK02-TMCK05 (Combined)	-12 $\pm$ 2.5	+8.7 $\pm$ 18.8		Inconclusive; alternates gaining/losing with high uncertainty
TMCK04-TMCK05 (Midstream)		+2.5 $\pm$ 20.3		Inconclusive; gaining with high uncertainty
TMCK05-TMCK06 (Downstream)	-6.1 $\pm$ 1.3	-21.7 $\pm$ 20.7		Strongly losing

¹² Uncertainty in Net Stream Gain (NSG) estimates on May 9, 2025 is substantially higher than on other measurement dates due to elevated streamflows measured on this day. Under higher flow conditions, individual discharge measurement uncertainties increase and propagate through to the NSG calculation, resulting in larger combined uncertainty values. As NSG is computed as the difference between multiple flow measurements, higher absolute flows amplify propagated uncertainty even where relative measurement uncertainty remains low.

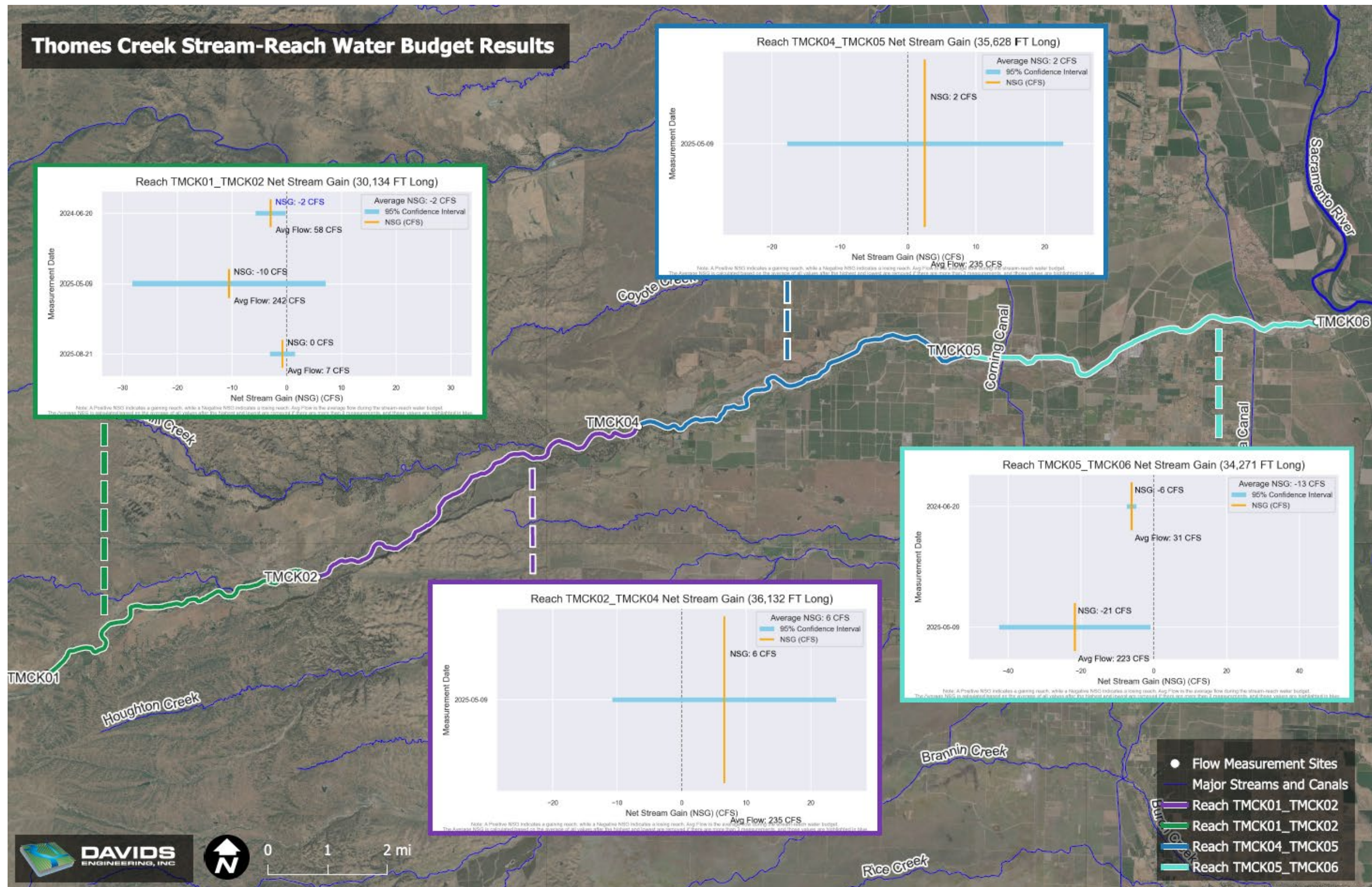


Figure 9. Net stream gains calculated for the four monitored reaches of Thames Creek show relatively small gains or near-neutral conditions in the upper and middle reaches, followed by a pronounced net loss in the downstream reach (TMCK05–TMCK06). The lower reach exhibits the largest reduction in flow, indicating greater channel losses relative to the upstream portions of the creek.

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3.1.2.3.1 Combined Reach: TMCK01 to TMCK06

The combined TMCK01 to TMCK06 reach spans approximately 25.8 miles of Thomes Creek, capturing the full transition from the Coast Range foothills through the lower alluvial valley to the east. Integrating the entire set of measured reaches provides an overall perspective on longitudinal stream-aquifer exchange across a substantial portion of the watershed. Based on two measurements from the spring of 2024 and 2025, the average NSG was -23.6 CFS (ranging from -23.2 to -23.9 CFS). Normalizing by length (25.8 miles), this suggests an average losing rate of approximately -0.9 CFS per mile (ranging from -0.9 to -0.9 CFS per mile). The persistence of losses across varying flow conditions suggests possible partial or full hydraulic disconnection between Thomes Creek and the groundwater system through much of its lower watershed. This potential partial or full disconnection appeared to result in an insensitivity of NSG to changing hydrologic conditions. The stream reach water budget results for TMCK01 to TMCK06 are also summarized in Table 10.

June 20, 2024:

- NSG = -23.9 CFS $\pm$ 2.8 CFS, indicating the overall reach exhibited net losing conditions from the stream to groundwater across the 25.8-mile segment.
- Outflow at TMCK06 (28.3 CFS) was significantly lower than the upstream inflow (60.4 CFS), consistent with progressive downstream losses identified in individual sub-reaches.
- ET and minor outflows were small relative to the total flow budget, and storage change was negligible.

May 9, 2025:

- NSG = -23.2 CFS $\pm$ 22.1 CFS, captured during high snowmelt flows, the combined reach again showed net losing behavior.
- Even under high-flow conditions, outflow (211.7 CFS) was substantially lower than inflow (249.7 CFS).
- ADCP-based discharge measurements of larger flows increased NSG uncertainty, but the losing pattern remained well resolved.

Table 10. Combined reach water budgets for Thomes Creek (TMCK01–TMCK06) from two spring sampling dates in 2024 and 2025 show moderate net stream losses across the full corridor, with consistently negative NSG values and outflows dominated by surface outflow and smaller contributions from evapotranspiration and miscellaneous outflows, the latter representing assumed diversion rates based on reported 2024 monthly diversion volumes from the Thomes Creek Water Users Association.

Reach ID	Date	Flowpath	Description	Value (CFS)	Uncertainty (CFS)
TMCK01_TMCK06	2024-06-20	P	inflow	+0.0	±0.0
		SI	inflow	+60.4	±1.4
		MI	inflow	+0.0	±0.0
		NSG	inflow	-23.9	±2.8
		ET	outflow	-2.9	±1.1
		SO	outflow	-28.3	±0.7
		MO	outflow	-5.2	±1.0
		ΔS	storage	-0.0	±1.8
		Total	balance	0	
TMCK01_TMCK06	2025-05-09	P	inflow	+0.0	±0.0
		SI	inflow	+249.7	±10.7
		MI	inflow	+0.0	±0.0
		NSG	inflow	-23.2	±22.1
		ET	outflow	-10.6	±2.8
		SO	outflow	-211.7	±14.6
		MO	outflow	-4.2	±0.8
		ΔS	Storage	-0.0	±12.3
		Total	Balance	0	

3.1.2.3.2 TMCK01 to TMCK02

This uppermost reach (approximately 5.7 miles long) displayed mildly losing behavior across all measurement dates as seen in Table 11. Based on one measurement from the spring of 2024 and two from 2025, the average NSG was -4.8 CFS (ranging from -0.8 to -10.6 CFS). Normalizing by length (5.7 miles), this suggests an average losing rate of approximately -0.8 CFS per mile (ranging from -0.1 to -1.9 CFS per mile). However, in the case of the 2025 measurements, the 95 % confidence interval includes both negative and positive values, indicating high uncertainty in the actual sign (i.e., gaining or losing) and specific quantity of NSG during these periods. Even the 2024 measurement nearly includes zero with the 95 % confidence interval. Therefore, these results should be considered uncertain. The stream reach water budget results are also summarized in Table 11.

June 20, 2024:

- NSG = -3.0 CFS ± 2.7 CFS, indicating modest but uncertain seepage loss.
- Outflow of 55.6 CFS was ~5 CFS lower than upstream inflow.

May 9, 2025:

- NSG = -10.6 CFS $\pm$ 17.7 CFS, indicating modest but uncertain seepage loss.

August 21, 2025:

- NSG = -0.8 CFS $\pm$ 2.3 CFS, flow was very low (8.3 CFS at the upstream station), so ET and Δ S became proportionally more significant.
- Streamflow remained above zero for the entire reach, even as flows reduced to single-digit CFS.

Table 11. Reach-scale water budgets for the westernmost reach of Thomes Creek (TMCK01–TMCK02) across three 2024–2025 sampling dates show small net stream losses, with NSG values near zero and flow through the reach remaining relatively stable under both spring and late-summer conditions.

Reach ID	Date	Flowpath	Description	Value (CFS)	Uncertainty (CFS)
TMCK01_TMCK02	2024-06-20	P	Inflow	+0.0	$\pm$ 0.0
		SI	Inflow	+60.4	$\pm$ 1.4
		MI	Inflow	+0.0	$\pm$ 0.0
		NSG	Inflow	-3.0	$\pm$2.7
		ET	Outflow	-1.8	$\pm$ 0.9
		SO	Outflow	-55.6	$\pm$ 1.3
		MO	Outflow	-0.0	$\pm$ 0.0
		Δ S	Storage	-0.0	$\pm$ 1.8
		Total	Balance	0	
TMCK01_TMCK02	2025-05-09	P	Inflow	+0.0	$\pm$ 0.0
		SI	Inflow	249.7	$\pm$ 10.7
		MI	Inflow	+0.0	$\pm$ 0.0
		NSG	Inflow	-10.6	$\pm$17.7
		ET	Outflow	-3.1	$\pm$ 1.6
		SO	Outflow	-236.0	$\pm$ 11.1
		MO	Outflow	-0.0	$\pm$ 0.0
		Δ S	Storage	-0.0	$\pm$ 8.5
		Total	Balance	0	
TMCK01_TMCK02	2025-08-21	P	Inflow	+0.0	$\pm$ 0.0
		SI	Inflow	+8.3	$\pm$ 0.3
		MI	Inflow	+0.0	$\pm$ 0.0
		NSG	Inflow	-0.8	$\pm$2.3
		ET	Outflow	-1.6	$\pm$ 0.8
		SO	Outflow	-5.9	$\pm$ 0.2
		MO	Outflow	-0.0	$\pm$ 0.0
		Δ S	Storage	-0.0	$\pm$ 2.1
		Total	Balance	0	

3.1.2.3.3 TMCK02 to TMCK04

The reach from TMCK02 to TMCK04 (approximately 6.8 miles long) was mildly gaining for the single measurement on May 9, 2025 during a high-flow event, as seen in Table 12. Based on one measurement

from the spring of 2025, the average NSG was +6.6 CFS. Normalizing by length (6.8 miles), this suggests a gaining rate of approximately +1.0 CFS per mile. This result should be considered uncertain because the 95 % confidence interval spans from -10.8 CFS to +24.0 CFS. Due to access constraints, this reach was only measured once. The stream reach water budget results are also summarized in Table 12.

May 9, 2025:

- NSG = +6.6 CFS $\pm$ 17.4 CFS, the only reach exhibiting positive NSG during the study, although uncertainty was large as noted above.
- If indeed this gaining result is accurate, this may reflect localized groundwater discharge, subsurface return flows, or geomorphic controls producing temporary gaining behavior.
- Outflow (235.2 CFS) closely matched inflow (236.0 CFS), consistent with slightly gaining conditions, but NSG was small relative to inflows and outflows, so uncertainty is high.

Table 12. Reach-scale water budget for the TMCK02–TMCK04 reach on the May 9, 2025 synoptic sampling date shows a small positive net stream gain, with NSG slightly above zero and outflows dominated by surface outflow along with minor contributions from evapotranspiration and miscellaneous outflows.

Reach ID	Date	Flowpath	Description	Value (CFS)	Uncertainty (CFS)
TMCK02_TMCK04	2025-05-09	P	inflow	+0.0	$\pm$ 0.0
		SI	inflow	+236.0	$\pm$ 11.1
		MI	inflow	+0.0	$\pm$ 0.0
		NSG	inflow	+6.6	$\pm$17.4
		ET	outflow	-3.2	$\pm$ 1.6
		SO	outflow	-235.2	$\pm$ 12.9
		MO	outflow	-4.2	$\pm$ 0.8
		Δ S	storage	-0.0	$\pm$ 2.8
		Total	balance	0	

3.1.2.3.4 Combined Reach: TMCK02 to TMCK05

This multi-segment reach from TMCK02 to TMCK05 integrates approximately 13.6 miles of Thomes Creek and stream reach water budget results are summarized in Table 13. Based on one measurement from the spring of 2024 and one from 2025, the average NSG was -1.7 CFS (ranging from -12.0 to +8.7 CFS). Normalizing by length (13.6 miles), this suggests an average losing rate of approximately -0.1 CFS per mile (ranging from -0.9 to +0.6 CFS per mile). The reach NSG was -12.0 CFS on June 20, 2024 and +8.7 CFS on May 9, 2025, indicating a potentially dynamic or transitional reach that alternates from gaining to losing based on hydrologic conditions. That said, this conclusion should be considered uncertain because the NSG 95 % confidence interval for the May 9, 2025 spans from -10.1 CFS to +27.5 CFS. The stream reach water budget results are also summarized in Table 13.

June 20, 2024:

- NSG = -12.0 CFS $\pm$ 2.5 CFS, indicating substantial net losses along the combined reach with a high level of confidence.
- Outflow (35.5 CFS) was significantly lower than inflow (55.6 CFS).

May 9, 2025:

- NSG = +8.7 CFS $\pm$ 18.8 CFS, indicating modest net gains; however, uncertainty was high, and SO nearly equaled SI.
- If NSG is indeed positive (gaining), this contrasts with the confidently losing finding from June 20, 2024, suggesting a dynamic or transitional reach.

Table 13. Reach-scale water budgets for the central portion of Thomes Creek (TMCK02–TMCK05) from spring 2024 and 2025 sampling dates show moderate net stream losses overall, with negative NSG values on the 2024 date and a small positive NSG on the 2025 date. Outflows are dominated by surface outflow, with additional contributions from evapotranspiration and miscellaneous outflows.

Reach ID	Date	Flowpath	Description	Value (CFS)	Uncertainty (CFS)
TMCK02_TMCK05	2024-06-20	P	inflow	+0.0	$\pm$ 0.0
		SI	inflow	+55.6	$\pm$ 1.3
		MI	inflow	+0.0	$\pm$ 0.0
		NSG	inflow	-12.0	$\pm$2.5
		ET	outflow	-2.9	$\pm$ 1.5
		SO	outflow	-35.5	$\pm$ 0.9
		MO	outflow	-5.2	$\pm$ 1.0
		Δ S	storage	-0.0	$\pm$ 0.7
		Total	balance	0	
TMCK02_TMCK05	2025-05-09	P	inflow	+0.0	$\pm$ 0.0
		SI	inflow	+236.0	$\pm$ 11.1
		MI	inflow	+0.0	$\pm$ 0.0
		NSG	inflow	+8.7	$\pm$18.8
		ET	outflow	-5.1	$\pm$ 2.6
		SO	outflow	-235.4	$\pm$ 13.9
		MO	outflow	-4.2	$\pm$ 0.8
		Δ S	storage	-0.0	$\pm$ 5.6
		Total	balance	0	

3.1.2.3.5 TMCK04 to TMCK05

The reach from TMCK04 to TMCK05 (approximately 6.7 miles long) was mildly gaining for the single measurement on May 9, 2025 (Table 14). Based on this one measurement from the spring of 2025, NSG was +2.5 CFS. Normalizing by length (6.7 miles), this suggests an average gaining rate of approximately +0.4 CFS per mile. Given the uncertainty of this single measurement, it is difficult to conclude if this reach is gaining or losing with any confidence. The stream reach water budget results are also summarized in Table 14.

May 9, 2025:

- NSG = +2.5 CFS $\pm$ 20.3 CFS, a small gain within a high 95 % confidence interval, indicating high uncertainty about gaining or losing conditions.
- Outflow (235.4 CFS) was nearly identical to inflow (235.2 CFS).

Table 14. Reach-scale water budget for the TMCK04–TMCK05 reach on the May 9, 2025 synoptic sampling date shows a small positive net stream gain, with NSG slightly above zero and outflows dominated by surface outflow, accompanied by minor evapotranspiration losses.

Reach ID	Date	Flowpath	Description	Value (CFS)	Uncertainty (CFS)
TMCK04_TMCK05	2025-05-09	P	inflow	+0.0	±0.0
		SI	inflow	+235.2	±12.9
		MI	inflow	+0.0	±0.0
		NSG	inflow	+2.5	±20.3
		ET	outflow	-2.3	±1.1
		SO	outflow	-235.4	±13.9
		MO	outflow	-0.0	±0.0
		ΔS	storage	-0.0	±7.0
		Total	balance	0	

3.1.2.3.6 TMCK05 to TMCK06

This downstream reach includes the lower valley portion of Thomes Creek from TMCK05 to TMCK06 (approximately 6.5 miles in length) and appears to be losing based on the results of the stream reach water budget in Table 15. Based on one measurement from the spring of 2024 and one from 2025, the average NSG was -13.9 CFS (ranging from -6.1 to -21.7 CFS). Normalizing by length (6.5 miles), this suggests an average losing rate of approximately -2.1 CFS per mile (ranging from -0.9 to -3.3 CFS per mile). Based on these results, this reach appears to be a losing segment over a range of flow conditions. The stream reach water budget results are also summarized in Table 15.

June 20, 2024:

- NSG = -6.1 CFS ± 1.3 CFS, confirming clear losing conditions.
- Flow decreased from 35.5 CFS at TMCK05 to 28.3 CFS at TMCK06.
- Losses were proportionally large relative to flow, reflecting a highly transmissive alluvial system.

May 9, 2025:

- NSG = -21.7 CFS ± 20.7 CFS, one of the largest losing signatures in the study.
- Despite high flows, outflow was 211.7 CFS compared to 235.4 CFS at TMCK05.
- However, the 95 % confidence interval suggests uncertainty around the specific NSG value, although we can be confident this reach is losing to some degree.

Table 15. Reach-scale water budgets for the lower reach of Thomes Creek (TMCK05–TMCK06) from spring 2024 and 2025 sampling dates show persistent net stream losses, with negative NSG values on both dates and outflows dominated by surface outflow, accompanied by smaller evapotranspiration losses.

Reach ID	Date	Flowpath	Description	Value (CFS)	Uncertainty (CFS)
TMCK05_TMCK06	2024-06-20	P	inflow	+0.0	±0.0
		SI	inflow	+35.5	±0.9
		MI	inflow	+0.0	±0.0
		NSG	inflow	-6.1	±1.3
		ET	outflow	-1.1	±0.6
		SO	outflow	-28.3	±0.7
		MO	outflow	-0.0	±0.0
		ΔS	storage	-0.0	±0.4
		Total	balance	0	
TMCK05_TMCK06	2025-05-09	P	inflow	+0.0	±0.0
		SI	inflow	+235.4	±13.9
		MI	inflow	+0.0	±0.0
		NSG	inflow	-21.7	±20.7
		ET	outflow	-2.0	±1.0
		SO	outflow	-211.7	±14.6
		MO	outflow	-0.0	±0.0
		ΔS	storage	-0.0	±4.8
		Total	balance	0	

3.2 Analysis of Cropping Patterns

3.2.1 Stony Creek

3.2.1.1 Transition in Cropping Patterns from West to East (Upstream to Downstream)

Land use adjacent to Stony Creek demonstrates a clear transition from predominantly non-orchard agricultural crops in the western (upstream) reaches toward orchard-dominated agriculture in the eastern (downstream) reaches. This trend is reflected both in mapped crop distributions seen in Figure 10 and in the irrigated acreage statistics summarized in Table 16. The Orland Unit Water Users Association service area is depicted in Figure 10 to show lands with surface water diverted from Stony Creek available for irrigation that are not as dependent on groundwater pumping.

Table 16. Summary of land use and irrigated acreage adjacent to Stony Creek by reach. Irrigated areas for the four reaches were determined by buffering the stream reach out by five kilometers and analyzing the land uses within this buffered region. Therefore, areas between reaches are double counted, so the areas should not be summed across reaches to obtain cumulative values. Rather, cumulative values can be obtained from Figure 10. The table illustrates the west-to-east transition from predominantly non-orchard agriculture in the upper reaches (STCK02–STCK03) toward orchard-dominated irrigated lands in the lower reaches (STCK03–STCK04 and STCK04–STCK05). Increasing irrigated acreage and rising orchard percentages toward the east align with the termination of surface-water deliveries near STCK04 and the shift to groundwater-dependent irrigation in the downstream reach.

Reach ID	Total Area (AC)	Total Irrigated Area (AC)	Irrigated Area Percentage of Total Area	Total Orchard Area (AC)	Orchard Area Percentage of Irrigated Area	Total Non-Orchard Ag. Area (AC)	Non-Orchard Ag. Area Percentage of Irrigated Area
STCK02_STCK03	33,804	13,424	40%	6,749	50%	6,675	50%
STCK03_STCK04	45,725	27,499	60%	18,773	68%	8,726	32%
STCK04_STCK05	41,056	28,180	69%	23,287	83%	4,894	17%

Irrigated acreage increases progressively from west to east, rising from 13,424 acres (40%) in Reach STCK02–STCK03, to 27,499 acres (60%) in STCK03–STCK04, and reaching 28,180 acres (69%) in STCK04–STCK05. Concomitantly, the proportion of irrigated farmland planted in permanent orchards increases sharply across these same reaches. Orchards constitute only 50% of irrigated acreage in STCK02–STCK03, increasing to 68% in STCK03–STCK04, and reaching 83% in STCK04–STCK05.

Conversely, non-orchard agriculture (including grains, hay, and row crops) decreases as a share of irrigated land, falling from 50% in the western reach to 17% in the easternmost reach. These changes illustrate a strong eastward shift toward permanent, high-water-demand orchard crops. Figure 9 visually reinforces this pattern, depicting increasing orchard density in the lower portion of the study area near STCK05.

3.2.1.2 Termination of Surface-Water Deliveries West of STCK04

The eastern boundary of the Orland Unit WUA shown in Figure 10, lies immediately west of measurement site STCK04. Lands within this boundary receive surface water deliveries, while irrigated lands east of the boundary do not receive surface water and are therefore dependent on groundwater pumping for irrigation supply.

This boundary alignment results in a distinct shift in irrigation water sources along the creek corridor. Upstream reaches (STCK02–STCK03 and STCK03–STCK04) include irrigated areas supplied by Orland Unit WUA surface water. Beginning near STCK04 and extending through STCK05, irrigated lands must rely exclusively on groundwater to support both permanent orchards and other crop types. This shift from surface water irrigation to groundwater pumping is likely a key factor influencing streamflow behavior in the lower reaches.

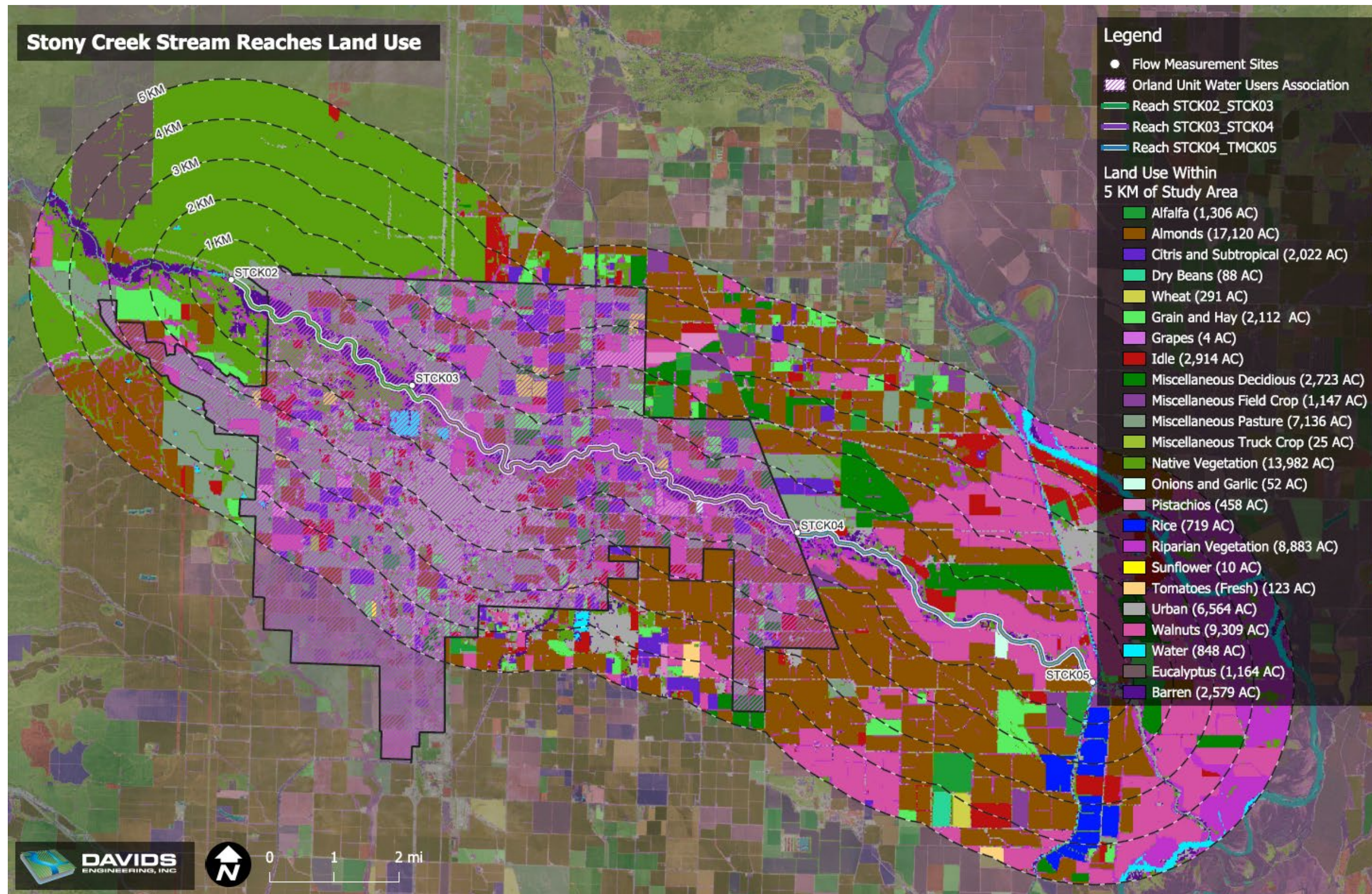


Figure 10. Land use adjacent to Stony Creek shows a transition from native vegetation or non-permanent agricultural crops to permanent tree crops going from west to east. The lower reach from measurement sites STCK04 to STCK05 lies outside the eastern boundary of Orland Unit Water Users Association (WUA). Irrigated lands adjacent to Stony Creek that are not within Orland Unit WUA's boundaries are in white areas without surface water deliveries making them dependent on groundwater for irrigation. The greater losses in stream flow in the lower reach may be attributable to groundwater pumping and may potentially represent a DISW.

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3.2.1.3 *Streamflow Losses in Reach STCK04–STCK05*

The reach STCK04–STCK05 exhibits the largest observed losses in streamflow among the study reaches. This reach also contains the highest irrigated acreage and the greatest percentage of permanent orchard crops. Because these lands lie outside the Orland Unit WUA service area, irrigation demands must be met by groundwater extraction.

Groundwater pumping in close proximity to the creek can induce localized declines in groundwater levels, increasing the hydraulic gradient from the stream toward the aquifer. This process can accelerate seepage losses from the channel, ultimately manifesting as substantial reductions in measured streamflow through the reach.

The concurrence of high orchard densities, large volumes of groundwater-dependent irrigation, and significant measured flow losses supports the interpretation that groundwater pumping is exerting a strong influence on channel losses within this reach.

3.2.2 *Thomes Creek*

3.2.2.1 *Transition in Cropping Patterns from West to East*

Land use within 5 kilometers of Thomes Creek demonstrates a clear transition from predominantly non-orchard agricultural crops in the western reaches toward orchard-dominated agriculture in the central and eastern reaches. This trend is reflected in both the mapped crop distributions shown in Figure 11 and the irrigated acreage statistics summarized in Table 17.

Table 17 shows that irrigated acreage is relatively low in the westernmost reach (TMCK01–TMCK02), where only 4% of the adjacent area is irrigated and orchard crops account for 7% of irrigated acreage. Irrigated acreage increases in the next reach (TMCK02–TMCK04), with orchards representing 49% of irrigated land. Irrigation intensity rises sharply to the east of TMCK04, with irrigated areas accounting for 33% of total land area in TMCK04–TMCK05 and 46% along TMCK05–TMCK06. Orchard crops become increasingly prominent in these downstream reaches, increasing to 86% of irrigated land in TMCK04–TMCK05 and TMCK05–TMCK06.

Figure 11 visually reinforces this pattern with a west-to-east transition from native vegetation or non-orchard row and field crops in the upper watershed to extensive orchard (predominantly almond and walnut) plantings adjacent to the Thomes Creek channel in the downstream reaches.

Overall, these data illustrate a strong eastward shift toward permanent, high-water-demand orchard crops and a substantial increase in irrigated acreage in the lower corridor of Thomes Creek.

3.2.2.2 *Variation in Irrigation Demands and Water Sources Along the Corridor*

In contrast with Stony Creek, the Thomes Creek corridor does not contain a major surface water service district that clearly defines surface water- versus groundwater-dependent irrigated lands, although the Thomes Creek WUA diverts a relatively small volume of water off Thomes Creek between TMCK02 and TMCK04, providing surface water for irrigation to some of lands included in this analysis. The cropping distributions in Figure 11 indicate that orchard development—and therefore irrigation demand—becomes considerably more intensive moving downstream.

The lower reaches (TMCK04–TMCK05 and TMCK05–TMCK06) contain the largest irrigated acreages and the highest density of permanent orchards. Permanent crops require consistent irrigation throughout the growing season, including during periods of low natural streamflow and peak water demand. They also require irrigation during periods of drought when natural streamflow is lower than wetter periods and groundwater pumping is increased. This increased consumptive use has the potential to both reduce streamflow through direct diversions for irrigation and increase groundwater pumping for supplemental irrigation, depending on water supply availability.

3.2.2.3 Streamflow Losses in Downstream Reaches

Reach-scale water budget results show a pattern of increasing streamflow losses in the downstream portions of Thames Creek, corresponding to the areas of highest orchard density.

- The westernmost reach (TMCK01–TMCK02) shows only minor streamflow losses across all sampling dates, indicating relatively stable conditions even during late-summer measurements.
- The central reaches (TMCK02–TMCK05, including TMCK02–TMCK04 and TMCK04–TMCK05) show relatively low net gains or losses depending on season and flow conditions.
- The downstream reach (TMCK05–TMCK06) consistently exhibits the largest negative NSG values during both 2024 and 2025 sampling events, indicating substantial flow depletion relative to upstream reaches.

This spatial pattern—relatively stable flows upstream, moderate losses in the middle, and more pronounced losses downstream—coincides with the distribution of irrigated acreage and orchard crops identified in Table 13.

Table 17. Irrigated land use along Thames Creek shows increasing irrigation intensity and a strong eastward shift toward orchard crops. Irrigated areas for the four reaches were determined by buffering the stream reach out by five kilometers and analyzing the land uses within this buffered region. Therefore, areas between reaches are double counted, so the areas should not be summed across reaches to obtain cumulative values. Rather, cumulative values can be obtained from Figure 11. Irrigated acreage remains low in the upper reach (TMCK01–TMCK02) and is dominated by non-orchard agriculture, but orchard area expands sharply in the middle reaches and becomes the dominant agricultural land use in the lower reach (TMCK05–TMCK06), where orchards account for 86% of irrigated acreage.

Reach ID	Total Area (AC)	Total Irrigated Area (AC)	Irrigated Area Percentage of Total Area	Total Orchard Area (AC)	Orchard Area Percentage of Irrigated Area	Total Non-Orchard Ag. Area (AC)	Non-Orchard Ag. Area Percentage of Irrigated Area
TMCK01_TMCK02	39,510	1,468	4%	102	7%	1,367	93%
TMCK02_TMCK04	44,051	5,196	12%	2,564	49%	2,632	51%
TMCK04_TMCK05	43,352	14,289	33%	12,301	86%	1,988	14%
TMCK05_TMCK06	43,619	20,254	46%	17,331	86%	2,923	14%

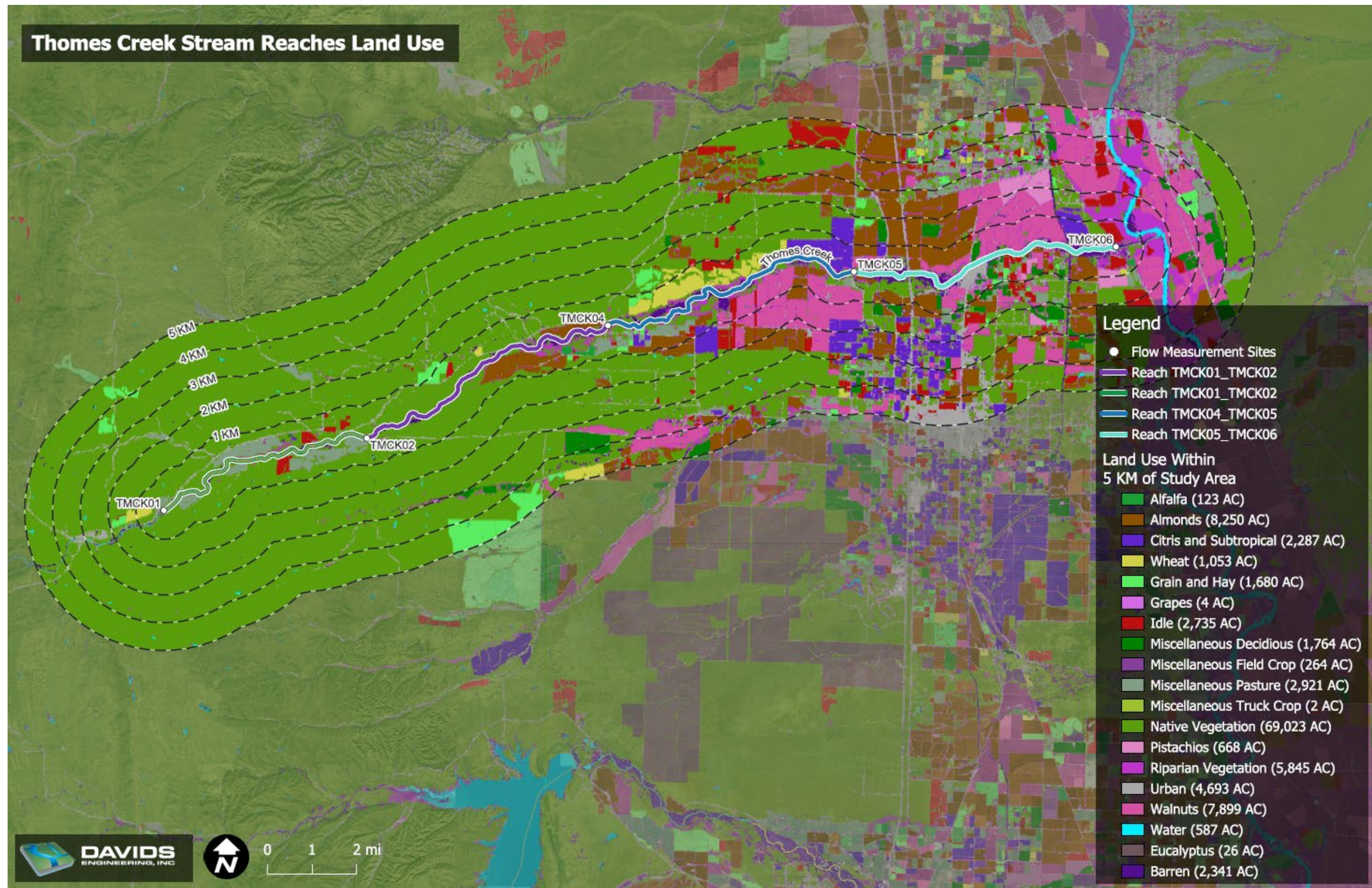


Figure 11. Land use mapping along Thames Creek shows a west-to-east transition from predominantly non-orchard agriculture in the upstream reaches to extensive orchard development in the downstream reaches. Orchard acreage becomes increasingly dominant toward TMCK06, reflecting the eastward intensification of permanent crops adjacent to Thames Creek.

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4 Recommendations

The recommendations stemming from the Study include recommendations within three different categories, as outlined in subsections below. These include recommendations for immediate review and potential refinement of the C2VSimFG or Tehama IHM, for additional field monitoring similar to that done in the Study to further improve understanding of ISW in the Corning Subbasin, and for expansion of the scale and scope of ISW field monitoring not only for the Corning Subbasin, but for the broader Sacramento Valley region.

4.1 Review and Refinement of C2VSimFG or Tehama IHM

4.1.1 Refine Stage-Discharge and Wetted Perimeter Model Inputs

The current groundwater model representation of Stony Creek and Thomes Creek uses simplified and spatially uniform hydraulic parameters and rating relationships along each stream corridor. While appropriate during early model development, these simplifications limit the model's ability to realistically simulate spatial variations in channel geometry and hydraulics, stream–aquifer interactions, and DISW. Refinements to the model's stream inputs are recommended to improve simulation accuracy.

At present, all stream nodes along Stony Creek share a single identical stage–discharge rating table, and all stream nodes along Thomes Creek similarly share a single rating table unique to that creek. Although Stony Creek and Thomes Creek are distinguished from one another, the use of a single rating curve for every node along each creek does not reflect reach-specific hydraulic conditions, such as:

- Changes in channel slope or confinement,
- Differences in channel geometry (width, depth, bank shape),
- Localized erosion or deposition features, and
- Spatial variations in roughness or vegetation.

As a result, the model may inaccurately simulate water-surface elevations, flow routing, and the hydraulic gradients that drive stream–aquifer exchange. After stream gages are installed (Section 4.2.1), the resulting stage records—paired with periodic discharge measurements—could be used to develop improved, reach-specific stage–discharge relationships. Updating the rating tables with spatially varied relationships would allow the groundwater model to more accurately represent changing hydraulic conditions along each creek.

Similarly, the groundwater model currently applies a uniform wetted perimeter to all stream nodes along each creek, with 200 FT assigned to Stony Creek and 250 FT assigned to Thomes Creek. These values represent generalized channel widths and do not account for:

- Narrower upstream canyon reaches,
- Wider alluvial reaches downstream,
- Diversions, levees, or channel modifications,
- Differences in floodplain connectivity.

Because wetted perimeter influences the simulated streambed conductance—and therefore the magnitude of streamflow infiltration or exfiltration—the assumption of a constant value along the entire creek can lead to over- or under-estimation of stream–aquifer exchange in specific reaches.

Updated wetted perimeter estimates should be developed using high-resolution aerial imagery, LiDAR-derived channel geometry, or field measurements collected in coordination with new stream gages. Incorporating spatially variable wetted perimeters into the model would allow for more accurate simulation of hydraulic connection and flow losses, particularly in reaches where DISW is suspected.

4.1.2 Review water budget results against characterization of ISW

The streamflow measurements and stream reach water budgets can also be used as reference points for comparison to modeling results for that specific period of time or a historical time under similar hydrologic conditions to evaluate and, depending on the outcome of the evaluation and other factors, potentially refine model results. This is recommended based on Study results, although results are limited and additional field data collection would be beneficial, as outlined in the following section.

4.2 Enhancements to Support ISW Characterization

The Study only includes a limited dataset on ISW, and the sections below highlight opportunities for additional field data collection related to stream reach water budgets to improve understanding and characterization of ISW.

4.2.1 Additional stream gages and measurements to characterize ISW

To support Corning Subbasin's GSP implementation, LSCE recently installed shallow monitoring wells along Stony Creek, Thomes Creek, and Burch Creek to improve characterization of shallow groundwater conditions in proximity to the stream channels. These wells were specifically sited to observe groundwater levels within the near-stream aquifer to support ongoing evaluation of ISW. The new monitoring network provides a valuable foundation for understanding seasonal groundwater dynamics; however, additional data are needed to directly assess how groundwater elevations relate to stream stage under different hydrologic conditions.

In addition to these shallow groundwater improvements, the Corning Subbasin Groundwater Sustainability Agency (CSGSA)—which represents the Glenn County portion of the Corning Subbasin—is working with the California Stream Gage Improvement Program (CalSIP) to install a new permanent stream gage at the Glenn-Colusa Canal (GCC) siphon on Stony Creek. When paired with the existing long-term USGS gage at Black Butte Reservoir, this new downstream gage will provide greatly improved spatial coverage of continuous streamflow monitoring along Stony Creek. The combination of these two gages, along with any future gages installed near monitoring wells, represents a significant opportunity to develop continuous stream-reach water budgets once stage–discharge relationships are established. This expanded gage network will substantially enhance CSGSA's ability to evaluate seasonal ISW conditions and quantify streamflow depletion dynamics.

To strengthen ISW assessment, installation of continuous stream-stage gages at selected locations along each creek—ideally co-located with, or adjacent to, the shallow monitoring wells—is recommended. Continuous water-surface elevation (WSE) measurements from these gages can be paired directly with groundwater elevations (GWE) recorded in the shallow wells. Coordinated WSE–GWE measurements would enable evaluation of vertical and lateral hydraulic gradients between the stream and the near-stream aquifer, identification of gaining versus losing conditions, and improved interpretation of the timing and magnitude of potential streamflow depletions resulting from groundwater pumping.

In addition to continuous stage monitoring, it would also be beneficial to collect additional streamflow measurements at these gage locations throughout the irrigation season. Periodic direct discharge measurements—particularly during late-spring, mid-summer, and late-summer low-flow conditions—would provide essential calibration points for stage–discharge relationships and would help quantify temporal changes in streamflow magnitude and flow loss rates throughout the spring and summer months. When combined with continuous stage records and shallow groundwater levels, these targeted flow measurements would enable a more complete understanding of how streamflow responds to seasonal groundwater pumping, irrigation practices, and channel conditions and changing stream-aquifer interaction dynamics. Together, these measurements would provide the data necessary to rigorously evaluate the degree of groundwater–surface water connection in the subbasin and improve the characterization of DISW during critical periods.

4.3 Expansion of Scale and Scope ISW Field Monitoring

In addition to the recommendations above focused specifically on review and potential refinement of C2VSimFG, and additional stream-related field data collection and monitoring in the Corning Subbasin, the Study also results in recommendations for expansion of both the scale and scope of ISW monitoring and analyses for both the Corning Subbasin and the broader Sacramento Valley region. These recommendations are presented below, and can be pursued and implemented, dependent on GSA and DWR priorities and available funding and implementation opportunities.

4.3.1 Expansion of Scale of ISW Field Monitoring

As described previously, this initial synoptic stream gaging effort was focused in scope on quantifying stream-aquifer exchanges through stream reach water budgets and was limited in scale to Stony Creek and Thomes Creek with only four and five measurement sites, respectively, identified and included in the Study. Opportunities to expand the scale of this synoptic stream gaging and stream reach water budget approach include:

1. Additional measurement sites and stream reaches along Stony Creek and Thomes Creek
2. Additional measurement sites along other potential ISW streams flowing across the subbasin (e.g., Burch Creek)
3. Additional measurement sites and stream reaches along the Sacramento River, which forms the eastern boundary of the Corning Subbasin and is a surface water feature of regional importance.

The first two items listed above would be supported by implementation of the recommendations described in Section 4.2.

4.3.2 Expansion of Scope of ISW Field Monitoring

The scope of field monitoring and subsequent analyses could also be expanded to improve understanding of ISW and DISW, refine modeling through Corning Subbasin portion of C2VSimFG or Tehama IHM, and improve SGMA implementation and support groundwater sustainability. These expansion opportunities include both an expansion of the current Study to include additional related field data collection to improve characterization of ISW within the model and incorporation of new field data collection efforts and datasets to inform understanding of ISW and potential model refinement.

As noted previously, the current Study provides data limited both spatially and temporally, and continued data collection would increase understanding of ISW on these streams. Additionally, the field data collection could be expanded to include:

1. Surveying stream cross-sections to better understanding and improve simulation of stream stage-wetted perimeter relationships in model, which defines the extent of connection and area of stream-aquifer interaction. As described above, these are currently constant values for Stony Creek and Thomes Creek.
2. Collecting stream stage and flow measurements across the full range of hydrologic conditions to better understand stage-discharge relationship along ISW streams, which are also included within model. As described above, there is currently a single relationship for each stream defined across all stream nodes on Stony Creek and Thomes Creek.
3. Evaluation of stream reach water budgets against model results, as recommended above, and potentially using stream reach water budget results for NSG to calibrate streambed conductivities in the model to more closely align with data measured in the field.

New field data collection efforts that could undertaken to improve understanding of ISW and potential model refinement include:

1. Measurement of stream stage and adjacent shallow groundwater levels to evaluate potential hydraulic connections between groundwater and surface water over space and time and to calculate hydraulic gradients (this recommendation was also previously described in Section 4.2).
2. Water sampling and testing for stable isotopes and radon to evaluate water source and gaining or losing conditions within streams.
3. Biological surveys along streams to evaluate presence of groundwater dependent ecosystems (GDEs) and location of GDEs along riparian corridors as an independent evaluation of where ISW may be present within the subbasin.

Overall, the implementation in part or whole of the recommendations above will improve the understanding of ISW and characterization of ISW through modeling efforts, which will in turn improve modeling of different conditions within the subbasin and management to prevent DISW.

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6 Appendices

6.1 Flow Measurement Reports

6.1.1 Stoney Creek

6.1.1.1 STCK02

QRev Discharge Summary Note

Station Name: STCK02

Site ID: NA

Date: 08/22/2025

Transect Discharge

Total Q (ft³/s): 90.056

Estimated Uncertainty (%): 5.9



File Name	Start Time	End Time	Start Edge	Top Q (ft ³ /s)	Middle Q (ft ³ /s)	Bottom Q (ft ³ /s)	Total Q (ft ³ /s)
03-Transect_20250822093452.mat	9:35:16	9:42:15	Right	12.915	65.56	10.996	89.904
04-Transect_20250822094217.mat	9:42:27	9:45:50	Left	13.184	66.459	11.164	90.958
05-Transect_20250822094553.mat	9:46:23	9:51:17	Right	12.387	63.481	10.358	86.949
06-Transect_20250822095119.mat	9:51:36	9:55:10	Left	13.249	67.571	11.21	92.411
Mean	-	-	-	12.934	65.767	10.932	90.056

Measurement Details

Mean Measurement Depth (ft): 3.634

Maximum Measurement Depth (ft): 4.794

Total Measurement Duration (s): 1130.00

File Name	Mean Temp (°C)	Width (ft)	Area (ft ²)	Mean Boat Speed (ft/s)	Mean V (ft/s)	Invalid Depth Cells (%)	Invalid Ens (%)
03-Transect_20250822093452.mat	25.1	68.469	247.326	0.186	0.364	3	1.2
04-Transect_20250822094217.mat	25.2	67.281	245.974	0.357	0.37	2.9	12.8
05-Transect_20250822094553.mat	25.2	68.036	246.731	0.246	0.352	1.5	2.7
06-Transect_20250822095119.mat	25.2	67.679	246.333	0.32	0.375	3.4	3.7
Mean	25.2	67.866	246.59	0.277	0.365	2.7	5.1

Edges

File Name	Left Edge Type	Right Edge Type	Left Edge Distance (ft)	Right Edge Distance (ft)	Left Q (ft ³ /s)	Right Q (ft ³ /s)
03-Transect_20250822093452.mat	Triangular	Triangular	3	5	0.026	0.408
04-Transect_20250822094217.mat	Triangular	Triangular	3	5	-0.171	0.322
05-Transect_20250822094553.mat	Triangular	Triangular	3	5	-0.065	0.789
06-Transect_20250822095119.mat	Triangular	Triangular	3	5	-0.139	0.521
Mean	-	-	3	5	-0.088	0.51

Processing

Software:QRev 4.38
Navigation Reference:BT
Composite Tracks:Off
Magnetic Variation:13.35
Salinity:0.0
Depth Reference:BT
Extrapolation Method
(Top/Bottom Exponent):
Power / Power Exp: 0.1329

Instrument Details

Model:RS5
Frequency:Multi
Serial Number:RSS2441001
Firmware Version:1.51
Instrument Configuration:

Quality Assurance

Diagnostic Test Results:Pass
Compass Calibration Results:Yes
Moving Bed Test Type:Stationary
Moving Bed Condition:No

User Comments

[MovBedTst, 2025-08-25 10:58:12, devin.mortensen]:
[MovBedTst, 2025-08-25 10:58:55, devin.mortensen]:
[MovBedTst, 2025-08-25 10:59:05, devin.mortensen]:
[2025-08-25 11:01:18, devin.mortensen]: File Saved Q = 90.14 ft³/s (Uncertainty: 7.0%)
[MovBedTst, 2025-08-25 11:05:08, devin.mortensen]:
[MovBedTst, 2025-08-25 11:05:16, devin.mortensen]:
[2025-08-25 11:06:18, devin.mortensen]: File Saved Q = 90.06 ft³/s (Uncertainty: 5.9%)
[2025-08-25 11:13:12, devin.mortensen]: File Saved Q = 90.06 ft³/s (Uncertainty: 5.9%)

QRev Messages

Edges: User modified left number of ensembles.Moving-Bed Test: User modified valid test settings.Temperature: User modified independent temperature.
QRev Summary File: 20250825_110545_438_QRev_High_Low_Removed.mat_QRev

QRev Discharge Summary Note

Station Name: STCK02

Site ID: 1

Date: 08/27/2025

Total Q (ft³ / s): 146.742

Estimated Uncertainty (%): 7.0



Transect Discharge

File Name	Start Time	End Time	Start Edge	Top Q (ft ³ / s)	Middle Q (ft ³ / s)	Bottom Q (ft ³ / s)	Total Q (ft ³ / s)
04-Transect_20250827090204.mat	9:02:20	9:06:16	Right	18.73	105.053	19.391	143.766
05-Transect_20250827090619.mat	9:06:57	9:12:13	Left	17.895	101.028	18.841	138.396
06-Transect_20250827091216.mat	9:12:27	9:16:10	Right	18.525	105.096	19.248	142.929
07-Transect_20250827091612.mat	9:18:41	9:22:50	Left	20.382	116.963	20.93	158.428
09-Transect_20250827092547.mat	9:28:04	9:31:28	Left	20.388	111.574	20.644	153.193
10-Transect_20250827093131.mat	9:31:43	9:36:16	Right	18.539	104.575	19.937	143.741
Mean	-	-	-	19.076	107.382	19.832	146.742

Measurement Details

Mean Measurement Depth (ft): 3.606

Maximum Measurement Depth (ft): 5.023

Total Measurement Duration (s): 1501.00

File Name	Mean Temp (°C)	Width (ft)	Area (ft ²)	Mean Boat Speed (ft/s)	Mean V (ft/s)	Invalid Depth Cells (%)	Invalid Ens (%)
04-Transect_20250827090204.mat	24.8	69.452	259.213	0.312	0.554	0.6	1.7
05-Transect_20250827090619.mat	24.9	73.257	268.008	0.237	0.516	2.2	1.9
06-Transect_20250827091216.mat	25	73.598	267.485	0.331	0.534	0.7	7.6
07-Transect_20250827091612.mat	25	74.097	267.026	0.307	0.593	3	17.2
09-Transect_20250827092547.mat	25.2	73.72	267.408	0.337	0.573	1.8	2.4
10-Transect_20250827093131.mat	25.2	81.836	276.515	0.3	0.52	7.2	7.3
Mean	25	74.327	267.609	0.304	0.549	2.6	6.4

Edges

File Name	Left Edge Type	Right Edge Type	Left Edge Distance (ft)	Right Edge Distance (ft)	Left Q (ft ³ / s)	Right Q (ft ³ / s)
04-Transect_20250827090204.mat	Triangular	Triangular	3	8	-0.268	0.86
05-Transect_20250827090619.mat	Triangular	Triangular	3	8	-0.101	0.733
06-Transect_20250827091216.mat	Triangular	Triangular	3	8	-0.323	0.384
07-Transect_20250827091612.mat	Triangular	Triangular	3	8	-0.118	0.272
09-Transect_20250827092547.mat	Triangular	Triangular	3	8	-0.095	0.682
10-Transect_20250827093131.mat	Triangular	Triangular	3	8	-0.245	0.936
Mean	-	-	3	8	-0.192	0.644

Processing

Software:QRev 4.38
Navigation Reference:BT
Composite Tracks:Off
Magnetic Variation:13.51
Salinity:0.0
Depth Reference:BT
Extrapolation Method
(Top/Bottom Exponent):
Power / Power Exp: 0.0705

Instrument Details

Model:RS5
Frequency:Multi
Serial Number:RS52441001
Firmware Version:1.51
Instrument Configuration:

Quality Assurance

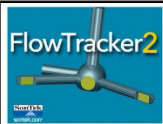
Diagnostic Test Results:Pass
Compass Calibration Results:Yes
Moving Bed Test Type:Stationary
Moving Bed Condition:No

User Comments

RS Comments: NA
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[MovBedTst, 2025-08-28 09:24:14, devin.mortensen]:
[MovBedTst, 2025-08-28 09:24:33, devin.mortensen]:
[MovBedTst, 2025-08-28 09:24:36, devin.mortensen]:
[2025-08-28 09:42:06, devin.mortensen]: File Saved Q = 146.74 ft³/s (Uncertainty: 7.0%)

QRev Messages

Moving-Bed Test: User modified valid test settings.Temperature: User modified independent temperature.
QRev Summary File: 20250828_094129_438_QRev_2_transects removed.mat_QRev



Discharge Measurement Summary

Site name STCK02
Site number 1
Operator(s)
File name STCK02_20250912-103023.ft
Comment

Start time	9/12/2025 9:03 AM	Sensor type	Top Setting
End time	9/12/2025 10:27 AM	Handheld serial number	FT2H2126012
Start location latitude	39.797	Probe serial number	FT2P2127007
Start location longitude	-122.262	Probe firmware	1.30
Calculations engine	FlowTracker2	Handheld software	2.0

# Stations	Avg interval (s)	Total discharge (ft³/s)
31	40	112.9785

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
77.400	214.5350	78.109

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
35	2.772	0.5266

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
74.134	4.000	0.7594

Discharge Uncertainty		
Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.1%	0.6%
Velocity	0.2%	2.1%
Width	0.1%	0.1%
Method	0.7%	
# Stations	1.7%	
Overall	2.1%	2.4%

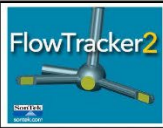
Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview

No changes were made to this file
 Quality control warnings

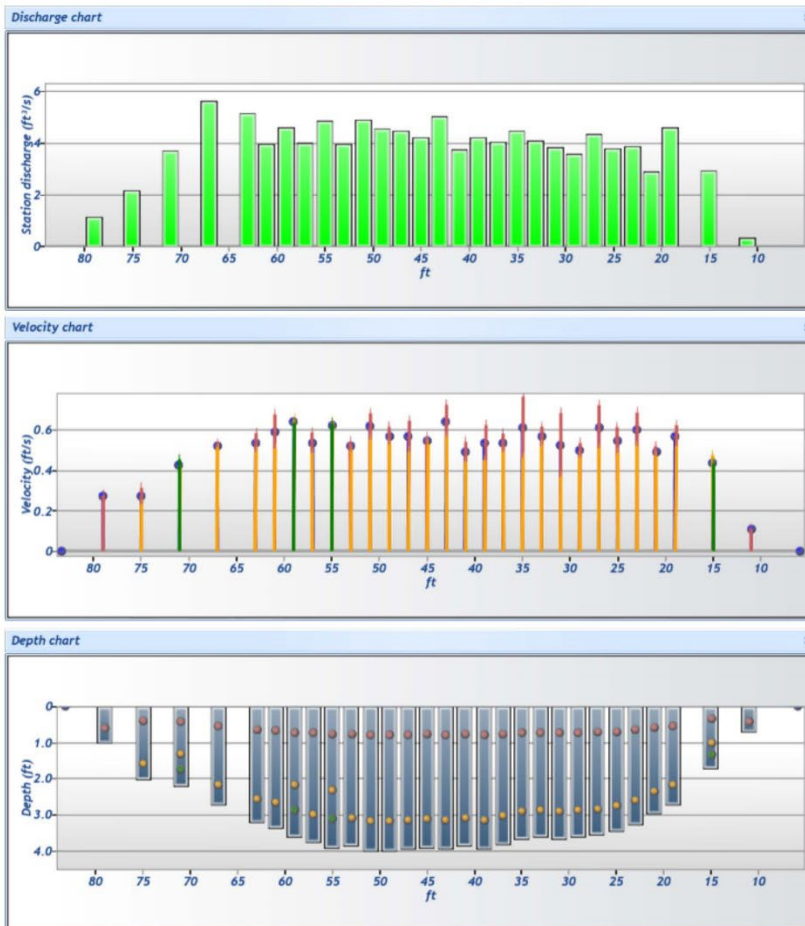
9/15/2025 8:42:00 AM



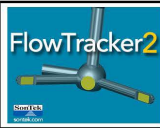
Discharge Measurement Summary

Site name STCK02
Site number 1
Operator(s)
File name STCK02_20250912-103023.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



9/15/2025 8:42:00 AM

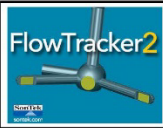


Discharge Measurement Summary

Site name STCK02
Site number 1
Operator(s)
File name STCK02_20250912-103023.ft
Comment

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q	
0	9:03 AM	5.900	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.1083	0.0000	0.0000	0.00	✓
1	9:04 AM	11.000	0.6	0.700	0.6000	0.420	80	0.1083	1.0000	0.1083	3.1850	0.3449	0.31	✓
2	9:06 AM	15.000	0.2/0.6/0.8	1.700	0.2000	0.340	80	0.3638	1.0000	0.4343	6.8000	2.9531	2.61	✓
2	9:06 AM	15.000	0.2/0.6/0.8	1.700	0.6000	1.020	80	0.4715	1.0000	0.4343	6.8000	2.9531	2.61	✓
2	9:06 AM	15.000	0.2/0.6/0.8	1.700	0.8000	1.360	80	0.4304	1.0000	0.4343	6.8000	2.9531	2.61	✓
3	9:10 AM	19.000	0.2/0.8	2.700	0.2000	0.540	80	0.6181	1.0000	0.5675	8.1000	4.5965	4.07	✓
3	9:10 AM	19.000	0.2/0.8	2.700	0.8000	2.160	80	0.5169	1.0000	0.5675	8.1000	4.5965	4.07	✓
4	10:21 AM	21.000	0.2/0.8	2.950	0.2000	0.590	80	0.5140	1.0000	0.4901	5.9000	2.8917	2.56	✓
4	10:21 AM	21.000	0.2/0.8	2.950	0.8000	2.360	80	0.4663	1.0000	0.4901	5.9000	2.8917	2.56	✓
5	9:13 AM	23.000	0.2/0.8	3.250	0.2000	0.650	80	0.6807	1.0000	0.5987	6.5000	3.8918	3.44	✓
5	9:13 AM	23.000	0.2/0.8	3.250	0.8000	2.600	80	0.5168	1.0000	0.5987	6.5000	3.8918	3.44	✓
6	10:18 AM	25.000	0.2/0.8	3.450	0.2000	0.690	80	0.6090	1.0000	0.5460	6.9000	3.7674	3.33	✓
6	10:18 AM	25.000	0.2/0.8	3.450	0.8000	2.760	80	0.4830	1.0000	0.5460	6.9000	3.7674	3.33	✓
7	9:17 AM	27.000	0.2/0.8	3.550	0.2000	0.710	80	0.7172	1.0000	0.6117	7.1000	4.3427	3.84	✓
7	9:17 AM	27.000	0.2/0.8	3.550	0.8000	2.840	80	0.5061	1.0000	0.6117	7.1000	4.3427	3.84	✓
8	10:15 AM	29.000	0.2/0.8	3.600	0.2000	0.720	80	0.5303	1.0000	0.4959	7.2000	3.5707	3.16	✓
8	10:15 AM	29.000	0.2/0.8	3.600	0.8000	2.880	80	0.4615	1.0000	0.4959	7.2000	3.5707	3.16	✓
9	9:19 AM	31.000	0.2/0.8	3.650	0.2000	0.730	80	0.6789	1.0000	0.5222	7.3000	3.8121	3.37	✓
9	9:19 AM	31.000	0.2/0.8	3.650	0.8000	2.920	80	0.3655	1.0000	0.5222	7.3000	3.8121	3.37	✓
10	10:24 AM	33.000	0.2/0.8	3.600	0.2000	0.720	80	0.6121	1.0000	0.5649	7.2000	4.0671	3.60	✓
10	10:24 AM	33.000	0.2/0.8	3.600	0.8000	2.880	80	0.5177	1.0000	0.5649	7.2000	4.0671	3.60	✓
11	9:22 AM	35.000	0.2/0.8	3.650	0.2000	0.730	80	0.7594	1.0000	0.6097	7.3000	4.4505	3.94	✓
11	9:22 AM	35.000	0.2/0.8	3.650	0.8000	2.920	80	0.4599	1.0000	0.6097	7.3000	4.4505	3.94	✓
12	10:12 AM	37.000	0.2/0.8	3.800	0.2000	0.760	80	0.5773	1.0000	0.5327	7.6000	4.0487	3.58	✓
12	10:12 AM	37.000	0.2/0.8	3.800	0.8000	3.040	80	0.4881	1.0000	0.5327	7.6000	4.0487	3.58	✓
13	9:24 AM	39.000	0.2/0.8	3.950	0.2000	0.790	80	0.6191	1.0000	0.5329	7.9000	4.2097	3.73	✓
13	9:24 AM	39.000	0.2/0.8	3.950	0.8000	3.160	80	0.4467	1.0000	0.5329	7.9000	4.2097	3.73	✓
14	10:10 AM	41.000	0.2/0.8	3.850	0.2000	0.770	80	0.5369	1.0000	0.4877	7.7000	3.7555	3.32	✓
14	10:10 AM	41.000	0.2/0.8	3.850	0.8000	3.080	80	0.4386	1.0000	0.4877	7.7000	3.7555	3.32	✓
15	9:27 AM	43.000	0.2/0.8	3.950	0.2000	0.790	80	0.7183	1.0000	0.6383	7.9000	5.0426	4.46	✓
15	9:27 AM	43.000	0.2/0.8	3.950	0.8000	3.160	80	0.5583	1.0000	0.6383	7.9000	5.0426	4.46	✓
16	10:06 AM	45.000	0.2/0.8	3.900	0.2000	0.780	80	0.5603	1.0000	0.5428	7.8000	4.2342	3.75	✓
16	10:06 AM	45.000	0.2/0.8	3.900	0.8000	3.120	80	0.5254	1.0000	0.5428	7.8000	4.2342	3.75	✓
17	9:30 AM	47.000	0.2/0.8	3.950	0.2000	0.790	80	0.6402	1.0000	0.5644	7.9000	4.4588	3.95	✓
17	9:30 AM	47.000	0.2/0.8	3.950	0.8000	3.160	80	0.4886	1.0000	0.5644	7.9000	4.4588	3.95	✓
18	10:04 AM	49.000	0.2/0.8	4.000	0.2000	0.800	80	0.6097	1.0000	0.5671	8.0000	4.5368	4.02	✓
18	10:04 AM	49.000	0.2/0.8	4.000	0.8000	3.200	80	0.5245	1.0000	0.5671	8.0000	4.5368	4.02	✓
19	9:32 AM	51.000	0.2/0.8	4.000	0.2000	0.800	80	0.6775	1.0000	0.6127	8.0000	4.9019	4.34	✓
19	9:32 AM	51.000	0.2/0.8	4.000	0.8000	3.200	80	0.5480	1.0000	0.6127	8.0000	4.9019	4.34	✓
20	10:01 AM	53.000	0.2/0.8	3.850	0.2000	0.770	80	0.5371	1.0000	0.5153	7.7000	3.9674	3.51	✓
20	10:01 AM	53.000	0.2/0.8	3.850	0.8000	3.080	80	0.4934	1.0000	0.5153	7.7000	3.9674	3.51	✓
21	9:35 AM	55.000	0.2/0.6/0.8	3.900	0.2000	0.780	80	0.5880	1.0000	0.6200	7.8000	4.8358	4.28	✓
21	9:35 AM	55.000	0.2/0.6/0.8	3.900	0.6000	2.340	80	0.6325	1.0000	0.6200	7.8000	4.8358	4.28	✓
21	9:35 AM	55.000	0.2/0.6/0.8	3.900	0.8000	3.120	80	0.6269	1.0000	0.6200	7.8000	4.8358	4.28	✓
22	9:59 AM	57.000	0.2/0.8	3.750	0.2000	0.750	80	0.5837	1.0000	0.5335	7.5000	4.0010	3.54	✓
22	9:59 AM	57.000	0.2/0.8	3.750	0.8000	3.000	80	0.4832	1.0000	0.5335	7.5000	4.0010	3.54	✓
23	9:38 AM	59.000	0.2/0.6/0.8	3.600	0.2000	0.720	80	0.6231	1.0000	0.6381	7.2000	4.5945	4.07	✓
23	9:38 AM	59.000	0.2/0.6/0.8	3.600	0.6000	2.160	80	0.6498	1.0000	0.6381	7.2000	4.5945	4.07	✓
23	9:38 AM	59.000	0.2/0.6/0.8	3.600	0.8000	2.880	80	0.6299	1.0000	0.6381	7.2000	4.5945	4.07	✓
24	10:27 AM	61.000	0.2/0.8	3.350	0.2000	0.670	80	0.6721	1.0000	0.5878	6.7000	3.9386	3.49	✓
24	10:27 AM	61.000	0.2/0.8	3.350	0.8000	2.680	80	0.5036	1.0000	0.5878	6.7000	3.9386	3.49	✓
25	9:42 AM	63.000	0.2/0.8	3.200	0.2000	0.640	80	0.5802	1.0000	0.5354	6.6000	3.1402	4.55	✓
25	9:42 AM	63.000	0.2/0.8	3.200	0.8000	2.560	80	0.4907	1.0000	0.5354	6.6000	3.1402	4.55	✓
26	9:45 AM	67.000	0.2/0.8	2.700	0.2000	0.540	80	0.5275	1.0000	0.5187	10.8000	5.6017	4.96	✓
26	9:45 AM	67.000	0.2/0.8	2.700	0.8000	2.160	80	0.5098	1.0000	0.5187	10.8000	5.6017	4.96	✓
27	9:48 AM	71.000	0.2/0.6/0.8	2.200	0.2000	0.440	80	0.4250	1.0000	0.4220	8.8000	3.7132	3.29	✓
27	9:48 AM	71.000	0.2/0.6/0.8	2.200	0.6000	1.320	80	0.4059	1.0000	0.4220	8.8000	3.7132	3.29	✓
27	9:48 AM	71.000	0.2/0.6/0.8	2.200	0.8000	1.760	80	0.4510	1.0000	0.4220	8.8000	3.7132	3.29	✓
28	9:51 AM	75.000	0.2/0.8	2.000	0.2000	0.400	80	0.3108	1.0000	0.2712	8.0000	2.1692	1.92	✓
28	9:51 AM	75.000	0.2/0.8	2.000	0.8000	1.600	80	0.2315	1.0000	0.2712	8.0000	2.1692	1.92	✓
29	9:54 AM	79.000	0.6	1.000	0.6000	0.600	80	0.2747	1.0000	0.2747	4.1500	1.1402	1.01	✓
30	9:55 AM	83.300	None	0.000	0.0000	0.000	0	0.0000		0.2747	0.0000	0.0000	0.00	✓

9/15/2025 8:42:00 AM



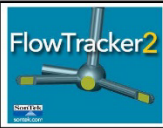
Discharge Measurement Summary

Site name STCK02
Site number 1
Operator(s)
File name STCK02_20250912-103023.ft
Comment

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	15.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings							
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	9:04 AM	11.000	0.6	0.700	0.6000	0.420	Velocity Angle > QC
30	9:55 AM	83.300	None	0.000	0.0000	0.000	Water Depth > QC

9/15/2025 8:42:00 AM

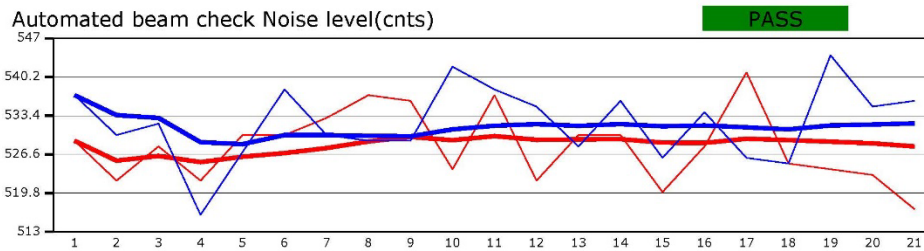
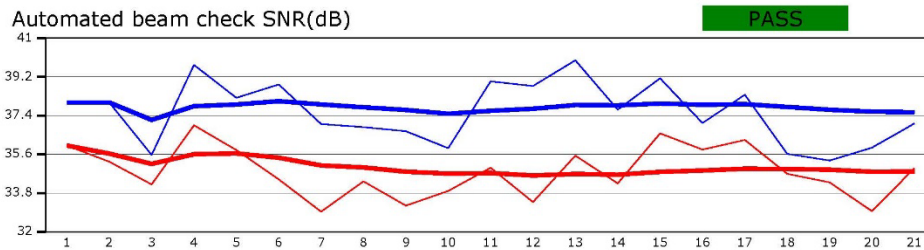


Discharge Measurement Summary

Site name STCK02
Site number 1
Operator(s)
File name STCK02_20250912-103023.ft
Comment

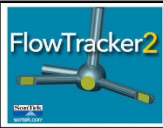
Beam 1	
Beam 2	

Automated beam check Start time 9/12/2025 9:02:37 AM



Automated beam check Quality control warnings
 No quality control warnings

9/15/2025 8:42:00 AM

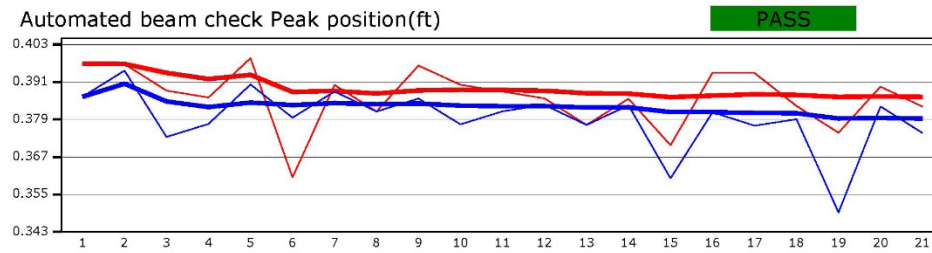
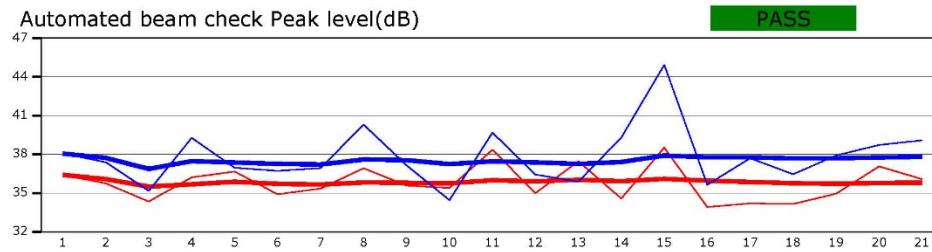


Discharge Measurement Summary

Site name STCK02
Site number 1
Operator(s)
File name STCK02_20250912-103023.ft
Comment

Beam 1	
Beam 2	

Automated beam check Start time 9/12/2025 9:02:37 AM



Automated beam check Quality control warnings
 No quality control warnings

9/15/2025 8:42:00 AM

6.1.1.2 STCK03

Discharge Measurement Summary

Site name	STCK03
Site number	1
Operator(s)	DM
File name	STCK03_20250822-162529.ft
Comment	

Start time	8/22/2025 11:46 AM	Sensor type	Top Setting
End time	8/22/2025 12:49 PM	Handheld serial number	FT2H2126012
Start location latitude	39.775	Probe serial number	FT2P2127007
Start location longitude	-122.209	Probe firmware	1.30
Calculations engine	FlowTracker2	Handheld software	2.0

# Stations	Avg interval (s)	Total discharge (ft³/s)
40	40	76.9793

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
74.200	55.8550	74.294

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
26	0.753	1.3782

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
82.143	1.450	1.8812

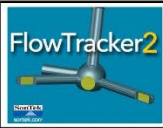
Discharge Uncertainty		
Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.2%	1.8%
Velocity	0.5%	1.9%
Width	0.1%	0.1%
Method	1.4%	
# Stations	1.3%	
Overall	2.2%	2.8%

Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview
No changes were made to this file
Quality control warnings

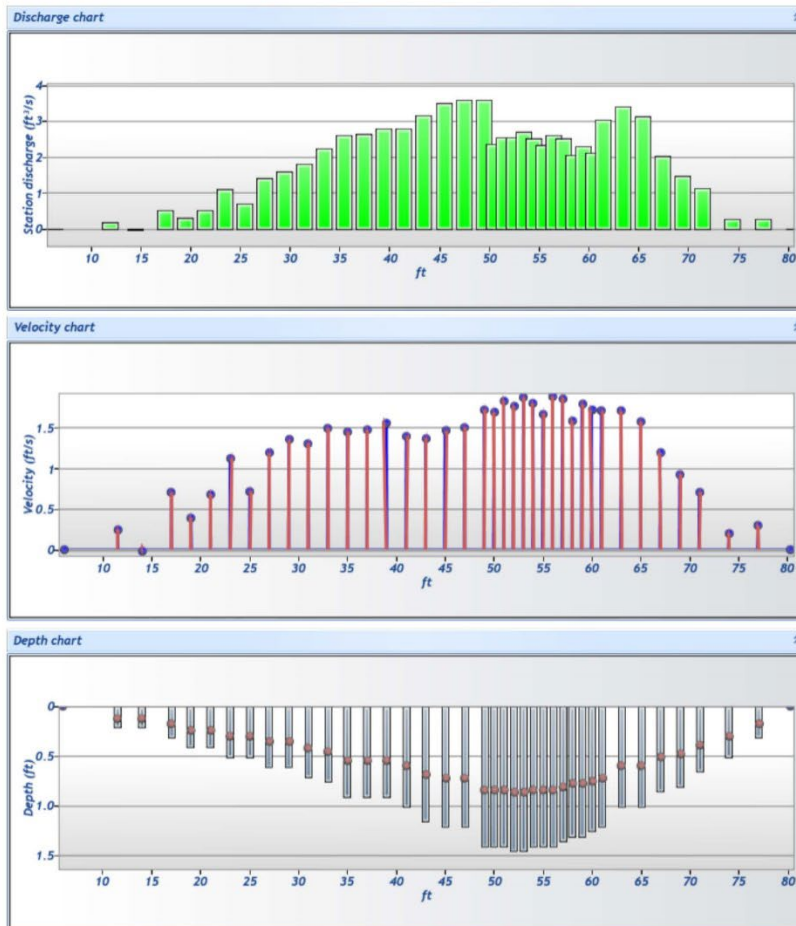
8/25/2025 9:42:26 AM



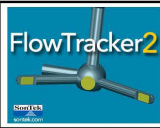
Discharge Measurement Summary

Site name STCK03
Site number 1
Operator(s) DM
File name STCK03_20250822-162529.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



8/25/2025 9:42:26 AM



Discharge Measurement Summary

Site name STCK03
Site number 1
Operator(s) DM
File name STCK03_20250822-162529.ft
Comment

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft ²)	Flow (ft ³ /s)	%Q
0	11:46 AM	6.000	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.2516	0.0000	0.0000	0.00
1	11:46 AM	11.500	0.6	0.200	0.6000	0.120	80	0.2516	1.0000	0.2516	0.8000	0.2013	0.26
2	11:49 AM	14.000	0.6	0.200	0.6000	0.120	80	-0.0138	1.0000	-0.0138	0.5500	-0.0076	-0.01
3	11:50 AM	17.000	0.6	0.300	0.6000	0.180	80	0.7026	1.0000	0.7026	0.7500	0.5270	0.68
4	11:52 AM	19.000	0.6	0.400	0.6000	0.240	80	0.3918	1.0000	0.3918	0.8000	0.3134	0.41
5	11:53 AM	21.000	0.6	0.400	0.6000	0.240	80	0.6846	1.0000	0.6846	0.8000	0.5477	0.71
6	11:55 AM	23.000	0.6	0.500	0.6000	0.300	80	1.1309	1.0000	1.1309	1.0000	1.1309	1.47
7	11:56 AM	25.000	0.6	0.500	0.6000	0.300	80	0.7186	1.0000	0.7186	1.0000	0.7186	0.93
8	11:57 AM	27.000	0.6	0.600	0.6000	0.360	80	1.1880	1.0000	1.1880	1.2000	1.4256	1.85
9	11:58 AM	29.000	0.6	0.600	0.6000	0.360	80	1.3504	1.0000	1.3504	1.2000	1.6205	2.11
10	12:00 PM	31.000	0.6	0.700	0.6000	0.420	80	1.3093	1.0000	1.3093	1.4000	1.8330	2.38
11	12:02 PM	33.000	0.6	0.750	0.6000	0.450	80	1.4959	1.0000	1.4959	1.5000	2.2438	2.91
12	12:03 PM	35.000	0.6	0.900	0.6000	0.540	80	1.4533	1.0000	1.4533	1.8000	2.6159	3.40
13	12:05 PM	37.000	0.6	0.900	0.6000	0.540	80	1.4724	1.0000	1.4724	1.8000	2.6503	3.44
14	12:06 PM	39.000	0.6	0.900	0.6000	0.540	80	1.5618	1.0000	1.5618	1.8000	2.8113	3.65
15	12:08 PM	41.000	0.6	1.000	0.6000	0.600	80	1.4014	1.0000	1.4014	2.0000	2.8028	3.64
16	12:10 PM	43.000	0.6	1.150	0.6000	0.690	80	1.3741	1.0000	1.3741	2.3000	3.1604	4.11
17	12:11 PM	45.000	0.6	1.200	0.6000	0.720	80	1.4649	1.0000	1.4649	2.4000	3.5158	4.57
18	12:13 PM	47.000	0.6	1.200	0.6000	0.720	80	1.5048	1.0000	1.5048	2.4000	3.6116	4.69
19	12:14 PM	49.000	0.6	1.400	0.6000	0.840	80	1.7206	1.0000	1.7206	2.1000	3.6133	4.69
20	12:40 PM	50.000	0.6	1.400	0.6000	0.840	80	1.6928	1.0000	1.6928	1.4000	2.3699	3.08
21	12:16 PM	51.000	0.6	1.400	0.6000	0.840	80	1.8354	1.0000	1.8354	1.4000	2.5696	3.34
22	12:42 PM	52.000	0.6	1.450	0.6000	0.870	80	1.7691	1.0000	1.7691	1.4500	2.5652	3.33
23	12:17 PM	53.000	0.6	1.450	0.6000	0.870	80	1.8718	1.0000	1.8718	1.4500	2.7142	3.53
24	12:44 PM	54.000	0.6	1.400	0.6000	0.840	80	1.7982	1.0000	1.7982	1.4000	2.5174	3.27
25	12:20 PM	55.000	0.6	1.400	0.6000	0.840	80	1.6728	1.0000	1.6728	1.4000	2.3419	3.04
26	12:45 PM	56.000	0.6	1.400	0.6000	0.840	80	1.8812	1.0000	1.8812	1.4000	2.6337	3.42
27	12:21 PM	57.000	0.6	1.350	0.6000	0.810	80	1.8640	1.0000	1.8640	1.3500	2.5164	3.27
28	12:47 PM	58.000	0.6	1.300	0.6000	0.780	80	1.5862	1.0000	1.5862	1.3000	2.0621	2.68
29	12:22 PM	59.000	0.6	1.300	0.6000	0.780	80	1.7890	1.0000	1.7890	1.3000	2.3258	3.02
30	12:49 PM	60.000	0.6	1.250	0.6000	0.750	80	1.7179	1.0000	1.7179	1.2500	2.1473	2.79
31	12:25 PM	61.000	0.6	1.200	0.6000	0.720	80	1.7027	1.0000	1.7027	1.8000	3.0648	3.98
32	12:26 PM	63.000	0.6	1.000	0.6000	0.600	80	1.7036	1.0000	1.7036	2.0000	3.4072	4.43
33	12:28 PM	65.000	0.6	1.000	0.6000	0.600	80	1.5775	1.0000	1.5775	2.0000	3.1550	4.10
34	12:29 PM	67.000	0.6	0.850	0.6000	0.510	80	1.1948	1.0000	1.1948	1.7000	2.0312	2.64
35	12:31 PM	69.000	0.6	0.800	0.6000	0.480	80	0.9302	1.0000	0.9302	1.6000	1.4883	1.93
36	12:33 PM	71.000	0.6	0.650	0.6000	0.390	80	0.7086	1.0000	0.7086	1.6250	1.1515	1.50
37	12:34 PM	74.000	0.6	0.500	0.6000	0.300	80	0.2021	1.0000	0.2021	1.5000	0.3032	0.39
38	12:37 PM	77.000	0.6	0.300	0.6000	0.180	80	0.3002	1.0000	0.3002	0.9300	0.2792	0.36
39	12:39 PM	80.200	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.3002	0.0000	0.0000	0.00

8/25/2025 9:42:26 AM



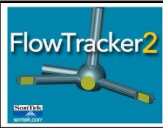
Discharge Measurement Summary

Site name STCK03
Site number 1
Operator(s) DM
File name STCK03_20250822-162529.ft
Comment

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	15.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings							
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	11:46 AM	11.500	0.6	0.200	0.6000	0.120	Boundary Interference
11	12:02 PM	33.000	0.6	0.750	0.6000	0.450	Standard Error > QC
12	12:03 PM	35.000	0.6	0.900	0.6000	0.540	Standard Error > QC
13	12:05 PM	37.000	0.6	0.900	0.6000	0.540	Standard Error > QC
14	12:06 PM	39.000	0.6	0.900	0.6000	0.540	Standard Error > QC
15	12:08 PM	41.000	0.6	1.000	0.6000	0.600	Standard Error > QC
16	12:10 PM	43.000	0.6	1.150	0.6000	0.690	Standard Error > QC
17	12:11 PM	45.000	0.6	1.200	0.6000	0.720	Standard Error > QC
18	12:13 PM	47.000	0.6	1.200	0.6000	0.720	Standard Error > QC
19	12:14 PM	49.000	0.6	1.400	0.6000	0.840	Standard Error > QC
20	12:40 PM	50.000	0.6	1.400	0.6000	0.840	Standard Error > QC
21	12:16 PM	51.000	0.6	1.400	0.6000	0.840	Standard Error > QC
22	12:42 PM	52.000	0.6	1.450	0.6000	0.870	Standard Error > QC
23	12:17 PM	53.000	0.6	1.450	0.6000	0.870	Standard Error > QC
24	12:44 PM	54.000	0.6	1.400	0.6000	0.840	Standard Error > QC
25	12:20 PM	55.000	0.6	1.400	0.6000	0.840	Standard Error > QC
26	12:45 PM	56.000	0.6	1.400	0.6000	0.840	Standard Error > QC
27	12:21 PM	57.000	0.6	1.350	0.6000	0.810	Standard Error > QC
28	12:47 PM	58.000	0.6	1.300	0.6000	0.780	Standard Error > QC
29	12:22 PM	59.000	0.6	1.300	0.6000	0.780	Standard Error > QC
30	12:49 PM	60.000	0.6	1.250	0.6000	0.750	Standard Error > QC
31	12:25 PM	61.000	0.6	1.200	0.6000	0.720	Standard Error > QC
32	12:26 PM	63.000	0.6	1.000	0.6000	0.600	Standard Error > QC
33	12:28 PM	65.000	0.6	1.000	0.6000	0.600	Standard Error > QC
34	12:29 PM	67.000	0.6	0.850	0.6000	0.510	Standard Error > QC
37	12:34 PM	74.000	0.6	0.500	0.6000	0.300	Large SNR Variation
38	12:37 PM	77.000	0.6	0.300	0.6000	0.180	Boundary Interference, Large SNR Variation

8/25/2025 9:42:26 AM

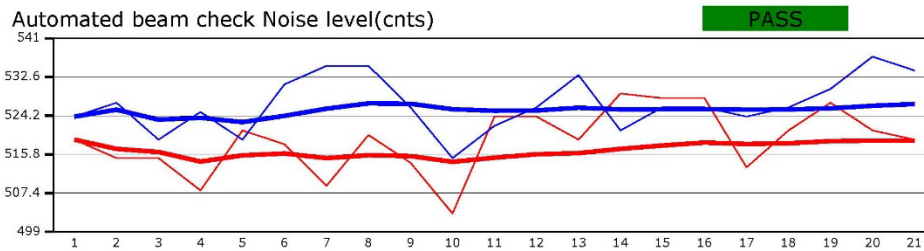
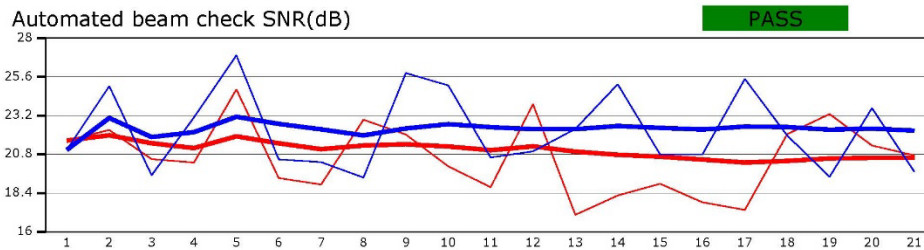


Discharge Measurement Summary

Site name STCK03
Site number 1
Operator(s) DM
File name STCK03_20250822-162529.ft
Comment

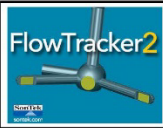
Beam 1	
Beam 2	

Automated beam check Start time 8/22/2025 11:46:04 AM



Automated beam check Quality control warnings
 No quality control warnings

8/25/2025 9:42:26 AM

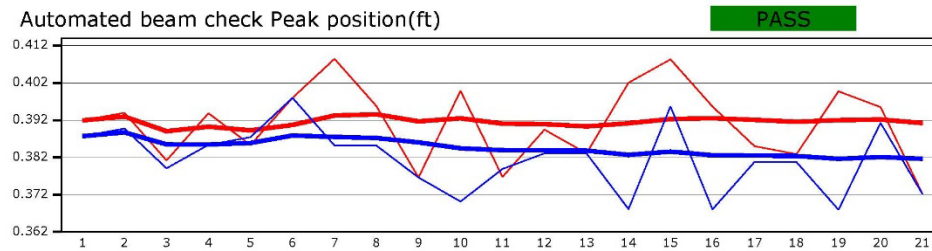
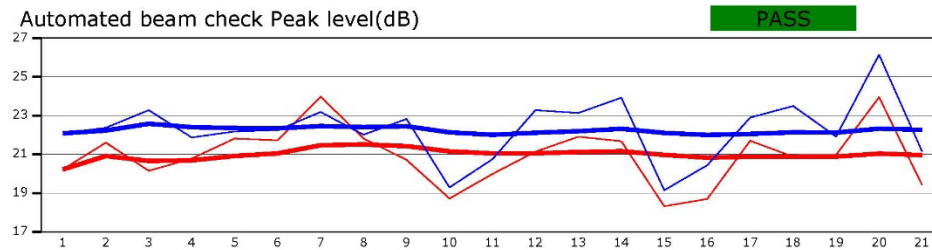


Discharge Measurement Summary

Site name STCK03
Site number 1
Operator(s) DM
File name STCK03_20250822-162529.ft
Comment

Beam 1	
Beam 2	

Automated beam check Start time 8/22/2025 11:46:04 AM



Automated beam check Quality control warnings
 No quality control warnings

8/25/2025 9:42:26 AM



Discharge Measurement Summary

Site name STCK03
Site number 1
Operator(s) DM
File name STCK03_20250827-120812.ft
Comment

Start time 8/27/2025 10:48 AM	Sensor type Top Setting
End time 8/27/2025 11:53 AM	Handheld serial number FT2H2126012
Start location latitude 39.775	Probe serial number FT2P2127007
Start location longitude -122.209	Probe firmware 1.30
Calculations engine FlowTracker2	Handheld software 2.0

# Stations	Avg interval (s)	Total discharge (ft³/s)
33	40	131.7578

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
79.600	70.6750	79.736

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
32	0.888	1.8643

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
78.918	1.650	2.8788

Discharge Uncertainty		
Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.2%	1.7%
Velocity	0.3%	1.2%
Width	0.1%	0.1%
Method	1.2%	
# Stations	1.6%	
Overall	2.2%	2.3%

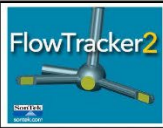
Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview

No changes were made to this file
 Quality control warnings

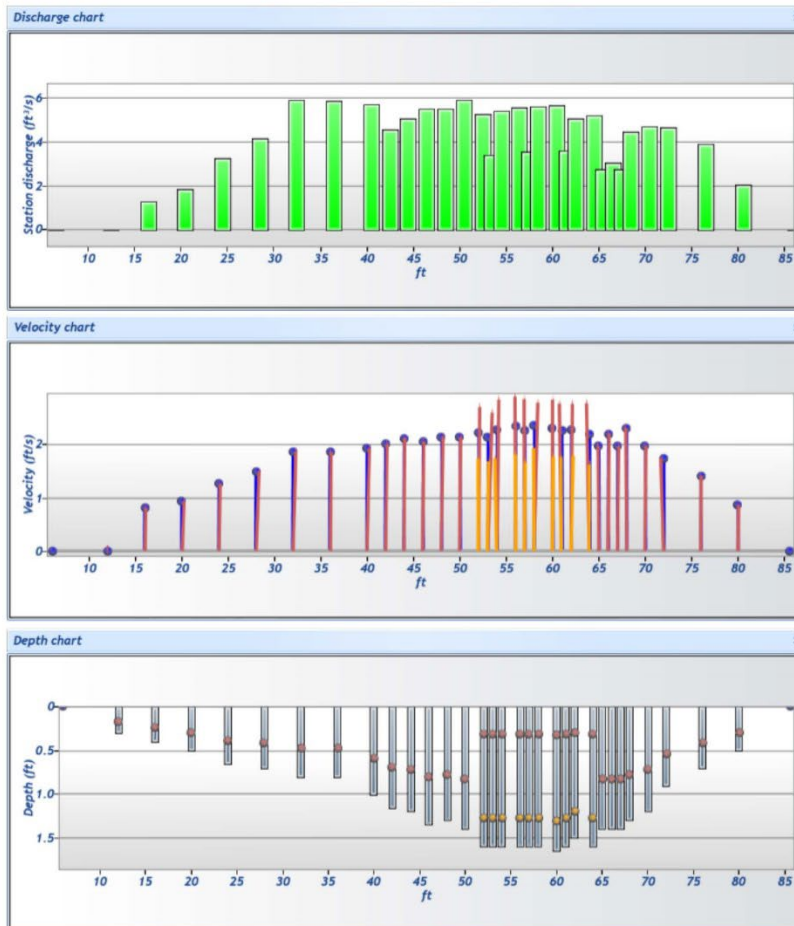
8/28/2025 9:03:49 AM



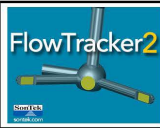
Discharge Measurement Summary

Site name STCK03
Site number 1
Operator(s) DM
File name STCK03_20250827-120812.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



8/28/2025 9:03:49 AM

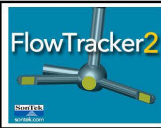


Discharge Measurement Summary

Site name STCK03
Site number 1
Operator(s) DM
File name STCK03_20250827-120812.ft
Comment

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft ²)	Flow (ft ³ /s)	%Q
0	10:48 AM	6.000	None	0.000	0.000	0.000	0	0.0000	1.0000	0.0024	0.0000	0.0000	0.00
1	10:48 AM	12.000	0.6	0.300	0.6000	0.180	80	-0.0024	1.0000	-0.0024	1.5000	-0.0037	0.00
2	10:49 AM	16.000	0.6	0.400	0.6000	0.240	80	0.8098	1.0000	0.8098	1.6000	1.2956	0.98
3	10:52 AM	20.000	0.6	0.500	0.6000	0.300	80	0.9348	1.0000	0.9348	2.0000	1.8695	1.42
4	10:54 AM	24.000	0.6	0.650	0.6000	0.390	80	1.2518	1.0000	1.2518	2.6000	3.2547	2.47
5	10:55 AM	28.000	0.6	0.700	0.6000	0.420	80	1.4825	1.0000	1.4825	2.8000	4.1511	3.15
6	10:57 AM	32.000	0.6	0.800	0.6000	0.480	80	1.8604	1.0000	1.8604	3.2000	5.9532	4.52
7	10:59 AM	36.000	0.6	0.800	0.6000	0.480	80	1.8474	1.0000	1.8474	3.2000	5.9118	4.49
8	11:00 AM	40.000	0.6	1.000	0.6000	0.600	80	1.9158	1.0000	1.9158	3.0000	5.7474	4.36
9	11:39 AM	42.000	0.6	1.150	0.6000	0.690	80	1.9953	1.0000	1.9953	2.3000	4.5892	3.48
10	11:02 AM	44.000	0.6	1.200	0.6000	0.720	80	2.1094	1.0000	2.1094	2.4000	5.0626	3.84
11	11:37 AM	46.000	0.6	1.350	0.6000	0.810	80	2.0427	1.0000	2.0427	2.7000	5.5154	4.19
12	11:03 AM	48.000	0.6	1.300	0.6000	0.780	80	2.1332	1.0000	2.1332	2.6000	5.5464	4.21
13	11:35 AM	50.000	0.6	1.400	0.6000	0.840	80	2.1250	1.0000	2.1250	2.8000	5.9501	4.52
14	11:05 AM	52.000	0.2/0.8	1.600	0.2000	0.320	80	2.6819	1.0000	2.1993	2.4000	5.2784	4.01
14	11:05 AM	52.000	0.2/0.8	1.600	0.8000	1.280	80	1.7168	1.0000	2.1993	2.4000	5.2784	4.01
15	11:41 AM	53.000	0.2/0.8	1.600	0.2000	0.320	80	2.5788	1.0000	2.1260	1.6000	3.4016	2.58
15	11:41 AM	53.000	0.2/0.8	1.600	0.8000	1.280	80	1.6731	1.0000	2.1260	1.6000	3.4016	2.58
16	11:31 AM	54.000	0.2/0.8	1.600	0.2000	0.320	80	2.8210	1.0000	2.2748	2.4000	5.4596	4.14
16	11:31 AM	54.000	0.2/0.8	1.600	0.8000	1.280	80	1.7286	1.0000	2.2748	2.4000	5.4596	4.14
17	11:07 AM	56.000	0.2/0.8	1.600	0.2000	0.320	80	2.8788	1.0000	2.3359	2.4000	5.6061	4.25
17	11:07 AM	56.000	0.2/0.8	1.600	0.8000	1.280	80	1.7929	1.0000	2.3359	2.4000	5.6061	4.25
18	11:44 AM	57.000	0.2/0.8	1.600	0.2000	0.320	80	2.8298	1.0000	2.2374	1.6000	3.5798	2.72
18	11:44 AM	57.000	0.2/0.8	1.600	0.8000	1.280	80	1.6450	1.0000	2.2374	1.6000	3.5798	2.72
19	11:29 AM	58.000	0.2/0.8	1.600	0.2000	0.320	80	2.7639	1.0000	2.3412	2.4000	5.6188	4.26
19	11:29 AM	58.000	0.2/0.8	1.600	0.8000	1.280	80	1.9185	1.0000	2.3412	2.4000	5.6188	4.26
20	11:10 AM	60.000	0.2/0.8	1.650	0.2000	0.330	80	2.8220	1.0000	2.2894	2.4750	5.6661	4.30
20	11:10 AM	60.000	0.2/0.8	1.650	0.8000	1.320	80	1.7567	1.0000	2.2894	2.4750	5.6661	4.30
21	11:47 AM	61.000	0.2/0.8	1.600	0.2000	0.320	80	2.7503	1.0000	2.2516	1.6000	3.6026	2.73
21	11:47 AM	61.000	0.2/0.8	1.600	0.8000	1.280	80	1.7530	1.0000	2.2516	1.6000	3.6026	2.73
22	11:24 AM	62.000	0.2/0.8	1.500	0.2000	0.300	80	2.7437	1.0000	2.2591	2.2500	5.0830	3.86
22	11:24 AM	62.000	0.2/0.8	1.500	0.8000	1.200	80	1.7745	1.0000	2.2591	2.2500	5.0830	3.86
23	11:13 AM	64.000	0.2/0.8	1.600	0.2000	0.320	80	2.7540	1.0000	2.1798	2.4000	5.2316	3.97
23	11:13 AM	64.000	0.2/0.8	1.600	0.8000	1.280	80	1.6057	1.0000	2.1798	2.4000	5.2316	3.97
24	11:50 AM	65.000	0.6	1.400	0.6000	0.840	80	1.9604	1.0000	1.9604	1.4000	2.7445	2.08
25	11:23 AM	66.000	0.6	1.400	0.6000	0.840	80	2.1921	1.0000	2.1921	1.4000	3.0689	2.33
26	11:52 AM	67.000	0.6	1.400	0.6000	0.840	80	1.9541	1.0000	1.9541	1.4000	2.7357	2.08
27	11:15 AM	68.000	0.6	1.300	0.6000	0.780	80	2.2953	1.0000	2.2953	1.9500	4.4758	3.40
28	11:53 AM	70.000	0.6	1.200	0.6000	0.720	80	1.9639	1.0000	1.9639	2.4000	4.7133	3.58
29	11:17 AM	72.000	0.6	0.900	0.6000	0.540	80	1.7246	1.0000	1.7246	2.7000	4.6565	3.53
30	11:19 AM	76.000	0.6	0.700	0.6000	0.420	80	1.4055	1.0000	1.4055	2.8000	3.9353	2.99
31	11:20 AM	80.000	0.6	0.500	0.6000	0.300	80	0.8571	1.0000	0.8571	2.4000	2.0569	1.56
32	11:22 AM	85.600	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.8571	0.0000	0.0000	0.00

8/28/2025 9:03:49 AM



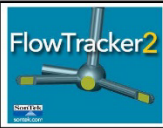
Discharge Measurement Summary

Site name STCK03
Site number 1
Operator(s) DM
File name STCK03_20250827-120812.ft
Comment

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	15.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings							
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
7	10:59 AM	36.000	0.6	0.800	0.6000	0.480	Standard Error > QC
8	11:00 AM	40.000	0.6	1.000	0.6000	0.600	Standard Error > QC
9	11:39 AM	42.000	0.6	1.150	0.6000	0.690	Standard Error > QC
10	11:02 AM	44.000	0.6	1.200	0.6000	0.720	Standard Error > QC
11	11:37 AM	46.000	0.6	1.350	0.6000	0.810	Standard Error > QC
12	11:03 AM	48.000	0.6	1.300	0.6000	0.780	Standard Error > QC
13	11:35 AM	50.000	0.6	1.400	0.6000	0.840	Standard Error > QC
14	11:05 AM	52.000	0.2/0.8	1.600	0.2000	0.320	Standard Error > QC
14	11:05 AM	52.000	0.2/0.8	1.600	0.8000	1.280	Standard Error > QC
15	11:41 AM	53.000	0.2/0.8	1.600	0.2000	0.320	Standard Error > QC
15	11:41 AM	53.000	0.2/0.8	1.600	0.8000	1.280	Standard Error > QC
16	11:31 AM	54.000	0.2/0.8	1.600	0.2000	0.320	Standard Error > QC
16	11:31 AM	54.000	0.2/0.8	1.600	0.8000	1.280	Standard Error > QC
17	11:07 AM	56.000	0.2/0.8	1.600	0.2000	0.320	Standard Error > QC
17	11:07 AM	56.000	0.2/0.8	1.600	0.8000	1.280	Standard Error > QC
18	11:44 AM	57.000	0.2/0.8	1.600	0.2000	0.320	Standard Error > QC
18	11:44 AM	57.000	0.2/0.8	1.600	0.8000	1.280	Standard Error > QC
19	11:29 AM	58.000	0.2/0.8	1.600	0.2000	0.320	Standard Error > QC
19	11:29 AM	58.000	0.2/0.8	1.600	0.8000	1.280	Standard Error > QC
20	11:10 AM	60.000	0.2/0.8	1.650	0.2000	0.330	Standard Error > QC
20	11:10 AM	60.000	0.2/0.8	1.650	0.8000	1.320	Standard Error > QC
21	11:47 AM	61.000	0.2/0.8	1.600	0.2000	0.320	Standard Error > QC
21	11:47 AM	61.000	0.2/0.8	1.600	0.8000	1.280	Standard Error > QC
22	11:24 AM	62.000	0.2/0.8	1.500	0.2000	0.300	Standard Error > QC
22	11:24 AM	62.000	0.2/0.8	1.500	0.8000	1.200	Standard Error > QC
23	11:13 AM	64.000	0.2/0.8	1.600	0.2000	0.320	Standard Error > QC
23	11:13 AM	64.000	0.2/0.8	1.600	0.8000	1.280	Standard Error > QC
24	11:50 AM	65.000	0.6	1.400	0.6000	0.840	Standard Error > QC
25	11:23 AM	66.000	0.6	1.400	0.6000	0.840	Standard Error > QC
26	11:52 AM	67.000	0.6	1.400	0.6000	0.840	Standard Error > QC
27	11:15 AM	68.000	0.6	1.300	0.6000	0.780	Standard Error > QC
28	11:53 AM	70.000	0.6	1.200	0.6000	0.720	Standard Error > QC
30	11:19 AM	76.000	0.6	0.700	0.6000	0.420	Standard Error > QC
31	11:20 AM	80.000	0.6	0.500	0.6000	0.300	Standard Error > QC

8/28/2025 9:03:49 AM

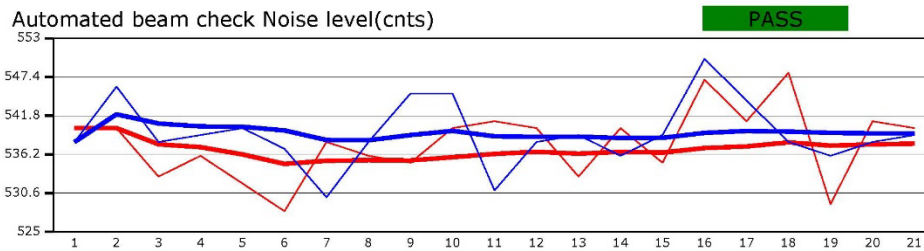
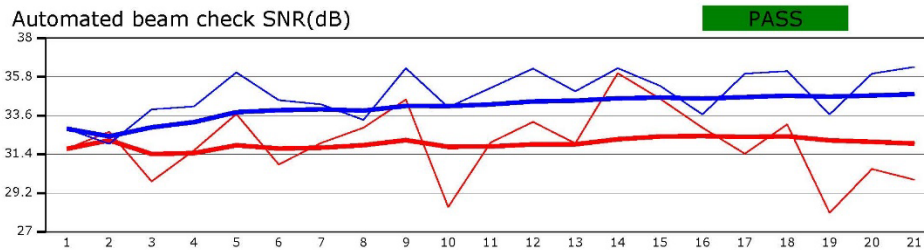


Discharge Measurement Summary

Site name STCK03
Site number 1
Operator(s) DM
File name STCK03_20250827-120812.ft
Comment

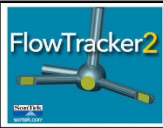
Beam 1	
Beam 2	

Automated beam check Start time 8/27/2025 10:46:56 AM



Automated beam check Quality control warnings
 No quality control warnings

8/28/2025 9:03:49 AM

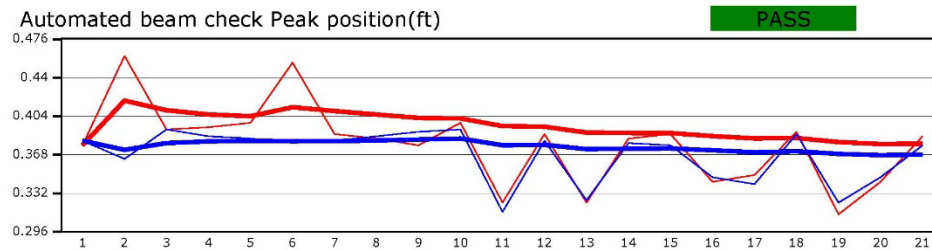
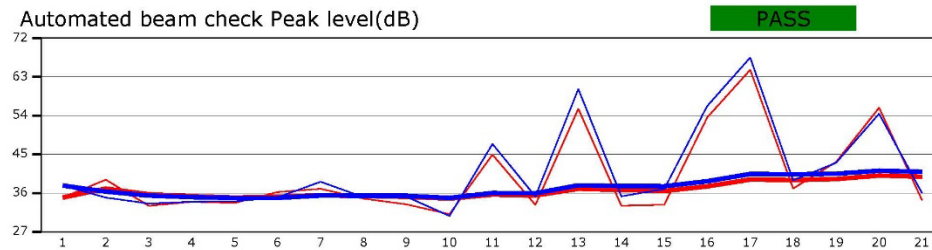


Discharge Measurement Summary

Site name STCK03
Site number 1
Operator(s) DM
File name STCK03_20250827-120812.ft
Comment

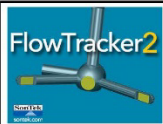
Beam 1	
Beam 2	

Automated beam check Start time 8/27/2025 10:46:56 AM



Automated beam check Quality control warnings
 No quality control warnings

8/28/2025 9:03:49 AM



Discharge Measurement Summary

Site name STCK03
Site number 1
Operator(s) DM
File name STCK03_20250912-123824.ft
Comment

Start time	9/12/2025 11:44 AM	Sensor type	Top Setting
End time	9/12/2025 12:36 PM	Handheld serial number	FT2H2126012
Start location latitude	39.775	Probe serial number	FT2P2127007
Start location longitude	-122.208	Probe firmware	1.30
Calculations engine	FlowTracker2	Handheld software	2.0

# Stations	Avg interval (s)	Total discharge (ft³/s)
28	40	111.7155

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
76.300	59.2050	76.406

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
31	0.776	1.8869

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
77.036	1.600	2.9137

Discharge Uncertainty		
Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.2%	2.1%
Velocity	0.4%	2.0%
Width	0.1%	0.1%
Method	1.4%	
# Stations	1.8%	
Overall	2.5%	3.0%

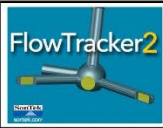
Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview

No changes were made to this file
 Quality control warnings

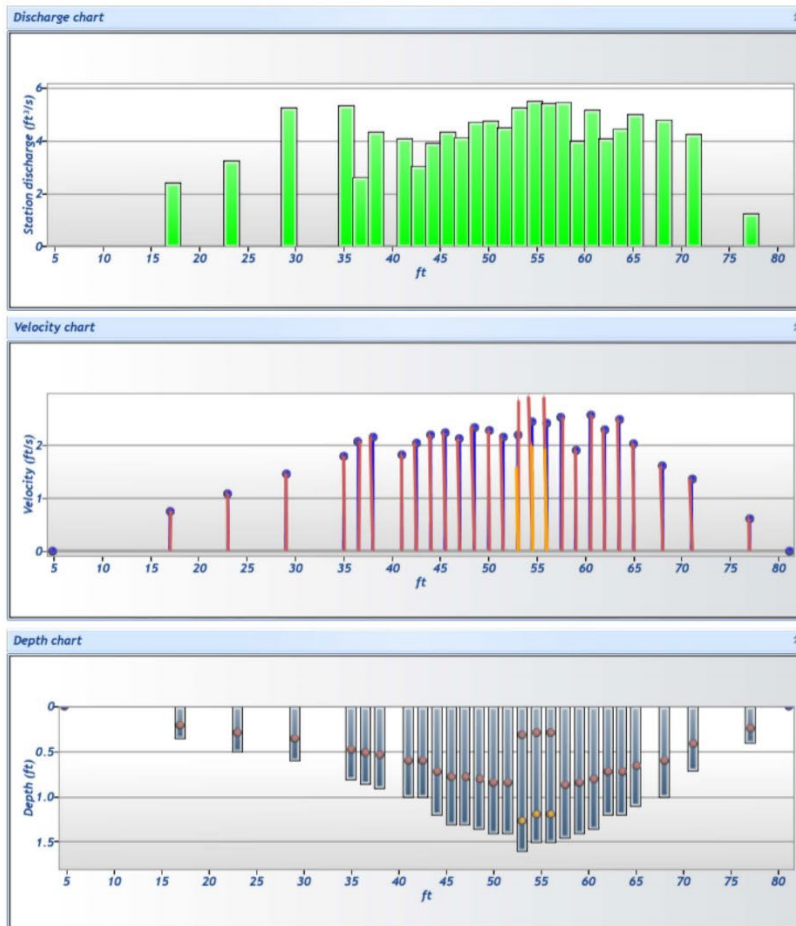
9/15/2025 8:42:59 AM



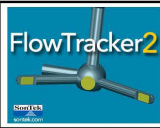
Discharge Measurement Summary

Site name STCK03
Site number 1
Operator(s) DM
File name STCK03_20250912-123824.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



9/15/2025 8:42:59 AM

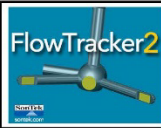


Discharge Measurement Summary

Site name STCK03
Site number 1
Operator(s) DM
File name STCK03_20250912-123824.ft
Comment

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft ²)	Flow (ft ³ /s)	%Q
0	11:44 AM	4.800	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.7600	0.0000	0.0000	0.00
1	11:44 AM	17.000	0.6	0.350	0.6000	0.210	80	0.7600	1.0000	0.7600	3.1850	2.4206	2.17
2	11:46 AM	23.000	0.6	0.500	0.6000	0.300	80	1.0875	1.0000	1.0875	3.0000	3.2626	2.92
3	11:49 AM	29.000	0.6	0.600	0.6000	0.360	80	1.4599	1.0000	1.4599	3.6000	5.2556	4.70
4	11:54 AM	35.000	0.6	0.800	0.6000	0.480	80	1.7880	1.0000	1.7880	3.0000	5.3640	4.80
5	12:21 PM	36.500	0.6	0.850	0.6000	0.510	80	2.0702	1.0000	2.0702	1.2750	2.6395	2.36
6	12:19 PM	38.000	0.6	0.900	0.6000	0.540	80	2.1422	1.0000	2.1422	2.0250	4.3379	3.88
7	11:55 AM	41.000	0.6	1.000	0.6000	0.600	80	1.8204	1.0000	1.8204	2.2500	4.0959	3.67
8	12:23 PM	42.500	0.6	1.000	0.6000	0.600	80	2.0352	1.0000	2.0352	1.5000	3.0528	2.73
9	12:18 PM	44.000	0.6	1.200	0.6000	0.720	80	2.1927	1.0000	2.1927	1.8000	3.9469	3.53
10	12:25 PM	45.500	0.6	1.300	0.6000	0.780	80	2.2293	1.0000	2.2293	1.9500	4.3472	3.89
11	11:57 AM	47.000	0.6	1.300	0.6000	0.780	80	2.1191	1.0000	2.1191	1.9500	4.1323	3.70
12	12:26 PM	48.500	0.6	1.350	0.6000	0.810	80	2.3447	1.0000	2.3447	2.0250	4.7481	4.25
13	12:16 PM	50.000	0.6	1.400	0.6000	0.840	80	2.2810	1.0000	2.2810	2.1000	4.7901	4.29
14	12:28 PM	51.500	0.6	1.400	0.6000	0.840	80	2.1457	1.0000	2.1457	2.1000	4.5059	4.03
15	11:58 AM	53.000	0.2/0.8	1.600	0.2000	0.320	80	2.8319	1.0000	2.1978	2.4000	5.2748	4.72
15	11:58 AM	53.000	0.2/0.8	1.600	0.8000	1.280	80	1.5637	1.0000	2.1978	2.4000	5.2748	4.72
16	12:30 PM	54.500	0.2/0.8	1.500	0.2000	0.300	80	2.9137	1.0000	2.4495	2.2500	5.5113	4.93
16	12:30 PM	54.500	0.2/0.8	1.500	0.8000	1.200	80	1.9852	1.0000	2.4495	2.2500	5.5113	4.93
17	12:13 PM	56.000	0.2/0.8	1.500	0.2000	0.300	80	2.9047	1.0000	2.4141	2.2500	5.4317	4.86
17	12:13 PM	56.000	0.2/0.8	1.500	0.8000	1.200	80	1.9236	1.0000	2.4141	2.2500	5.4317	4.86
18	12:33 PM	57.500	0.6	1.450	0.6000	0.870	80	2.5204	1.0000	2.5204	2.1750	5.4820	4.91
19	12:01 PM	59.000	0.6	1.400	0.6000	0.840	80	1.9076	1.0000	1.9076	2.1000	4.0059	3.59
20	12:35 PM	60.500	0.6	1.350	0.6000	0.810	80	2.5557	1.0000	2.5557	2.0250	5.1753	4.63
21	12:10 PM	62.000	0.6	1.200	0.6000	0.720	80	2.2897	1.0000	2.2897	1.8000	4.1214	3.69
22	12:36 PM	63.500	0.6	1.200	0.6000	0.720	80	2.4797	1.0000	2.4797	1.8000	4.4635	4.00
23	12:03 PM	65.000	0.6	1.100	0.6000	0.660	80	2.0338	1.0000	2.0338	2.4750	5.0338	4.51
24	12:09 PM	68.000	0.6	1.000	0.6000	0.600	80	1.6078	1.0000	1.6078	3.0000	4.8235	4.32
25	12:04 PM	71.000	0.6	0.700	0.6000	0.420	80	1.3516	1.0000	1.3516	3.1500	4.2574	3.81
26	12:06 PM	77.000	0.6	0.400	0.6000	0.240	80	0.6118	1.0000	0.6118	2.0200	1.2359	1.11
27	12:08 PM	81.100	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.6118	0.0000	0.0000	0.00

9/15/2025 8:42:59 AM



Discharge Measurement Summary

Site name STCK03
Site number 1
Operator(s) DM
File name STCK03_20250912-123824.ft
Comment

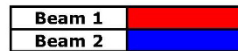
Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	15.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings							
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
5	12:21 PM	36.500	0.6	0.850	0.6000	0.510	Standard Error > QC
6	12:19 PM	38.000	0.6	0.900	0.6000	0.540	Stn Spacing > QC
7	11:55 AM	41.000	0.6	1.000	0.6000	0.600	Standard Error > QC
8	12:23 PM	42.500	0.6	1.000	0.6000	0.600	Standard Error > QC
9	12:18 PM	44.000	0.6	1.200	0.6000	0.720	Standard Error > QC
10	12:25 PM	45.500	0.6	1.300	0.6000	0.780	Standard Error > QC
11	11:57 AM	47.000	0.6	1.300	0.6000	0.780	Standard Error > QC
12	12:26 PM	48.500	0.6	1.350	0.6000	0.810	Standard Error > QC
13	12:16 PM	50.000	0.6	1.400	0.6000	0.840	Standard Error > QC
14	12:28 PM	51.500	0.6	1.400	0.6000	0.840	Standard Error > QC
15	11:58 AM	53.000	0.2/0.8	1.600	0.2000	0.320	Standard Error > QC
15	11:58 AM	53.000	0.2/0.8	1.600	0.8000	1.280	Standard Error > QC
16	12:30 PM	54.500	0.2/0.8	1.500	0.2000	0.300	Standard Error > QC
16	12:30 PM	54.500	0.2/0.8	1.500	0.8000	1.200	Standard Error > QC
17	12:13 PM	56.000	0.2/0.8	1.500	0.2000	0.300	Standard Error > QC
17	12:13 PM	56.000	0.2/0.8	1.500	0.8000	1.200	Standard Error > QC
18	12:33 PM	57.500	0.6	1.450	0.6000	0.870	Standard Error > QC
19	12:01 PM	59.000	0.6	1.400	0.6000	0.840	Standard Error > QC
20	12:35 PM	60.500	0.6	1.350	0.6000	0.810	Standard Error > QC
21	12:10 PM	62.000	0.6	1.200	0.6000	0.720	Standard Error > QC
22	12:36 PM	63.500	0.6	1.200	0.6000	0.720	Standard Error > QC
23	12:03 PM	65.000	0.6	1.100	0.6000	0.660	Standard Error > QC
24	12:09 PM	68.000	0.6	1.000	0.6000	0.600	Standard Error > QC

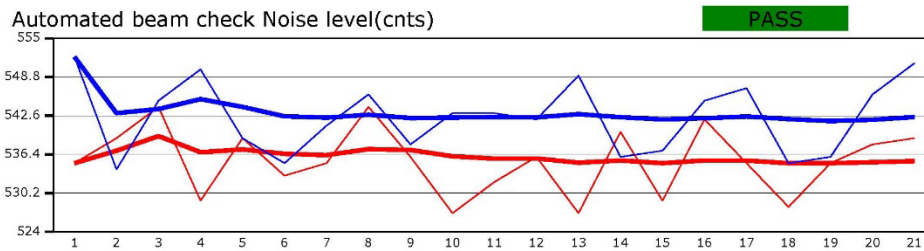
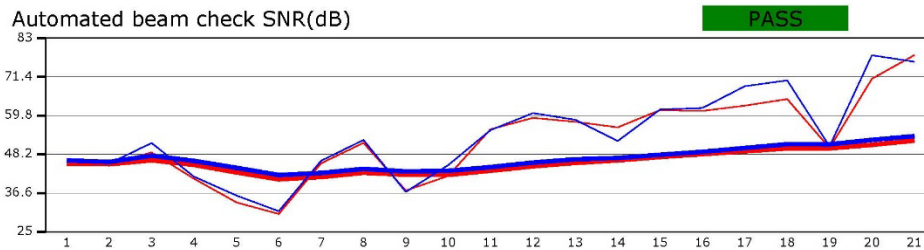
9/15/2025 8:42:59 AM

Discharge Measurement Summary

Site name	STCK03
Site number	1
Operator(s)	DM
File name	STCK03_20250912-123824.ft
Comment	

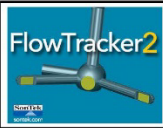


Automated beam check Start time 9/12/2025 11:44:14 AM



Automated beam check Quality control warnings
No quality control warnings

9/15/2025 8:42:59 AM

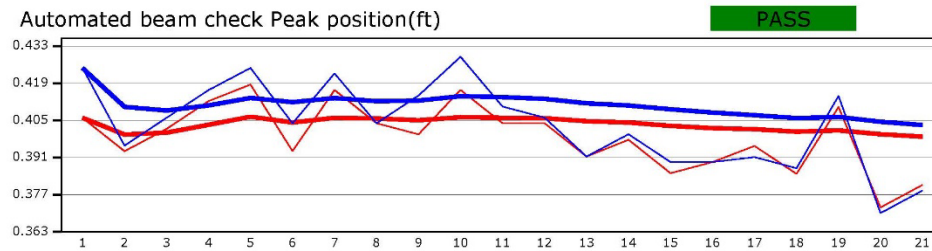
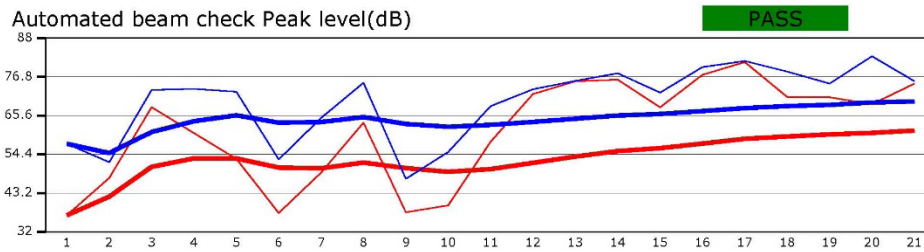


Discharge Measurement Summary

Site name STCK03
Site number 1
Operator(s) DM
File name STCK03_20250912-123824.ft
Comment

Beam 1	
Beam 2	

Automated beam check Start time 9/12/2025 11:44:14 AM



Automated beam check Quality control warnings
 No quality control warnings

9/15/2025 8:42:59 AM

6.1.1.3 MI STSP06

	Discharge Measurement Summary
---	---

Site name	STSP06
Site number	1
Operator(s)	
File name	STSP06_20250827-171208.ft
Comment	

Start time 8/27/2025 3:54 PM End time 8/27/2025 5:00 PM Start location latitude 39.750 Start location longitude -122.125 Calculations engine FlowTracker2	Sensor type Top Setting Handheld serial number FT2H2126012 Probe serial number FT2P2127007 Probe firmware 1.30 Handheld software 2.0
--	---

# Stations	Avg interval (s)	Total discharge (ft³/s)
22	40	28.7473

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
14.100	18.3775	14.907

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
50	1.303	1.5643

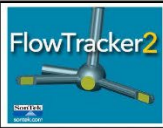
Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
85.148	1.700	2.0059

Discharge Uncertainty			Discharge equation		Mid Section
Category	ISO	IVE	Discharge uncertainty		IVE
Accuracy	1.0%	1.0%	Discharge reference		Rated
Depth	0.2%	1.7%			
Velocity	0.3%	1.1%			
Width	0.1%	0.1%			
Method	1.2%				
# Stations	2.3%				
Overall	2.8%	2.2%			

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview
No changes were made to this file
Quality control warnings

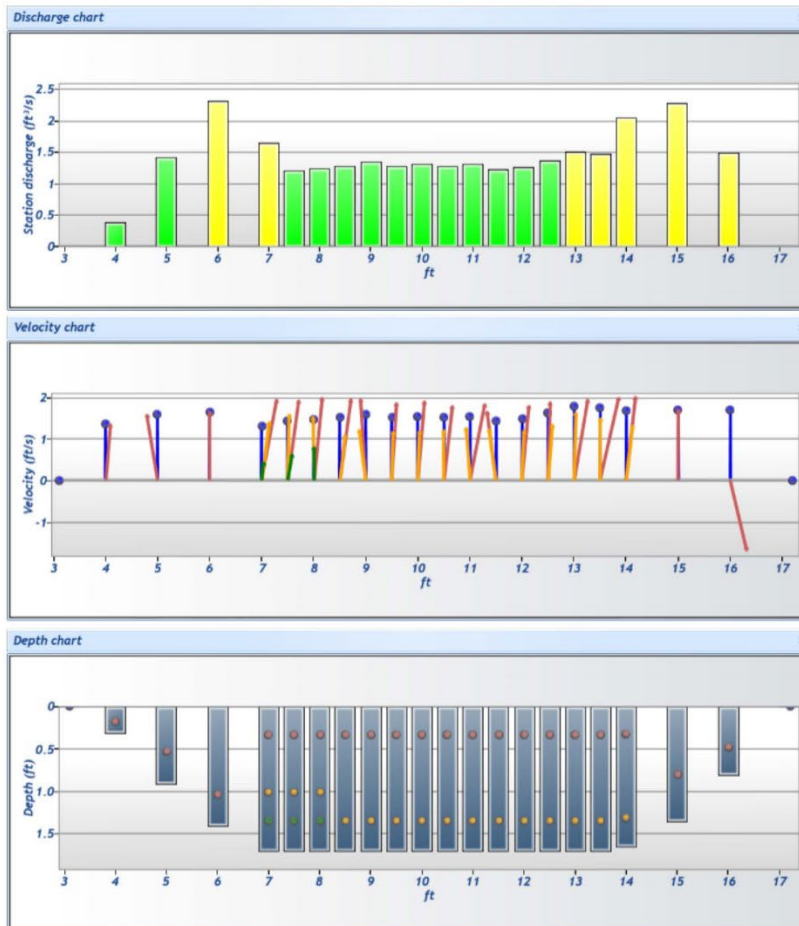
8/28/2025 9:05:20 AM



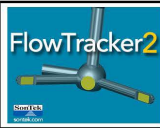
Discharge Measurement Summary

Site name STSP06
Site number 1
Operator(s)
File name STSP06_20250827-171208.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



8/28/2025 9:05:20 AM



Discharge Measurement Summary

Site name STSP06
Site number 1
Operator(s)
File name STSP06_20250827-171208.ft
Comment

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correcti on	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q
0	3:54 PM	3.100	None	0.000	0.0000	0.000	0	0.0000	1.0000	1.3579	0.0000	0.0000	0.00
1	3:58 PM	4.000	0.6	0.300	0.6000	0.180	80	1.3579	1.0000	1.3579	0.2850	0.3870	1.35
2	4:02 PM	5.000	0.6	0.900	0.6000	0.540	80	1.5796	1.0000	1.5796	0.9000	1.4216	4.95
3	4:06 PM	6.000	0.6	1.400	0.6000	1.040	80	1.6518	1.0000	1.6518	1.4000	2.3125	8.04
4	4:09 PM	7.000	0.2/0.6/0.8	1.700	0.2000	0.340	80	1.9410	1.0000	1.2976	1.2750	1.6544	5.75
4	4:09 PM	7.000	0.2/0.6/0.8	1.700	0.6000	1.020	80	1.4048	1.0000	1.2976	1.2750	1.6544	5.75
4	4:09 PM	7.000	0.2/0.6/0.8	1.700	0.8000	1.360	80	0.4397	1.0000	1.2976	1.2750	1.6544	5.75
5	5:00 PM	7.500	0.2/0.6/0.8	1.700	0.2000	0.340	80	1.9252	1.0000	1.4300	0.8500	1.2155	4.23
5	5:00 PM	7.500	0.2/0.6/0.8	1.700	0.6000	1.020	80	1.5858	1.0000	1.4300	0.8500	1.2155	4.23
5	5:00 PM	7.500	0.2/0.6/0.8	1.700	0.8000	1.360	80	0.6234	1.0000	1.4300	0.8500	1.2155	4.23
6	4:12 PM	8.000	0.2/0.6/0.8	1.700	0.2000	0.340	80	1.9857	1.0000	1.4612	0.8500	1.2420	4.32
6	4:12 PM	8.000	0.2/0.6/0.8	1.700	0.6000	1.020	80	1.5304	1.0000	1.4612	0.8500	1.2420	4.32
6	4:12 PM	8.000	0.2/0.6/0.8	1.700	0.8000	1.360	80	0.7982	1.0000	1.4612	0.8500	1.2420	4.32
7	4:57 PM	8.500	0.2/0.8	1.700	0.2000	0.340	80	1.9457	1.0000	1.5170	0.8500	1.2895	4.49
7	4:57 PM	8.500	0.2/0.8	1.700	0.8000	1.360	80	1.0883	1.0000	1.5170	0.8500	1.2895	4.49
8	4:17 PM	9.000	0.2/0.8	1.700	0.2000	0.340	80	1.9454	1.0000	1.5823	0.8500	1.3449	4.68
8	4:17 PM	9.000	0.2/0.8	1.700	0.8000	1.360	80	1.2192	1.0000	1.5823	0.8500	1.3449	4.68
9	4:55 PM	9.500	0.2/0.8	1.700	0.2000	0.340	80	1.8544	1.0000	1.5156	0.8500	1.2883	4.48
9	4:55 PM	9.500	0.2/0.8	1.700	0.8000	1.360	80	1.1769	1.0000	1.5156	0.8500	1.2883	4.48
10	4:19 PM	10.000	0.2/0.8	1.700	0.2000	0.340	80	1.9030	1.0000	1.5443	0.8500	1.3127	4.57
10	4:19 PM	10.000	0.2/0.8	1.700	0.8000	1.360	80	1.1857	1.0000	1.5443	0.8500	1.3127	4.57
11	4:53 PM	10.500	0.2/0.8	1.700	0.2000	0.340	80	1.7853	1.0000	1.4989	0.8500	1.2741	4.43
11	4:53 PM	10.500	0.2/0.8	1.700	0.8000	1.360	80	1.2126	1.0000	1.4989	0.8500	1.2741	4.43
12	4:22 PM	11.000	0.2/0.8	1.700	0.2000	0.340	80	1.8342	1.0000	1.5466	0.8500	1.3146	4.57
12	4:22 PM	11.000	0.2/0.8	1.700	0.8000	1.360	80	1.2590	1.0000	1.5466	0.8500	1.3146	4.57
13	4:50 PM	11.500	0.2/0.8	1.700	0.2000	0.340	80	1.6483	1.0000	1.4364	0.8500	1.2209	4.25
13	4:50 PM	11.500	0.2/0.8	1.700	0.8000	1.360	80	1.2244	1.0000	1.4364	0.8500	1.2209	4.25
14	4:25 PM	12.000	0.2/0.8	1.700	0.2000	0.340	80	1.7932	1.0000	1.4970	0.8500	1.2725	4.43
14	4:25 PM	12.000	0.2/0.8	1.700	0.8000	1.360	80	1.2008	1.0000	1.4970	0.8500	1.2725	4.43
15	4:48 PM	12.500	0.2/0.8	1.700	0.2000	0.340	80	1.8823	1.0000	1.6109	0.8500	1.3693	4.76
15	4:48 PM	12.500	0.2/0.8	1.700	0.8000	1.360	80	1.3396	1.0000	1.6109	0.8500	1.3693	4.76
16	4:28 PM	13.000	0.2/0.8	1.700	0.2000	0.340	80	1.9396	1.0000	1.7837	0.8500	1.5161	5.27
16	4:28 PM	13.000	0.2/0.8	1.700	0.8000	1.360	80	1.6278	1.0000	1.7837	0.8500	1.5161	5.27
17	4:45 PM	13.500	0.2/0.8	1.700	0.2000	0.340	80	1.9860	1.0000	1.7378	0.8500	1.4772	5.14
17	4:45 PM	13.500	0.2/0.8	1.700	0.8000	1.360	80	1.4897	1.0000	1.7378	0.8500	1.4772	5.14
18	4:31 PM	14.000	0.2/0.8	1.650	0.2000	0.330	80	2.0059	1.0000	1.6611	1.2375	2.0556	7.15
18	4:31 PM	14.000	0.2/0.8	1.650	0.8000	1.320	80	1.3163	1.0000	1.6611	1.2375	2.0556	7.15
19	4:37 PM	15.000	0.6	1.350	0.6000	0.810	80	1.6959	1.0000	1.6959	1.3500	2.2894	7.96
20	4:40 PM	16.000	0.6	0.800	0.6000	0.480	80	-1.6922	-1.0000	1.6922	0.8800	1.4891	5.18
21	4:43 PM	17.200	None	0.000	0.0000	0.000	0	0.0000	1.0000	1.6922	0.0000	0.0000	0.00

8/28/2025 9:05:20 AM



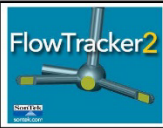
Discharge Measurement Summary

Site name STSP06
Site number 1
Operator(s)
File name STSP06_20250827-171208.ft
Comment

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	15.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings							
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
5	5:00 PM	7.500	0.2/0.6/0.8	1.700	0.2000	0.340	Standard Error > QC
5	5:00 PM	7.500	0.2/0.6/0.8	1.700	0.6000	1.020	Standard Error > QC
5	5:00 PM	7.500	0.2/0.6/0.8	1.700	0.8000	1.360	Standard Error > QC
6	4:12 PM	8.000	0.2/0.6/0.8	1.700	0.2000	0.340	Standard Error > QC
6	4:12 PM	8.000	0.2/0.6/0.8	1.700	0.6000	1.020	Standard Error > QC
6	4:12 PM	8.000	0.2/0.6/0.8	1.700	0.8000	1.360	Standard Error > QC
8	4:17 PM	9.000	0.2/0.8	1.700	0.2000	0.340	Standard Error > QC
8	4:17 PM	9.000	0.2/0.8	1.700	0.8000	1.360	Standard Error > QC
9	4:55 PM	9.500	0.2/0.8	1.700	0.2000	0.340	Standard Error > QC
9	4:55 PM	9.500	0.2/0.8	1.700	0.8000	1.360	Standard Error > QC
10	4:19 PM	10.000	0.2/0.8	1.700	0.2000	0.340	Standard Error > QC
10	4:19 PM	10.000	0.2/0.8	1.700	0.8000	1.360	Standard Error > QC
11	4:53 PM	10.500	0.2/0.8	1.700	0.2000	0.340	Standard Error > QC
11	4:53 PM	10.500	0.2/0.8	1.700	0.8000	1.360	Standard Error > QC
12	4:22 PM	11.000	0.2/0.8	1.700	0.2000	0.340	Standard Error > QC
12	4:22 PM	11.000	0.2/0.8	1.700	0.8000	1.360	Standard Error > QC
17	4:45 PM	13.500	0.2/0.8	1.700	0.2000	0.340	Standard Error > QC
17	4:45 PM	13.500	0.2/0.8	1.700	0.8000	1.360	Standard Error > QC
18	4:31 PM	14.000	0.2/0.8	1.650	0.2000	0.330	Standard Error > QC
18	4:31 PM	14.000	0.2/0.8	1.650	0.8000	1.320	Standard Error > QC
20	4:40 PM	16.000	0.6	0.800	0.6000	0.480	Velocity Angle > QC
21	4:43 PM	17.200	None	0.000	0.0000	0.000	Water Depth > QC

8/28/2025 9:05:20 AM

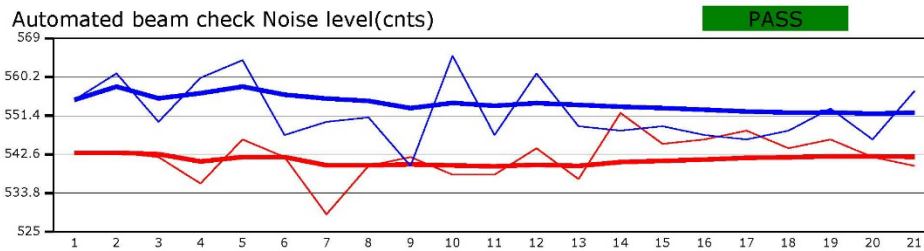
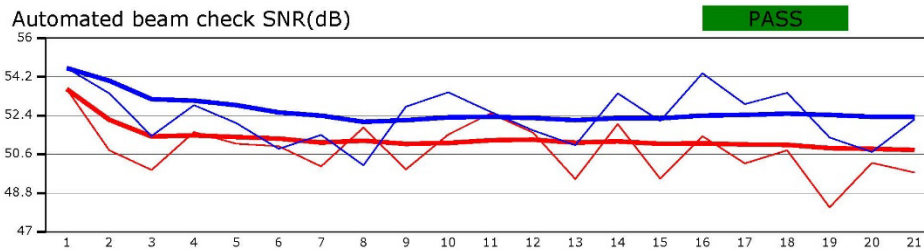


Discharge Measurement Summary

Site name STSP06
Site number 1
Operator(s)
File name STSP06_20250827-171208.ft
Comment

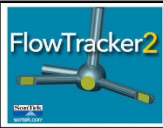
Beam 1	
Beam 2	

Automated beam check Start time 8/27/2025 3:53:33 PM



Automated beam check Quality control warnings
 No quality control warnings

8/28/2025 9:05:20 AM

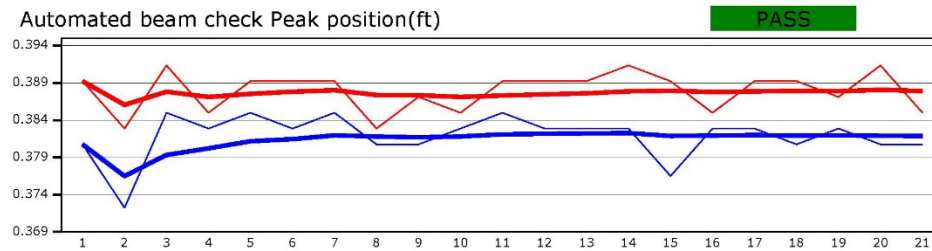
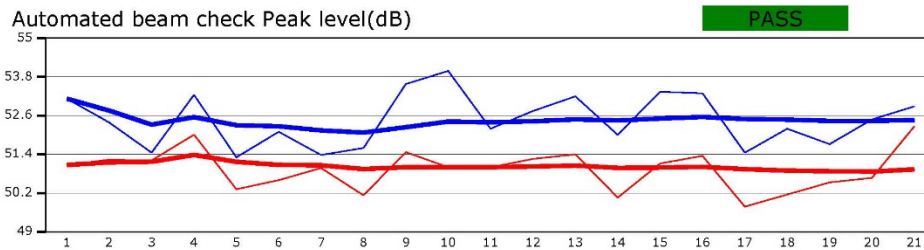


Discharge Measurement Summary

Site name STSP06
Site number 1
Operator(s)
File name STSP06_20250827-171208.ft
Comment

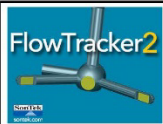
Beam 1	
Beam 2	

Automated beam check Start time 8/27/2025 3:53:33 PM



Automated beam check Quality control warnings
 No quality control warnings

8/28/2025 9:05:20 AM



Discharge Measurement Summary

Site name STSP06
Site number 1
Operator(s)
File name STSP06_20250912-165522.ft
Comment

Start time	9/12/2025 3:53 PM	Sensor type	Top Setting
End time	9/12/2025 4:52 PM	Handheld serial number	FT2H2126012
Start location latitude	39.750	Probe serial number	FT2P2127007
Start location longitude	-122.125	Probe firmware	1.30
Calculations engine	FlowTracker2	Handheld software	2.0

# Stations	Avg interval (s)	Total discharge (ft³/s)
24	40	14.3536

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
17.700	32.0875	18.963

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
42	1.813	0.4473

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
82.113	2.600	0.6491

Discharge Uncertainty		
Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.1%	1.1%
Velocity	0.2%	1.9%
Width	0.1%	0.1%
Method	0.8%	
# Stations	2.1%	
Overall	2.5%	2.4%

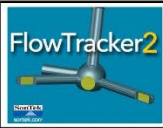
Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview

No changes were made to this file
 Quality control warnings

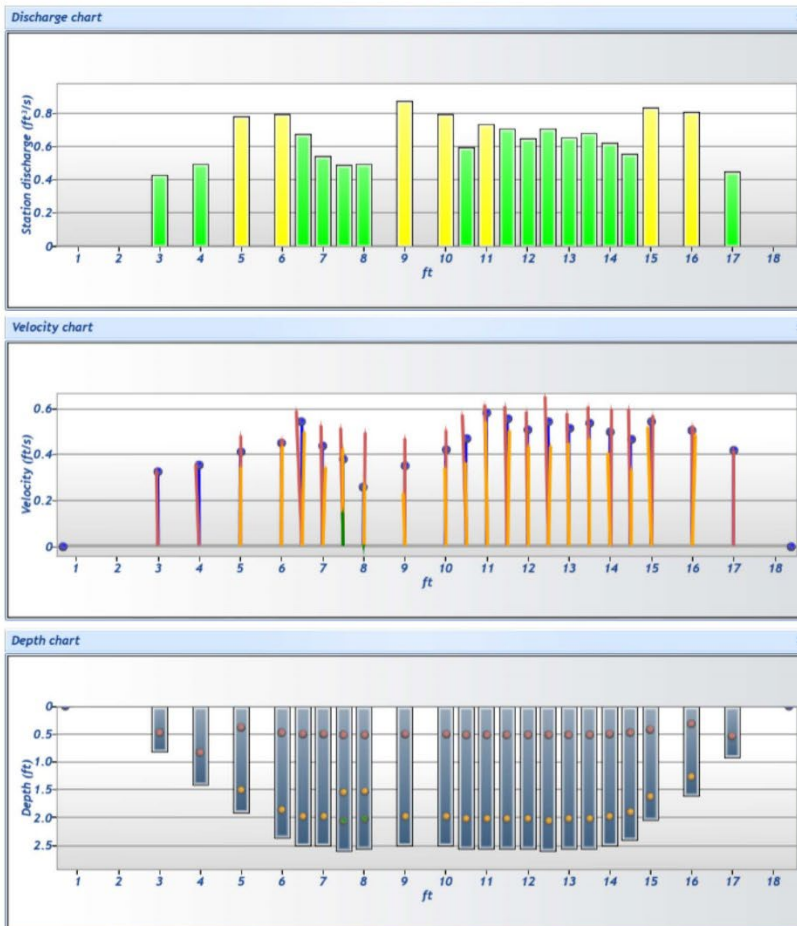
9/15/2025 8:45:50 AM



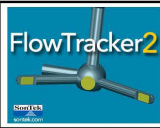
Discharge Measurement Summary

Site name STSP06
Site number 1
Operator(s)
File name STSP06_20250912-165522.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



9/15/2025 8:45:50 AM



Discharge Measurement Summary

Site name STSP06
Site number 1
Operator(s)
File name STSP06_20250912-165522.ft
Comment

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correcti on	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q
0	3:53 PM	0.700	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.3257	0.0000	0.0000	0.00
1	3:54 PM	3.000	0.6	0.800	0.6000	0.480	80	0.3257	1.0000	0.3257	1.3200	0.4299	2.99
2	3:56 PM	4.000	0.6	1.400	0.6000	0.840	80	0.3541	1.0000	0.3541	1.4000	0.4957	3.45
3	3:59 PM	5.000	0.2/0.8	1.900	0.2000	0.380	80	0.4791	1.0000	0.4100	1.9000	0.7790	5.43
3	3:59 PM	5.000	0.2/0.8	1.900	0.8000	1.520	80	0.3410	1.0000	0.4100	1.9000	0.7790	5.43
4	4:02 PM	6.000	0.2/0.8	2.350	0.2000	0.470	80	0.4652	1.0000	0.4489	1.7625	0.7912	5.51
4	4:02 PM	6.000	0.2/0.8	2.350	0.8000	1.880	80	0.4326	1.0000	0.4489	1.7625	0.7912	5.51
5	4:52 PM	6.500	0.2/0.8	2.500	0.2000	0.500	80	0.5878	1.0000	0.5419	1.2500	0.6773	4.72
5	4:52 PM	6.500	0.2/0.8	2.500	0.8000	2.000	80	0.4959	1.0000	0.5419	1.2500	0.6773	4.72
6	4:04 PM	7.000	0.2/0.8	2.500	0.2000	0.500	80	0.5236	1.0000	0.4327	1.2500	0.5409	3.77
6	4:04 PM	7.000	0.2/0.8	2.500	0.8000	2.000	80	0.3418	1.0000	0.4327	1.2500	0.5409	3.77
7	4:38 PM	7.500	0.2/0.6/0.8	2.600	0.2000	0.520	80	0.5129	1.0000	0.3761	1.3000	0.4890	3.41
7	4:38 PM	7.500	0.2/0.6/0.8	2.600	0.6000	1.560	80	0.4226	1.0000	0.3761	1.3000	0.4890	3.41
7	4:38 PM	7.500	0.2/0.6/0.8	2.600	0.8000	2.080	80	0.1466	1.0000	0.3761	1.3000	0.4890	3.41
8	4:06 PM	8.000	0.2/0.6/0.8	2.550	0.2000	0.510	80	0.4938	1.0000	0.2586	1.9125	0.4946	3.45
8	4:06 PM	8.000	0.2/0.6/0.8	2.550	0.6000	1.530	80	0.2680	1.0000	0.2586	1.9125	0.4946	3.45
8	4:06 PM	8.000	0.2/0.6/0.8	2.550	0.8000	2.040	80	0.0048	1.0000	0.2586	1.9125	0.4946	3.45
9	4:10 PM	9.000	0.2/0.8	2.500	0.2000	0.500	80	0.4673	1.0000	0.3482	2.5000	0.8704	6.06
9	4:10 PM	9.000	0.2/0.8	2.500	0.8000	2.000	80	0.2290	1.0000	0.3482	2.5000	0.8704	6.06
10	4:12 PM	10.000	0.2/0.8	2.500	0.2000	0.500	80	0.5035	1.0000	0.4215	1.8750	0.7904	5.51
10	4:12 PM	10.000	0.2/0.8	2.500	0.8000	2.000	80	0.3396	1.0000	0.4215	1.8750	0.7904	5.51
11	4:35 PM	10.500	0.2/0.8	2.550	0.2000	0.510	80	0.5708	1.0000	0.4669	1.2750	0.5953	4.15
11	4:35 PM	10.500	0.2/0.8	2.550	0.8000	2.040	80	0.3630	1.0000	0.4669	1.2750	0.5953	4.15
12	4:14 PM	11.000	0.2/0.8	2.550	0.2000	0.510	80	0.6134	1.0000	0.5776	1.2750	0.7364	5.13
12	4:14 PM	11.000	0.2/0.8	2.550	0.8000	2.040	80	0.5418	1.0000	0.5776	1.2750	0.7364	5.13
13	4:32 PM	11.500	0.2/0.8	2.550	0.2000	0.510	80	0.6077	1.0000	0.5547	1.2750	0.7073	4.93
13	4:32 PM	11.500	0.2/0.8	2.550	0.8000	2.040	80	0.5017	1.0000	0.5547	1.2750	0.7073	4.93
14	4:16 PM	12.000	0.2/0.8	2.550	0.2000	0.510	80	0.5839	1.0000	0.5083	1.2750	0.6481	4.52
14	4:16 PM	12.000	0.2/0.8	2.550	0.8000	2.040	80	0.4327	1.0000	0.5083	1.2750	0.6481	4.52
15	4:49 PM	12.500	0.2/0.8	2.600	0.2000	0.520	80	0.6491	1.0000	0.5419	1.3000	0.7045	4.91
15	4:49 PM	12.500	0.2/0.8	2.600	0.8000	2.080	80	0.4347	1.0000	0.5419	1.3000	0.7045	4.91
16	4:18 PM	13.000	0.2/0.8	2.550	0.2000	0.510	80	0.5773	1.0000	0.5125	1.2750	0.6535	4.55
16	4:18 PM	13.000	0.2/0.8	2.550	0.8000	2.040	80	0.4478	1.0000	0.5125	1.2750	0.6535	4.55
17	4:43 PM	13.500	0.2/0.8	2.550	0.2000	0.510	80	0.6059	1.0000	0.5355	1.2750	0.6828	4.76
17	4:43 PM	13.500	0.2/0.8	2.550	0.8000	2.040	80	0.4652	1.0000	0.5355	1.2750	0.6828	4.76
18	4:20 PM	14.000	0.2/0.8	2.500	0.2000	0.500	80	0.5937	1.0000	0.4994	1.2500	0.6242	4.35
18	4:20 PM	14.000	0.2/0.8	2.500	0.8000	2.000	80	0.4050	1.0000	0.4994	1.2500	0.6242	4.35
19	4:46 PM	14.500	0.2/0.8	2.400	0.2000	0.480	80	0.5952	1.0000	0.4628	1.2000	0.5554	3.87
19	4:46 PM	14.500	0.2/0.8	2.400	0.8000	1.920	80	0.3304	1.0000	0.4628	1.2000	0.5554	3.87
20	4:23 PM	15.000	0.2/0.8	2.050	0.2000	0.410	80	0.5682	1.0000	0.5424	1.5375	0.8339	5.81
20	4:23 PM	15.000	0.2/0.8	2.050	0.8000	1.640	80	0.5166	1.0000	0.5424	1.5375	0.8339	5.81
21	4:26 PM	16.000	0.2/0.8	1.600	0.2000	0.320	80	0.5236	1.0000	0.5031	1.6000	0.8050	5.61
21	4:26 PM	16.000	0.2/0.8	1.600	0.8000	1.280	80	0.4827	1.0000	0.5031	1.6000	0.8050	5.61
22	4:29 PM	17.000	0.6	0.900	0.6000	0.540	80	0.4155	1.0000	0.4155	1.0800	0.4487	3.13
23	4:31 PM	18.400	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.4155	0.0000	0.0000	0.00

9/15/2025 8:45:50 AM

Discharge Measurement Summary

Site name	STSP06
Site number	1
Operator(s)	
File name	STSP06_20250912-165522.ft
Comment	

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	15.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings							
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
23	4:31 PM	18.400	None	0.000	0.0000	0.000	Water Depth > QC

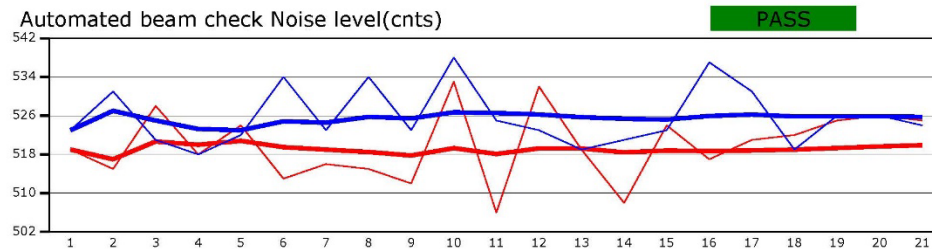
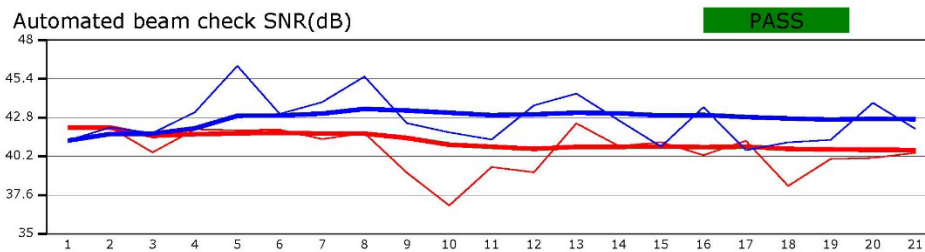
9/15/2025 8:45:50 AM

Discharge Measurement Summary

Site name	STSP06
Site number	1
Operator(s)	
File name	STSP06_20250912-165522.ft
Comment	

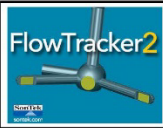
Beam 1	
Beam 2	

Automated beam check Start time 9/12/2025 3:53:10 PM



Automated beam check Quality control warnings No quality control warnings

9/15/2025 8:45:50 AM

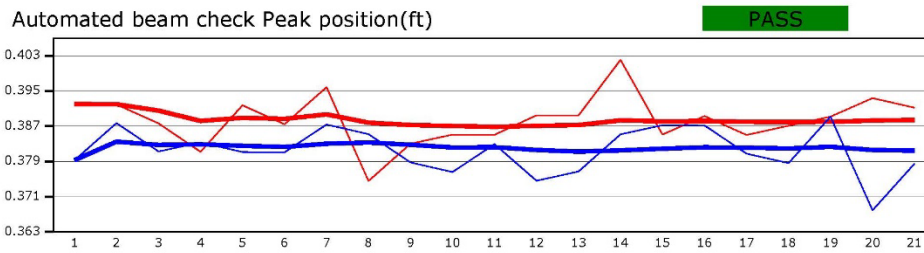
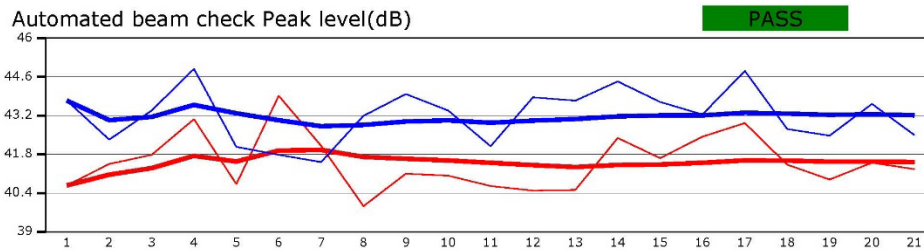


Discharge Measurement Summary

Site name STSP06
Site number 1
Operator(s)
File name STSP06_20250912-165522.ft
Comment

Beam 1	
Beam 2	

Automated beam check Start time 9/12/2025 3:53:10 PM



Automated beam check Quality control warnings
 No quality control warnings

9/15/2025 8:45:50 AM

6.1.1.4 STCK04

Discharge Measurement Summary

Site name	STCK04
Site number	1
Operator(s)	
File name	STCK04_20250822-180603.ft
Comment	

Start time	8/22/2025 4:27 PM	Sensor type	Top Setting
End time	8/22/2025 5:48 PM	Handheld serial number	FT2H2126012
Start location latitude	39.743	Probe serial number	FT2P2127007
Start location longitude	-122.095	Probe firmware	1.30
Calculations engine	FlowTracker2	Handheld software	2.0

# Stations	Avg interval (s)	Total discharge (ft³/s)
34	40	85.7074

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
74.800	112.7525	75.239

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
31	1.507	0.7601

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
87.998	2.300	1.1232

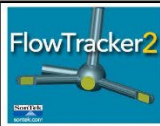
Discharge Uncertainty		
Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.1%	1.0%
Velocity	0.2%	0.8%
Width	0.1%	0.1%
Method	0.7%	
# Stations	1.5%	
Overall	2.0%	1.6%

Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview
No changes were made to this file

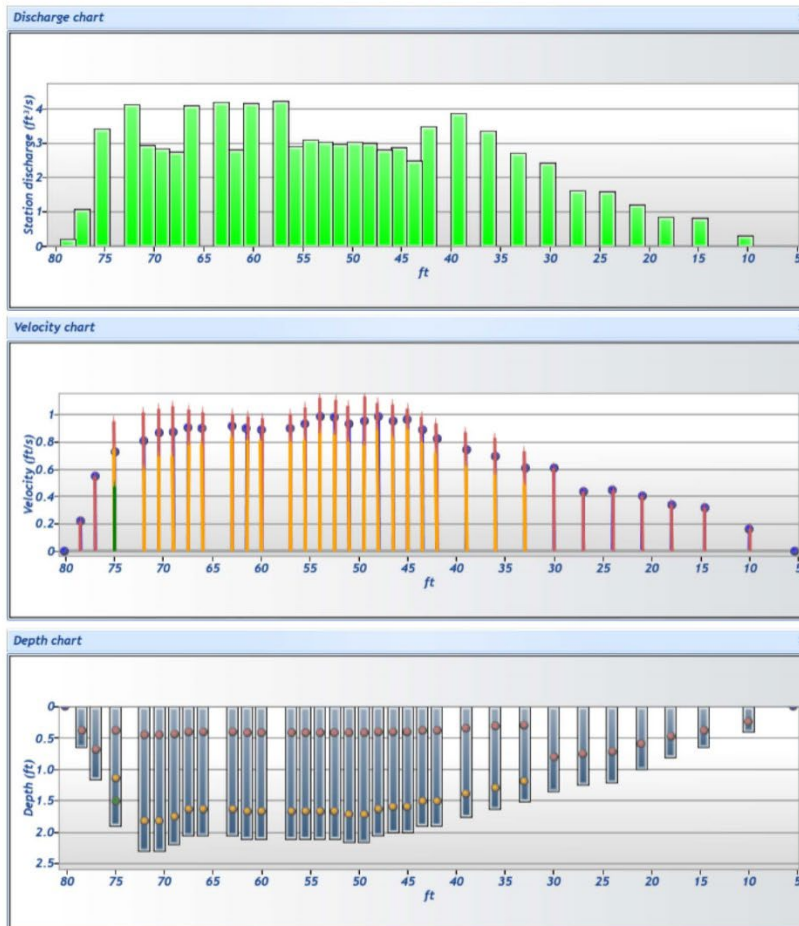
8/25/2025 9:48:38 AM



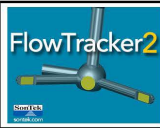
Discharge Measurement Summary

Site name STCK04
Site number 1
Operator(s)
File name STCK04_20250822-180603.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



8/25/2025 9:48:38 AM



Discharge Measurement Summary

Site name STCK04
Site number 1
Operator(s)
File name STCK04_20250822-180603.ft
Comment

Measurement results															
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft ²)	Flow (ft ³ /s)	%Q		
0	4:27 PM	5.400	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.1651	0.0000	0.0000	0.00	✓	
1	4:30 PM	10.000	0.6	0.400	0.6000	0.240	80	0.1651	1.0000	0.1651	1.8400	0.3038	0.35	✓	
2	4:31 PM	14.600	0.6	0.650	0.6000	0.390	80	0.3171	1.0000	0.3171	2.6000	0.8245	0.96	✓	
3	4:33 PM	18.000	0.6	0.800	0.6000	0.480	80	0.3382	1.0000	0.3382	2.5600	0.8657	1.01	✓	
4	4:34 PM	21.000	0.6	1.000	0.6000	0.600	80	0.4011	1.0000	0.4011	3.0000	1.2034	1.40	✓	
5	4:36 PM	24.000	0.6	1.200	0.6000	0.720	80	0.4443	1.0000	0.4443	3.6000	1.5996	1.87	✓	
6	4:38 PM	27.000	0.6	1.250	0.6000	0.750	80	0.4324	1.0000	0.4324	3.7500	1.6214	1.89	✓	
7	4:39 PM	30.000	0.6	1.350	0.6000	0.810	80	0.6056	1.0000	0.6056	4.0500	2.4525	2.86	✓	
8	4:40 PM	33.000	0.2/0.8	1.500	0.2000	0.300	80	0.7253	1.0000	0.6036	4.5000	2.7163	3.17	✓	
8	4:40 PM	33.000	0.2/0.8	1.500	0.8000	1.200	80	0.4819	1.0000	0.6036	4.5000	2.7163	3.17	✓	
9	4:43 PM	36.000	0.2/0.8	1.625	0.2000	0.325	80	0.8226	1.0000	0.6909	4.8750	3.3680	3.93	✓	
9	4:43 PM	36.000	0.2/0.8	1.625	0.8000	1.300	80	0.5591	1.0000	0.6909	4.8750	3.3680	3.93	✓	
10	4:46 PM	39.000	0.2/0.8	1.750	0.2000	0.350	80	0.8650	1.0000	0.7398	5.2500	3.8837	4.53	✓	
10	4:46 PM	39.000	0.2/0.8	1.750	0.8000	1.400	80	0.6146	1.0000	0.7398	5.2500	3.8837	4.53	✓	
11	4:49 PM	42.000	0.2/0.8	1.900	0.2000	0.380	80	0.9288	1.0000	0.8195	4.2750	3.5034	4.09	✓	
11	4:49 PM	42.000	0.2/0.8	1.900	0.8000	1.520	80	0.7102	1.0000	0.8195	4.2750	3.5034	4.09	✓	
12	5:31 PM	43.500	0.2/0.8	1.900	0.2000	0.380	80	0.9773	1.0000	0.8828	2.8500	2.5161	2.94	✓	
12	5:31 PM	43.500	0.2/0.8	1.900	0.8000	1.520	80	0.7884	1.0000	0.8828	2.8500	2.5161	2.94	✓	
13	4:51 PM	45.000	0.2/0.8	2.000	0.2000	0.400	80	1.0362	1.0000	0.9609	3.0000	2.8826	3.36	✓	
13	4:51 PM	45.000	0.2/0.8	2.000	0.8000	1.600	80	0.8855	1.0000	0.9609	3.0000	2.8826	3.36	✓	
14	5:34 PM	46.500	0.2/0.8	2.000	0.2000	0.400	80	1.0653	1.0000	0.9454	3.0000	2.8361	3.31	✓	
14	5:34 PM	46.500	0.2/0.8	2.000	0.8000	1.600	80	0.8254	1.0000	0.9454	3.0000	2.8361	3.31	✓	
15	4:54 PM	48.000	0.2/0.8	2.050	0.2000	0.410	80	1.0761	1.0000	0.9772	3.0750	3.0050	3.51	✓	
15	4:54 PM	48.000	0.2/0.8	2.050	0.8000	1.640	80	0.8784	1.0000	0.9772	3.0750	3.0050	3.51	✓	
16	5:37 PM	49.500	0.2/0.8	2.150	0.2000	0.430	80	1.1232	1.0000	0.9459	3.2250	3.0505	3.56	✓	
16	5:37 PM	49.500	0.2/0.8	2.150	0.8000	1.720	80	0.7685	1.0000	0.9459	3.2250	3.0505	3.56	✓	
17	4:56 PM	51.000	0.2/0.8	2.150	0.2000	0.430	80	1.0554	1.0000	0.9237	3.2250	2.9789	3.48	✓	
17	4:56 PM	51.000	0.2/0.8	2.150	0.8000	1.720	80	0.7920	1.0000	0.9237	3.2250	2.9789	3.48	✓	
18	5:40 PM	52.500	0.2/0.8	2.100	0.2000	0.420	80	1.0968	1.0000	0.9713	3.1500	3.0595	3.57	✓	
18	5:40 PM	52.500	0.2/0.8	2.100	0.8000	1.680	80	0.8457	1.0000	0.9713	3.1500	3.0595	3.57	✓	
19	4:59 PM	54.000	0.2/0.8	2.100	0.2000	0.420	80	1.1142	1.0000	0.9842	3.1500	3.1003	3.62	✓	
19	4:59 PM	54.000	0.2/0.8	2.100	0.8000	1.680	80	0.8542	1.0000	0.9842	3.1500	3.1003	3.62	✓	
20	5:42 PM	55.500	0.2/0.8	2.100	0.2000	0.420	80	1.0432	1.0000	0.9249	3.1500	2.9133	3.40	✓	
20	5:42 PM	55.500	0.2/0.8	2.100	0.8000	1.680	80	0.8065	1.0000	0.9249	3.1500	2.9133	3.40	✓	
21	5:02 PM	57.000	0.2/0.8	2.100	0.2000	0.420	80	0.9956	1.0000	0.8943	4.7250	4.2258	4.93	✓	
21	5:02 PM	57.000	0.2/0.8	2.100	0.8000	1.680	80	0.7931	1.0000	0.8943	4.7250	4.2258	4.93	✓	
22	5:05 PM	60.000	0.2/0.8	2.100	0.2000	0.420	80	0.9652	1.0000	0.8828	4.7250	4.1711	4.87	✓	
22	5:05 PM	60.000	0.2/0.8	2.100	0.8000	1.680	80	0.8004	1.0000	0.8828	4.7250	4.1711	4.87	✓	
23	5:45 PM	61.500	0.2/0.8	2.100	0.2000	0.420	80	0.9795	1.0000	0.8934	3.1500	2.8141	3.28	✓	
23	5:45 PM	61.500	0.2/0.8	2.100	0.8000	1.680	80	0.8072	1.0000	0.8934	3.1500	2.8141	3.28	✓	
24	5:07 PM	63.000	0.2/0.8	2.050	0.2000	0.410	80	0.9947	1.0000	0.9095	4.6125	4.1952	4.89	✓	
24	5:07 PM	63.000	0.2/0.8	2.050	0.8000	1.640	80	0.8244	1.0000	0.9095	4.6125	4.1952	4.89	✓	
25	5:10 PM	66.000	0.2/0.8	2.050	0.2000	0.410	80	1.0092	1.0000	0.8909	4.6125	4.1094	4.79	✓	
25	5:10 PM	66.000	0.2/0.8	2.050	0.8000	1.640	80	0.7727	1.0000	0.8909	4.6125	4.1094	4.79	✓	
26	5:48 PM	67.500	0.2/0.8	2.050	0.2000	0.410	80	1.0281	1.0000	0.9000	3.0750	2.7675	3.23	✓	
26	5:48 PM	67.500	0.2/0.8	2.050	0.8000	1.640	80	0.7719	1.0000	0.9000	3.0750	2.7675	3.23	✓	
27	5:12 PM	69.000	0.2/0.8	2.200	0.2000	0.440	80	1.0524	1.0000	0.8702	3.3000	2.8718	3.35	✓	
27	5:12 PM	69.000	0.2/0.8	2.200	0.8000	1.760	80	0.6881	1.0000	0.8702	3.3000	2.8718	3.35	✓	
28	5:27 PM	70.500	0.2/0.8	2.300	0.2000	0.460	80	1.0334	1.0000	0.8604	3.4500	2.9683	3.46	✓	
28	5:27 PM	70.500	0.2/0.8	2.300	0.8000	1.840	80	0.6873	1.0000	0.8604	3.4500	2.9683	3.46	✓	
29	5:15 PM	72.000	0.2/0.8	2.300	0.2000	0.460	80	1.0088	1.0000	0.8007	5.1750	4.1439	4.83	✓	
29	5:15 PM	72.000	0.2/0.8	2.300	0.8000	1.840	80	0.5927	1.0000	0.8007	5.1750	4.1439	4.83	✓	
30	5:18 PM	75.000	0.2/0.6/0.8	1.900	0.2000	0.380	80	0.9449	1.0000	0.7234	4.7500	3.4360	4.01	✓	
30	5:18 PM	75.000	0.2/0.6/0.8	1.900	0.6000	1.140	80	0.7393	1.0000	0.7234	4.7500	3.4360	4.01	✓	
30	5:18 PM	75.000	0.2/0.6/0.8	1.900	0.8000	1.520	80	0.4700	1.0000	0.7234	4.7500	3.4360	4.01	✓	
31	5:22 PM	77.000	0.6	1.150	0.6000	0.690	80	0.5438	1.0000	0.5438	2.0125	1.0944	1.28	✓	
32	5:25 PM	78.500	0.6	0.650	0.6000	0.390	80	0.2168	1.0000	0.2168	1.0400	0.2255	0.26	✓	
33	5:24 PM	80.200	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.2168	0.0000	0.0000	0.00	✓	

8/25/2025 9:48:38 AM

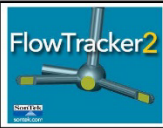
Discharge Measurement Summary

Site name	STCK04
Site number	1
Operator(s)	
File name	STCK04_20250822-180603.ft
Comment	

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	15.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings							
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
No quality control warnings							

8/25/2025 9:48:38 AM

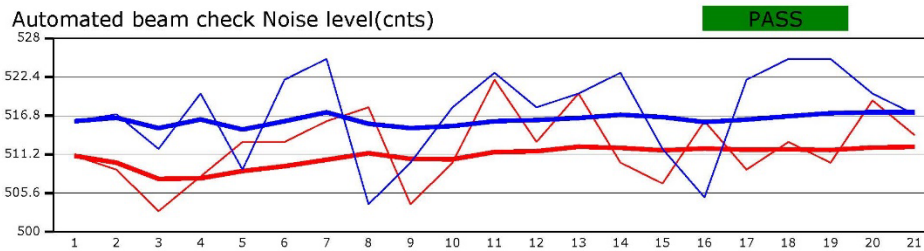
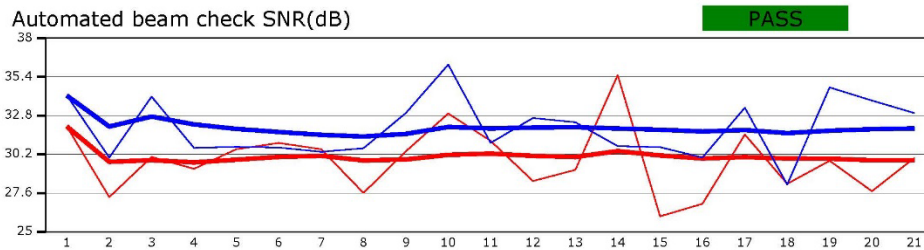


Discharge Measurement Summary

Site name STCK04
Site number 1
Operator(s)
File name STCK04_20250822-180603.ft
Comment

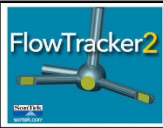
Beam 1	
Beam 2	

Automated beam check Start time 8/22/2025 4:27:06 PM



Automated beam check Quality control warnings
 No quality control warnings

8/25/2025 9:48:38 AM

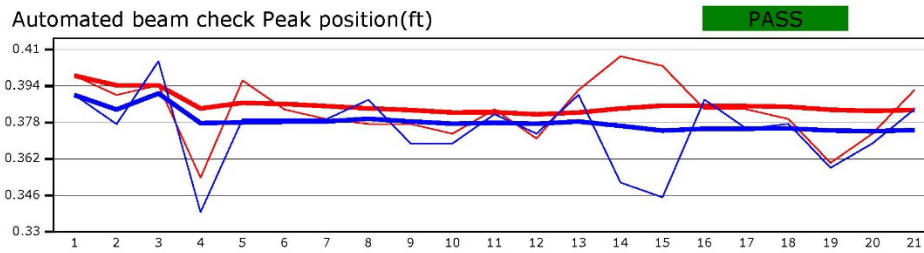
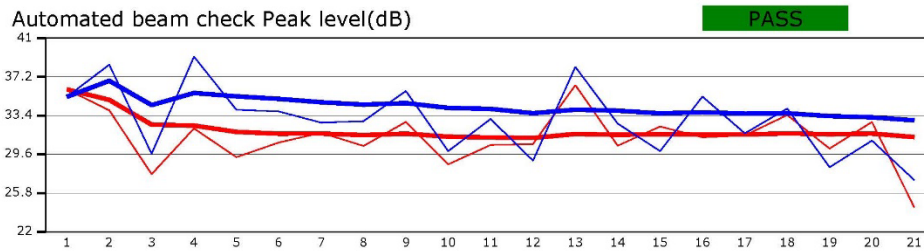


Discharge Measurement Summary

Site name STCK04
Site number 1
Operator(s)
File name STCK04_20250822-180603.ft
Comment

Beam 1	
Beam 2	

Automated beam check Start time 8/22/2025 4:27:06 PM



Automated beam check Quality control warnings
 No quality control warnings

8/25/2025 9:48:38 AM



Discharge Measurement Summary

Site name STCK04
Site number 1
Operator(s) SC
File name STCK04_20250827-152542.ft
Comment

Start time	8/27/2025 1:29 PM	Sensor type	Top Setting
End time	8/27/2025 3:21 PM	Handheld serial number	FT2H2126012
Start location latitude	39.743	Probe serial number	FT2P2127007
Start location longitude	-122.095	Probe firmware	1.30
Calculations engine	FlowTracker2	Handheld software	2.0

# Stations	Avg interval (s)	Total discharge (ft³/s)
49	40	139.7642

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
78.000	128.4250	78.555

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
38	1.646	1.0883

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
84.627	2.600	1.6001

Discharge Uncertainty		
Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.1%	0.8%
Velocity	0.2%	0.5%
Width	0.1%	0.1%
Method	0.6%	
# Stations	1.1%	
Overall	1.6%	1.3%

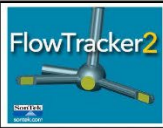
Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview

No changes were made to this file
 Quality control warnings

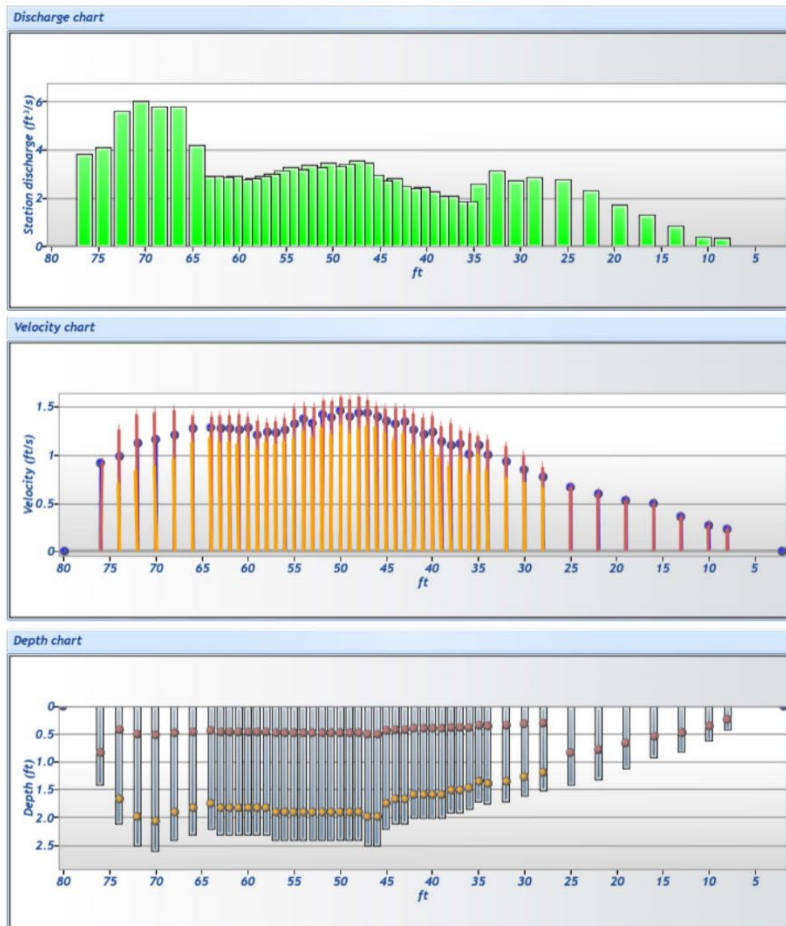
8/28/2025 9:02:34 AM



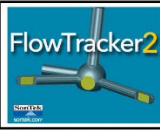
Discharge Measurement Summary

Site name STCK04
Site number 1
Operator(s) SC
File name STCK04_20250827-152542.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



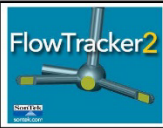
8/28/2025 9:02:34 AM



Discharge Measurement Summary

Site name STCK04
Site number 1
Operator(s) SC
File name STCK04_20250827-152542.ft
Comment

Measurement results													
Sta	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Corrected Velocity (ft/s)	Mean Velocity (ft/s)	Area (ft ²)	Flow (ft ³ /s)	WQ
0	1:29 PM	0.00	None	0.00	0.000	0.00	0	0.0000	0.0000	0.1851	0.0000	0.0000	0.00
1	1:30 PM	0.00	0.6	0.400	0.600	0.240	80	0.2324	1.0004	0.2314	1.6000	0.3702	0.26
2	1:32 PM	0.00	0.6	0.600	0.600	0.360	80	0.2662	0.0000	0.2662	1.5000	0.4037	0.29
3	1:33 PM	0.00	0.6	0.800	0.600	0.480	80	0.3576	0.0000	0.3576	2.4000	0.8582	0.61
4	1:36 PM	0.00	0.6	1.000	0.600	0.540	80	0.4026	0.0000	0.4026	2.7000	1.1327	0.95
5	1:38 PM	0.00	0.6	1.100	0.600	0.660	80	0.5276	0.0000	0.5276	3.3000	1.7412	1.25
6	1:40 PM	0.00	0.6	1.300	0.600	0.780	80	0.6005	0.0000	0.6005	3.9000	2.3421	1.68
7	1:41 PM	0.00	0.6	1.400	0.600	0.840	80	0.6669	0.0000	0.6669	4.2000	2.8010	2.00
8	1:43 PM	0.00	0.20/0.8	1.500	0.200	0.300	80	0.8685	0.0000	0.7638	3.7500	2.8641	2.05
8	1:43 PM	0.00	0.20/0.8	1.500	0.800	1.200	80	0.6590	0.0000	0.7638	3.7500	2.8641	2.05
9	1:46 PM	0.00	0.20/0.8	1.600	0.200	0.320	80	0.9891	0.0000	0.8530	3.2000	2.7297	1.95
9	1:46 PM	0.00	0.20/0.8	1.600	0.800	1.280	80	0.7169	0.0000	0.8530	3.2000	2.7297	1.95
10	1:49 PM	0.00	0.20/0.8	1.700	0.200	0.340	80	1.0670	0.0000	0.9213	3.4000	3.1391	2.25
10	1:49 PM	0.00	0.20/0.8	1.700	0.800	1.360	80	0.7595	0.0000	0.9213	3.4000	3.1391	2.25
11	1:52 PM	0.00	0.20/0.8	1.750	0.200	0.350	80	1.1250	0.0000	0.9940	3.6250	3.6092	1.87
11	1:52 PM	0.00	0.20/0.8	1.750	0.800	1.400	80	0.8330	0.0000	0.9940	3.6250	3.6092	1.87
12	1:55 PM	0.00	0.20/0.8	1.700	0.200	0.340	80	1.1524	0.0000	1.0983	3.7000	3.8671	1.34
12	1:55 PM	0.00	0.20/0.8	1.700	0.800	1.360	80	1.0042	0.0000	1.0983	3.7000	3.8671	1.34
13	1:58 PM	0.00	0.20/0.8	1.850	0.200	0.370	80	1.2726	0.0000	1.0131	3.8500	4.8743	1.34
13	1:58 PM	0.00	0.20/0.8	1.850	0.800	1.480	80	0.8036	0.0000	1.0131	3.8500	4.8743	1.34
14	2:01 PM	0.00	0.20/0.8	1.900	0.200	0.380	80	1.2506	0.0000	1.1067	3.9000	2.1027	1.50
14	2:01 PM	0.00	0.20/0.8	1.900	0.800	1.520	80	0.9627	0.0000	1.1067	3.9000	2.1027	1.50
15	2:03 PM	0.00	0.20/0.8	1.900	0.200	0.380	80	1.3206	0.0000	1.0981	3.9000	2.0864	1.40
15	2:03 PM	0.00	0.20/0.8	1.900	0.800	1.520	80	0.8756	0.0000	1.0981	3.9000	2.0864	1.40
16	2:05 PM	0.00	0.20/0.8	2.000	0.200	0.400	80	0.9774	0.0000	1.1323	4.0000	2.2666	1.62
17	2:08 PM	0.00	0.20/0.8	2.000	0.200	0.400	80	1.4000	0.0000	1.2356	4.0000	2.4711	1.77
17	2:08 PM	0.00	0.20/0.8	2.000	0.800	1.600	80	1.0711	0.0000	1.2356	4.0000	2.4711	1.77
18	2:11 PM	0.00	0.20/0.8	2.000	0.200	0.400	80	1.3068	0.0000	1.2151	4.0000	2.4302	1.74
18	2:11 PM	0.00	0.20/0.8	2.000	0.800	1.600	80	1.0969	0.0000	1.2151	4.0000	2.4302	1.74
19	2:13 PM	0.00	0.20/0.8	2.000	0.200	0.400	80	1.4263	0.0000	1.2051	4.0000	2.5303	1.81
19	2:13 PM	0.00	0.20/0.8	2.000	0.800	1.600	80	1.1940	0.0000	1.2051	4.0000	2.5303	1.81
20	2:15 PM	0.00	0.20/0.8	2.100	0.200	0.420	80	1.4671	0.0000	1.3404	4.1000	2.8149	2.01
20	2:15 PM	0.00	0.20/0.8	2.100	0.800	1.680	80	1.2138	0.0000	1.3404	4.1000	2.8149	2.01
21	2:18 PM	0.00	0.20/0.8	2.100	0.200	0.420	80	1.4797	0.0000	1.3130	4.1000	2.7572	1.97
21	2:18 PM	0.00	0.20/0.8	2.100	0.800	1.680	80	1.1462	0.0000	1.3130	4.1000	2.7572	1.97
22	2:20 PM	0.00	0.20/0.8	2.200	0.200	0.440	80	1.4777	0.0000	1.3496	4.2000	2.9691	2.12
22	2:20 PM	0.00	0.20/0.8	2.200	0.800	1.760	80	1.2214	0.0000	1.3496	4.2000	2.9691	2.12
23	2:23 PM	0.00	0.20/0.8	2.500	0.200	0.500	80	1.5031	0.0000	1.3945	4.5000	3.4862	2.49
23	2:23 PM	0.00	0.20/0.8	2.500	0.800	2.000	80	1.2898	0.0000	1.3945	4.5000	3.4862	2.49
24	2:25 PM	0.00	0.20/0.8	2.500	0.200	0.500	80	1.5637	0.0000	1.4310	4.5000	3.5775	2.56
24	2:25 PM	0.00	0.20/0.8	2.500	0.800	2.000	80	1.2983	0.0000	1.4310	4.5000	3.5775	2.56
25	2:28 PM	0.00	0.20/0.8	2.400	0.200	0.480	80	1.6003	0.0000	1.4335	4.4000	3.4404	2.46
25	2:28 PM	0.00	0.20/0.8	2.400	0.800	1.920	80	1.2670	0.0000	1.4335	4.4000	3.4404	2.46
26	2:31 PM	0.00	0.20/0.8	2.400	0.200	0.480	80	1.5070	0.0000	1.3930	4.4000	3.3432	2.39
26	2:31 PM	0.00	0.20/0.8	2.400	0.800	1.920	80	1.2125	0.0000	1.3930	4.4000	3.3432	2.39
27	2:34 PM	0.00	0.20/0.8	2.400	0.200	0.480	80	1.5664	0.0000	1.4526	4.4000	3.4863	2.49
27	2:34 PM	0.00	0.20/0.8	2.400	0.800	1.920	80	1.3008	0.0000	1.4526	4.4000	3.4863	2.49
28	2:36 PM	0.00	0.20/0.8	2.400	0.200	0.480	80	1.5530	0.0000	1.3805	4.4000	3.3132	2.37
28	2:36 PM	0.00	0.20/0.8	2.400	0.800	1.920	80	1.2080	0.0000	1.3805	4.4000	3.3132	2.37
29	2:38 PM	0.00	0.20/0.8	2.400	0.200	0.480	80	1.5588	0.0000	1.4191	4.4000	3.4057	2.44
29	2:38 PM	0.00	0.20/0.8	2.400	0.800	1.920	80	1.2750	0.0000	1.4191	4.4000	3.4057	2.44
30	2:40 PM	0.00	0.20/0.8	2.400	0.200	0.480	80	1.4866	0.0000	1.3304	4.4000	3.1929	2.28
30	2:40 PM	0.00	0.20/0.8	2.400	0.800	1.920	80	1.1741	0.0000	1.3304	4.4000	3.1929	2.28
31	2:42 PM	0.00	0.20/0.8	2.400	0.200	0.480	80	1.5075	0.0000	1.3716	4.4000	3.2919	2.36
31	2:42 PM	0.00	0.20/0.8	2.400	0.800	1.920	80	1.2407	0.0000	1.3716	4.4000	3.2919	2.36
32	2:44 PM	0.00	0.20/0.8	2.400	0.200	0.480	80	1.4777	0.0000	1.3195	4.4000	3.1668	2.27
32	2:44 PM	0.00	0.20/0.8	2.400	0.800	1.920	80	1.1612	0.0000	1.3195	4.4000	3.1668	2.27
33	2:47 PM	0.00	0.20/0.8	2.400	0.200	0.480	80	1.3749	0.0000	1.2580	4.4000	2.9392	2.16
33	2:47 PM	0.00	0.20/0.8	2.400	0.800	1.920	80	1.1411	0.0000	1.2580	4.4000	2.9392	2.16
34	2:49 PM	0.00	0.20/0.8	2.400	0.200	0.480	80	1.3437	0.0000	1.2260	4.4000	2.9425	2.11
34	2:49 PM	0.00	0.20/0.8	2.400	0.800	1.920	80	1.1084	0.0000	1.2260	4.4000	2.9425	2.11
35	2:51 PM	0.00	0.20/0.8	2.300	0.200	0.460	80	1.3267	0.0000	1.2320	4.3000	2.8337	2.03
35	2:51 PM	0.00	0.20/0.8	2.300	0.800	1.840	80	1.1364	0.0000	1.2320	4.3000	2.8337	2.03
36	2:53 PM	0.00	0.20/0.8	2.300	0.200	0.460	80	1.3483	0.0000	1.2025	4.3000	2.7680	1.98
36	2:53 PM	0.00	0.20/0.8	2.300	0.800	1.840	80	1.0987	0.0000	1.2025	4.3000	2.7680	1.98
37	2:56 PM	0.00	0.20/0.8	2.300	0.200	0.460	80	1.3887	0.0000	1.2812	4.3000	2.9466	2.11
37	2:56 PM	0.00	0.20/0.8	2.300	0.800	1.840	80	1.1736	0.0000	1.2812	4.3000	2.9466	2.11
38	2:58 PM	0.00	0.20/0.8	2.300	0.200	0.460	80	1.4150	0.0000	1.2620	4.3000	2.9026	2.08
38	2:58 PM	0.00	0.20/0.8	2.300	0.800	1.840	80	1.1590	0.0000	1.2620	4.3000	2.9026	2.08
39	3:00 PM	0.00	0.20/0.8	2.300	0.200	0.460	80	1.4048	0.0000	1.2702	4.3000	2.9015	2.09
39	3:00 PM	0.00	0.20/0.8	2.300	0.800	1.840	80	1.1756	0.0000	1.2702	4.3000	2.9015	2.09
40	3:03 PM	0.00	0.20/0.8	2.300	0.200	0.460	80	1.4028	0.0000	1.2663	4.3000	2.9124	2.08
40	3:03 PM	0.00	0.20/0.8	2.300	0.800	1.840	80	1.1297	0.0000	1.2663	4.3000	2.9124	2.08
41	3:05 PM	0.00	0.20/0.8	2.200	0.200	0.440	80	1.3925	0.0000	1.2010	4.2000	2.7272	1.92
41	3:05 PM	0.00	0.20/0.8	2.200	0.800	1.760	80	1.1695	0.0000	1.2010	4.2000	2.7272	1.92
42	3:07 PM	0.00	0.20/0.8	2.300	0.200	0.460	80	1.4053	0.0000	1.2662	4.6000	3.8245	4.17
42	3:07 PM	0.00	0.20/0.8	2.300	0.800	1.840	80	1.1772	0.0000	1.2662	4.6000	3.8245	4.17
43	3:09 PM	0.00	0.20/0.8	2.400	0.200	0.480	80	1.4590	0.0000	1.2088	4.8000	3.8023	4.15
43	3:09 PM	0.00	0.20/0.8	2.400	0.800	1.920	80	0.9577	0.0000	1.2088	4.8000	3.8023	4.15
44	3:12 PM	0.00	0.20/0.8	2.600	0.200	0.520	80	1.5198	0.0000	1.3488	4.8000	4.2602	2.48
44	3:12 PM	0.00	0.20/0.8	2.600	0.800	2.080	80	0.8809	0.0000	1.3488	4.8000	4.2602	2.48
45	3:14 PM	0.00	0.20/0.8	2.700	0.200	0.540	80	1.4139	0.0000	1.3145	5.0000	2.626	2.42
45	3:14 PM	0.00	0.20/0.8	2.700	0.800	2.160	80	1.0751					



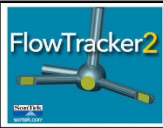
Discharge Measurement Summary

Site name STCK04
Site number 1
Operator(s) SC
File name STCK04_20250827-152542.ft
Comment

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	20.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings							
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
48	3:21 PM	80.000	None	0.000	0.0000	0.000	Water Depth > QC

8/28/2025 9:02:34 AM

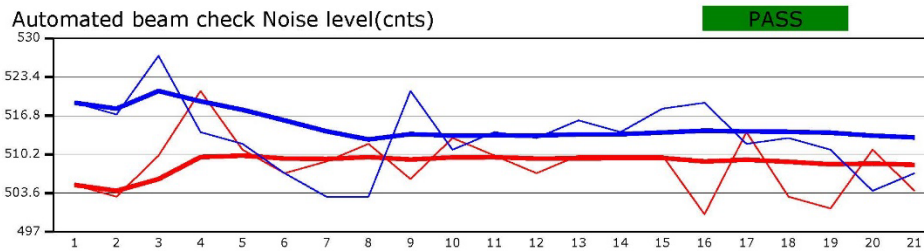
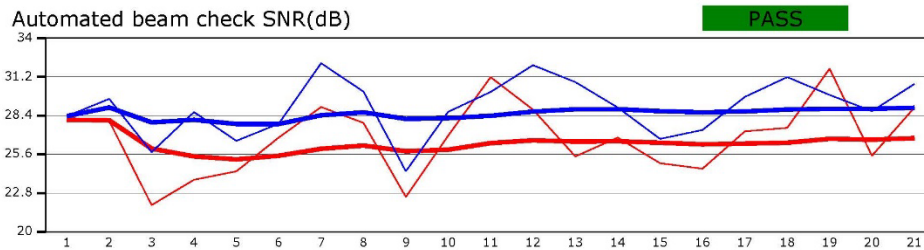


Discharge Measurement Summary

Site name STCK04
Site number 1
Operator(s) SC
File name STCK04_20250827-152542.ft
Comment

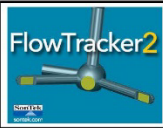
Beam 1	
Beam 2	

Automated beam check Start time 8/27/2025 1:29:35 PM



Automated beam check Quality control warnings
 No quality control warnings

8/28/2025 9:02:34 AM

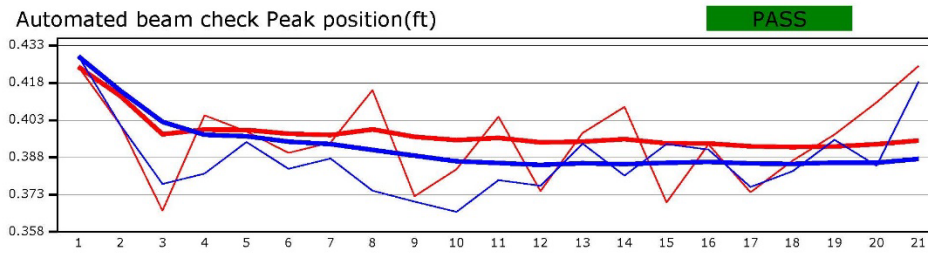
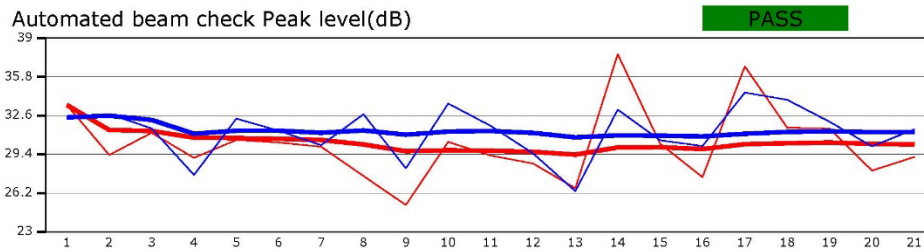


Discharge Measurement Summary

Site name STCK04
Site number 1
Operator(s) SC
File name STCK04_20250827-152542.ft
Comment

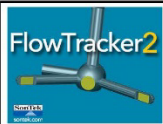
Beam 1	
Beam 2	

Automated beam check Start time 8/27/2025 1:29:35 PM



Automated beam check Quality control warnings
 No quality control warnings

8/28/2025 9:02:34 AM



Discharge Measurement Summary

Site name STCK04
Site number 1
Operator(s) DM
File name STCK04_20250912-151743.ft
Comment

Start time	9/12/2025 2:09 PM	Sensor type	Top Setting
End time	9/12/2025 3:14 PM	Handheld serial number	FT2H2126012
Start location latitude	39.743	Probe serial number	FT2P2127007
Start location longitude	-122.095	Probe firmware	1.30
Calculations engine	FlowTracker2	Handheld software	2.0

# Stations	Avg interval (s)	Total discharge (ft³/s)
28	40	111.2780

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
77.800	120.3650	78.186

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
35	1.547	0.9245

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
82.176	2.350	1.3554

Discharge Uncertainty		
Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.1%	1.1%
Velocity	0.2%	1.3%
Width	0.1%	0.1%
Method	0.9%	
# Stations	1.8%	
Overall	2.3%	2.0%

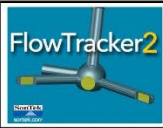
Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview

No changes were made to this file
 Quality control warnings

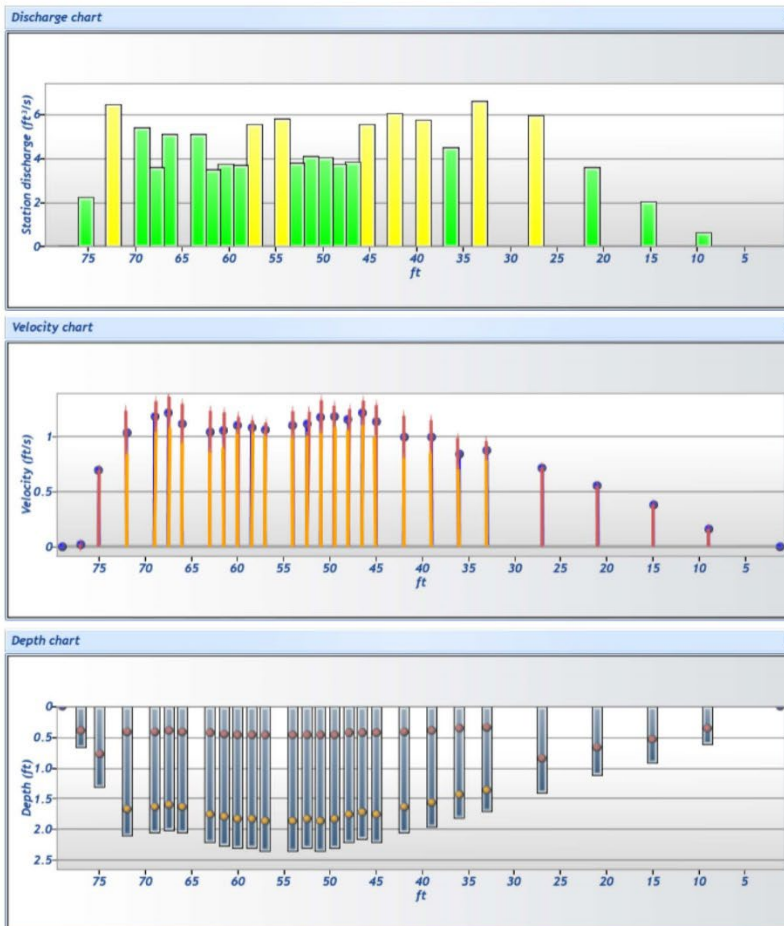
9/15/2025 8:44:35 AM



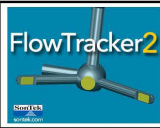
Discharge Measurement Summary

Site name STCK04
Site number 1
Operator(s) DM
File name STCK04_20250912-151743.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



9/15/2025 8:44:35 AM

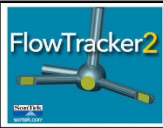


Discharge Measurement Summary

Site name STCK04
Site number 1
Operator(s) DM
File name STCK04_20250912-151743.ft
Comment

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft ²)	Flow (ft ³ /s)	%Q
0	2:09 PM	1.200	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.1588	0.0000	0.0000	0.00
1	2:10 PM	9.000	0.6	0.600	0.6000	0.360	80	0.1588	1.0000	0.1588	4.1400	0.6573	0.59
2	2:12 PM	15.000	0.6	0.900	0.6000	0.540	80	0.3799	1.0000	0.3799	5.4000	2.0516	1.84
3	2:13 PM	21.000	0.6	1.100	0.6000	0.660	80	0.5477	1.0000	0.5477	6.6000	3.6150	3.25
4	2:15 PM	27.000	0.6	1.400	0.6000	0.840	80	0.7138	1.0000	0.7138	8.4000	5.9958	5.39
5	2:16 PM	33.000	0.2/0.8	1.700	0.2000	0.340	80	0.9526	1.0000	0.8662	7.6500	6.6263	5.95
5	2:16 PM	33.000	0.2/0.8	1.700	0.8000	1.360	80	0.7798	1.0000	0.8662	7.6500	6.6263	5.95
6	2:56 PM	36.000	0.2/0.8	1.800	0.2000	0.360	80	0.9821	1.0000	0.8396	5.4000	4.5337	4.07
6	2:56 PM	36.000	0.2/0.8	1.800	0.8000	1.440	80	0.6971	1.0000	0.8396	5.4000	4.5337	4.07
7	2:19 PM	39.000	0.2/0.8	1.950	0.2000	0.390	80	1.1410	1.0000	0.9926	5.8500	5.8070	5.22
7	2:19 PM	39.000	0.2/0.8	1.950	0.8000	1.560	80	0.8443	1.0000	0.9926	5.8500	5.8070	5.22
8	2:53 PM	42.000	0.2/0.8	2.050	0.2000	0.410	80	1.1816	1.0000	0.9903	6.1500	6.0901	5.47
8	2:53 PM	42.000	0.2/0.8	2.050	0.8000	1.640	80	0.7990	1.0000	0.9903	6.1500	6.0901	5.47
9	2:21 PM	45.000	0.2/0.8	2.200	0.2000	0.440	80	1.2781	1.0000	1.1330	4.9500	5.6083	5.04
9	2:21 PM	45.000	0.2/0.8	2.200	0.8000	1.760	80	0.9879	1.0000	1.1330	4.9500	5.6083	5.04
10	2:59 PM	46.500	0.2/0.8	2.150	0.2000	0.430	80	1.3180	1.0000	1.2074	3.2250	3.8940	3.50
10	2:59 PM	46.500	0.2/0.8	2.150	0.8000	1.720	80	1.0968	1.0000	1.2074	3.2250	3.8940	3.50
11	2:50 PM	48.000	0.2/0.8	2.200	0.2000	0.440	80	1.2415	1.0000	1.1465	3.3000	3.7835	3.40
11	2:50 PM	48.000	0.2/0.8	2.200	0.8000	1.760	80	1.0516	1.0000	1.1465	3.3000	3.7835	3.40
12	3:02 PM	49.500	0.2/0.8	2.300	0.2000	0.460	80	1.2728	1.0000	1.1766	3.4500	4.0594	3.65
12	3:02 PM	49.500	0.2/0.8	2.300	0.8000	1.840	80	1.0805	1.0000	1.1766	3.4500	4.0594	3.65
13	2:24 PM	51.000	0.2/0.8	2.350	0.2000	0.470	80	1.3213	1.0000	1.1728	3.5250	4.1341	3.72
13	2:24 PM	51.000	0.2/0.8	2.350	0.8000	1.880	80	1.0243	1.0000	1.1728	3.5250	4.1341	3.72
14	3:05 PM	52.500	0.2/0.8	2.300	0.2000	0.460	80	1.2189	1.0000	1.1078	3.4500	3.8220	3.43
14	3:05 PM	52.500	0.2/0.8	2.300	0.8000	1.840	80	0.9968	1.0000	1.1078	3.4500	3.8220	3.43
15	2:47 PM	54.000	0.2/0.8	2.350	0.2000	0.470	80	1.2230	1.0000	1.1023	5.2875	5.8284	5.24
15	2:47 PM	54.000	0.2/0.8	2.350	0.8000	1.880	80	0.9816	1.0000	1.1023	5.2875	5.8284	5.24
16	2:27 PM	57.000	0.2/0.8	2.350	0.2000	0.470	80	1.1210	1.0000	1.0574	5.2875	5.5911	5.02
16	2:27 PM	57.000	0.2/0.8	2.350	0.8000	1.880	80	0.9939	1.0000	1.0574	5.2875	5.5911	5.02
17	3:07 PM	58.500	0.2/0.8	2.300	0.2000	0.460	80	1.1400	1.0000	1.0805	3.4500	3.7278	3.35
17	3:07 PM	58.500	0.2/0.8	2.300	0.8000	1.840	80	1.0210	1.0000	1.0805	3.4500	3.7278	3.35
18	2:45 PM	60.000	0.2/0.8	2.300	0.2000	0.460	80	1.1728	1.0000	1.0962	3.4500	3.7818	3.40
18	2:45 PM	60.000	0.2/0.8	2.300	0.8000	1.840	80	1.0195	1.0000	1.0962	3.4500	3.7818	3.40
19	3:11 PM	61.500	0.2/0.8	2.250	0.2000	0.450	80	1.2134	1.0000	1.0503	3.3750	3.5446	3.19
19	3:11 PM	61.500	0.2/0.8	2.250	0.8000	1.800	80	0.8871	1.0000	1.0503	3.3750	3.5446	3.19
20	2:30 PM	63.000	0.2/0.8	2.200	0.2000	0.440	80	1.2264	1.0000	1.0388	4.9500	5.1423	4.62
20	2:30 PM	63.000	0.2/0.8	2.200	0.8000	1.760	80	0.8513	1.0000	1.0388	4.9500	5.1423	4.62
21	2:42 PM	66.000	0.2/0.8	2.050	0.2000	0.410	80	1.2908	1.0000	1.1130	4.6125	5.1337	4.61
21	2:42 PM	66.000	0.2/0.8	2.050	0.8000	1.640	80	0.9351	1.0000	1.1130	4.6125	5.1337	4.61
22	3:14 PM	67.500	0.2/0.8	2.000	0.2000	0.400	80	1.3554	1.0000	1.2138	3.0000	3.6415	3.27
22	3:14 PM	67.500	0.2/0.8	2.000	0.8000	1.600	80	1.0723	1.0000	1.2138	3.0000	3.6415	3.27
23	2:32 PM	69.000	0.2/0.8	2.050	0.2000	0.410	80	1.3136	1.0000	1.1761	4.6125	5.4248	4.87
23	2:32 PM	69.000	0.2/0.8	2.050	0.8000	1.640	80	1.0386	1.0000	1.1761	4.6125	5.4248	4.87
24	2:38 PM	72.000	0.2/0.8	2.100	0.2000	0.420	80	1.2282	1.0000	1.0312	6.3000	6.4963	5.84
24	2:38 PM	72.000	0.2/0.8	2.100	0.8000	1.680	80	0.8341	1.0000	1.0312	6.3000	6.4963	5.84
25	2:35 PM	75.000	0.6	1.300	0.6000	0.780	80	0.6954	1.0000	0.6954	3.2500	2.2601	2.03
26	2:37 PM	77.000	0.6	0.650	0.6000	0.390	80	0.0211	1.0000	0.0211	1.3000	0.0274	0.02
27	2:38 PM	79.000	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.0211	0.0000	0.0000	0.00

9/15/2025 8:44:35 AM



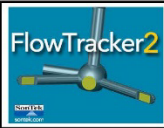
Discharge Measurement Summary

Site name STCK04
Site number 1
Operator(s) DM
File name STCK04_20250912-151743.ft
Comment

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	15.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings							
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
26	2:37 PM	77.000	0.6	0.650	0.6000	0.390	Boundary Interference

9/15/2025 8:44:35 AM

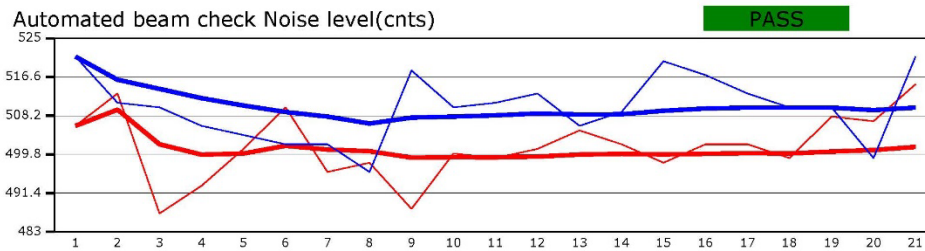
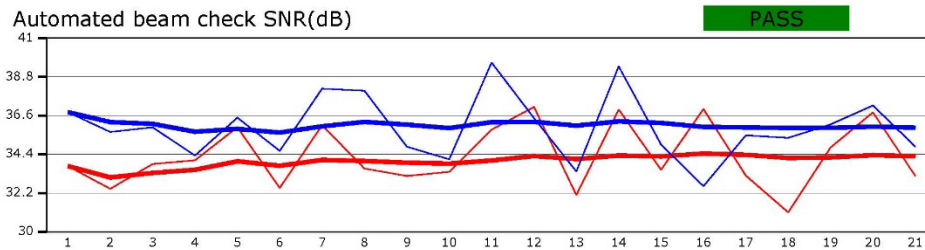


Discharge Measurement Summary

Site name STCK04
Site number 1
Operator(s) DM
File name STCK04_20250912-151743.ft
Comment

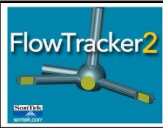
Beam 1	
Beam 2	

Automated beam check Start time 9/12/2025 2:08:38 PM



Automated beam check Quality control warnings
 No quality control warnings

9/15/2025 8:44:35 AM

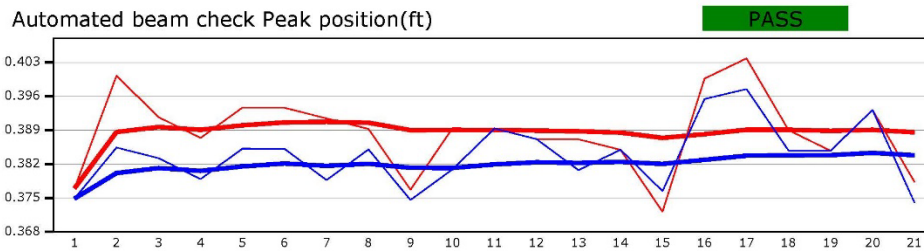
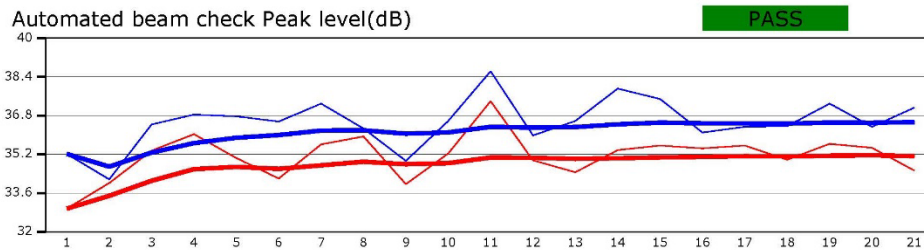


Discharge Measurement Summary

Site name STCK04
Site number 1
Operator(s) DM
File name STCK04_20250912-151743.ft
Comment

Beam 1	
Beam 2	

Automated beam check Start time 9/12/2025 2:08:38 PM



Automated beam check Quality control warnings
 No quality control warnings

9/15/2025 8:44:35 AM

6.1.1.5 STCK05

Discharge Measurement Summary

Site name	STCK05
Site number	1
Operator(s)	
File name	STCK05_20250822-194616.ft
Comment	

Start time	8/22/2025 6:47 PM	Sensor type	Top Setting
End time	8/22/2025 7:37 PM	Handheld serial number	FT2H2126012
Start location latitude	39.711	Probe serial number	FT2P2127007
Start location longitude	-122.009	Probe firmware	1.30
Calculations engine	FlowTracker2	Handheld software	2.0

# Stations	Avg interval (s)	Total discharge (ft³/s)
31	40	52.7594

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
78.300	47.4388	78.385

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
26	0.606	1.1122

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
87.240	0.900	1.5118

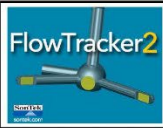
Discharge Uncertainty		
Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.3%	3.0%
Velocity	0.3%	1.1%
Width	0.1%	0.1%
Method	1.5%	
# Stations	1.7%	
Overall	2.5%	3.3%

Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview
No changes were made to this file
Quality control warnings

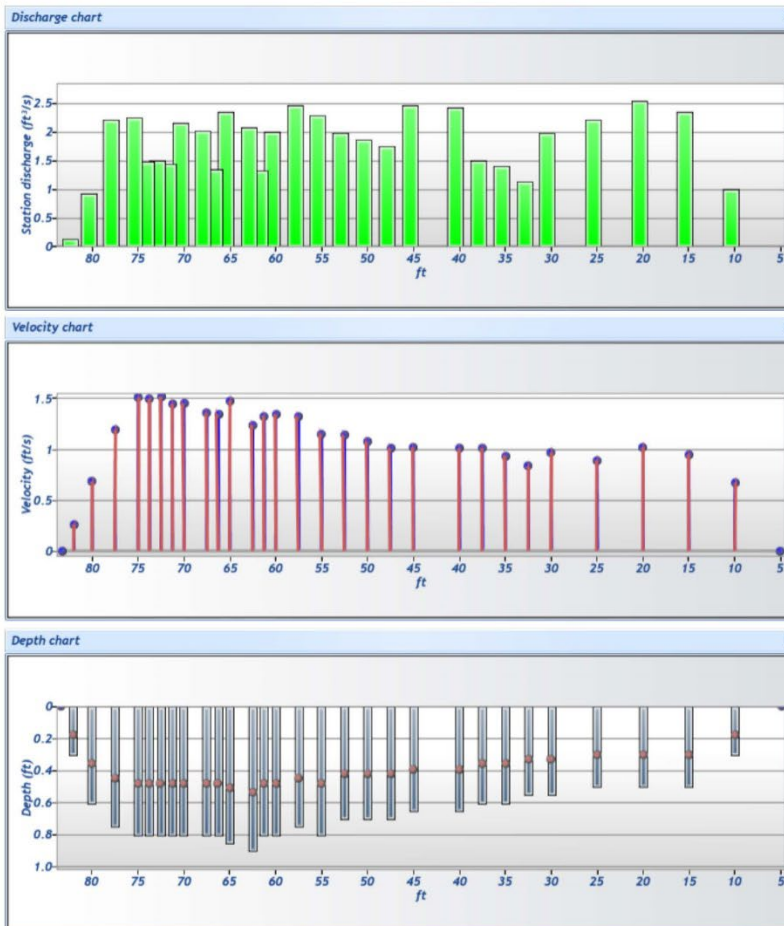
8/25/2025 9:49:38 AM



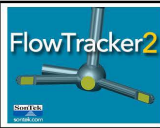
Discharge Measurement Summary

Site name STCK05
Site number 1
Operator(s)
File name STCK05_20250822-194616.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



8/25/2025 9:49:38 AM

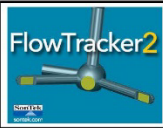


Discharge Measurement Summary

Site name STCK05
Site number 1
Operator(s)
File name STCK05_20250822-194616.ft
Comment

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft ²)	Flow (ft ³ /s)	%Q	
0	6:47 PM	5.000	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.6698	0.0000	0.0000	0.00	✓
1	6:48 PM	10.000	0.6	0.300	0.6000	0.180	80	0.6698	1.0000	0.6698	1.5000	1.0047	1.90	✓
2	6:50 PM	15.000	0.6	0.500	0.6000	0.300	80	0.9452	1.0000	0.9452	2.5000	2.3629	4.48	✓
3	6:52 PM	20.000	0.6	0.500	0.6000	0.300	80	1.0170	1.0000	1.0170	2.5000	2.5425	4.82	✓
4	6:53 PM	25.000	0.6	0.500	0.6000	0.300	80	0.8912	1.0000	0.8912	2.5000	2.2281	4.22	✓
5	6:54 PM	30.000	0.6	0.550	0.6000	0.330	80	0.9650	1.0000	0.9650	2.0625	1.9904	3.77	✓
6	7:27 PM	32.500	0.6	0.550	0.6000	0.330	80	0.8301	1.0000	0.8301	1.3750	1.1414	2.16	✓
7	6:57 PM	35.000	0.6	0.600	0.6000	0.360	80	0.9338	1.0000	0.9338	1.5000	1.4006	2.65	✓
8	7:25 PM	37.500	0.6	0.600	0.6000	0.360	80	1.0050	1.0000	1.0050	1.5000	1.5074	2.86	✓
9	6:58 PM	40.000	0.6	0.650	0.6000	0.390	80	1.0021	1.0000	1.0021	2.4375	2.4425	4.63	✓
10	7:00 PM	45.000	0.6	0.650	0.6000	0.390	80	1.0127	1.0000	1.0127	2.4375	2.4684	4.68	✓
11	7:23 PM	47.500	0.6	0.700	0.6000	0.420	80	1.0070	1.0000	1.0070	1.7500	1.7623	3.34	✓
12	7:01 PM	50.000	0.6	0.700	0.6000	0.420	80	1.0731	1.0000	1.0731	1.7500	1.8779	3.56	✓
13	7:20 PM	52.500	0.6	0.700	0.6000	0.420	80	1.1318	1.0000	1.1318	1.7500	1.9807	3.75	✓
14	7:03 PM	55.000	0.6	0.800	0.6000	0.480	80	1.1482	1.0000	1.1482	2.0000	2.2964	4.35	✓
15	7:18 PM	57.500	0.6	0.750	0.6000	0.450	80	1.3191	1.0000	1.3191	1.8750	2.4733	4.69	✓
16	7:04 PM	60.000	0.6	0.800	0.6000	0.480	80	1.3374	1.0000	1.3374	1.5000	2.0061	3.80	✓
17	7:33 PM	61.250	0.6	0.800	0.6000	0.480	80	1.3230	1.0000	1.3230	1.0000	1.3230	2.51	✓
18	7:17 PM	62.500	0.6	0.900	0.6000	0.540	80	1.2361	1.0000	1.2361	1.6875	2.0860	3.95	✓
19	7:05 PM	65.000	0.6	0.850	0.6000	0.510	80	1.4727	1.0000	1.4727	1.5938	2.3471	4.45	✓
20	7:31 PM	66.250	0.6	0.800	0.6000	0.480	80	1.3430	1.0000	1.3430	1.0000	1.3430	2.55	✓
21	7:15 PM	67.500	0.6	0.800	0.6000	0.480	80	1.3494	1.0000	1.3494	1.5000	2.0241	3.84	✓
22	7:07 PM	70.000	0.6	0.800	0.6000	0.480	80	1.4468	1.0000	1.4468	1.5000	2.1702	4.11	✓
23	7:35 PM	71.250	0.6	0.800	0.6000	0.480	80	1.4439	1.0000	1.4439	1.0000	1.4439	2.74	✓
24	7:14 PM	72.500	0.6	0.800	0.6000	0.480	80	1.5118	1.0000	1.5118	1.0000	1.5118	2.87	✓
25	7:37 PM	73.750	0.6	0.800	0.6000	0.480	80	1.4893	1.0000	1.4893	1.0000	1.4893	2.82	✓
26	7:08 PM	75.000	0.6	0.800	0.6000	0.480	80	1.5037	1.0000	1.5037	1.5000	2.2556	4.28	✓
27	7:29 PM	77.500	0.6	0.750	0.6000	0.450	80	1.1898	1.0000	1.1898	1.8750	2.2308	4.23	✓
28	7:09 PM	80.000	0.6	0.600	0.6000	0.360	80	0.6809	1.0000	0.6809	1.3500	0.9192	1.74	✓
29	7:11 PM	82.000	0.6	0.300	0.6000	0.180	80	0.2620	1.0000	0.2620	0.4950	0.1297	0.25	✓
30	7:13 PM	83.300	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.2620	0.0000	0.0000	0.00	✓

8/25/2025 9:49:38 AM



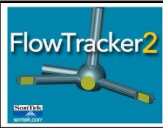
Discharge Measurement Summary

Site name STCK05
Site number 1
Operator(s)
File name STCK05_20250822-194616.ft
Comment

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	15.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings							
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	6:48 PM	10.000	0.6	0.300	0.6000	0.180	SNR Threshold Variation
29	7:11 PM	82.000	0.6	0.300	0.6000	0.180	Boundary Interference, Standard Error > QC

8/25/2025 9:49:38 AM

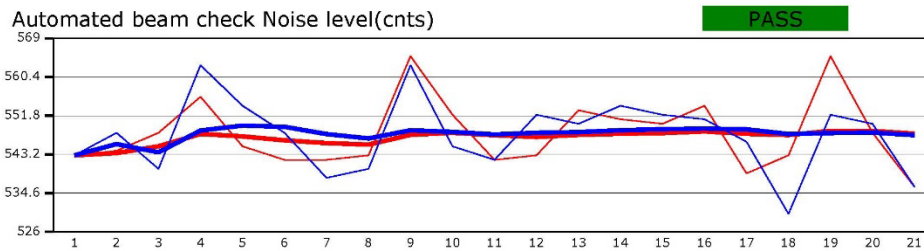
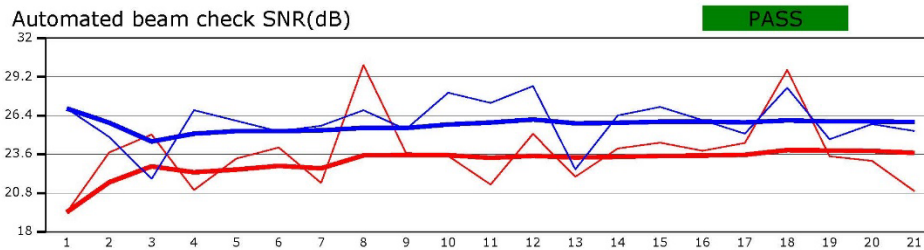


Discharge Measurement Summary

Site name STCK05
Site number 1
Operator(s)
File name STCK05_20250822-194616.ft
Comment

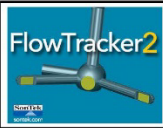
Beam 1	
Beam 2	

Automated beam check Start time 8/22/2025 6:47:10 PM



Automated beam check Quality control warnings
 No quality control warnings

8/25/2025 9:49:38 AM

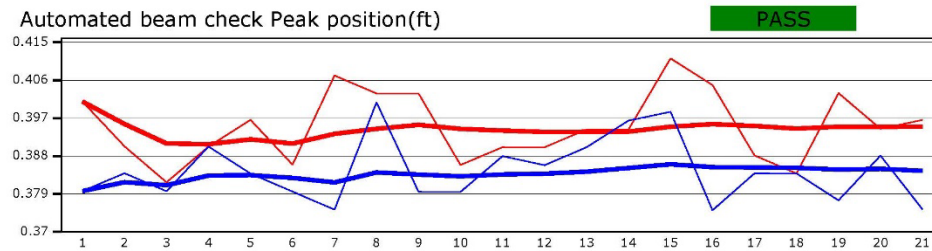
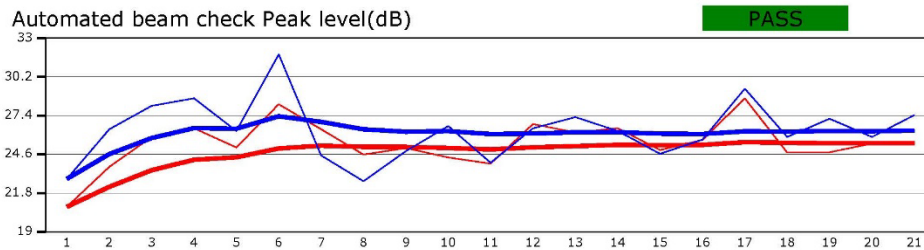


Discharge Measurement Summary

Site name STCK05
Site number 1
Operator(s)
File name STCK05_20250822-194616.ft
Comment

Beam 1	
Beam 2	

Automated beam check Start time 8/22/2025 6:47:10 PM



Automated beam check Quality control warnings
 No quality control warnings

8/25/2025 9:49:38 AM



Discharge Measurement Summary

Site name STCK05
Site number 1
Operator(s)
File name STCK05_20250827-183849.ft
Comment

Start time	8/27/2025 5:40 PM	Sensor type	Top Setting
End time	8/27/2025 6:26 PM	Handheld serial number	FT2H2126012
Start location latitude	39.711	Probe serial number	FT2P2127007
Start location longitude	-122.009	Probe firmware	1.30
Calculations engine	FlowTracker2	Handheld software	2.0

# Stations	Avg interval (s)	Total discharge (ft³/s)
33	40	86.6526

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
80.500	63.9250	80.636

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
31	0.794	1.3555

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
85.287	1.100	1.7517

Discharge Uncertainty		
Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.2%	2.1%
Velocity	0.3%	0.6%
Width	0.1%	0.1%
Method	1.4%	
# Stations	1.6%	
Overall	2.3%	2.4%

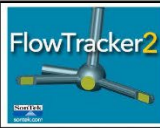
Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview

No changes were made to this file
 Quality control warnings

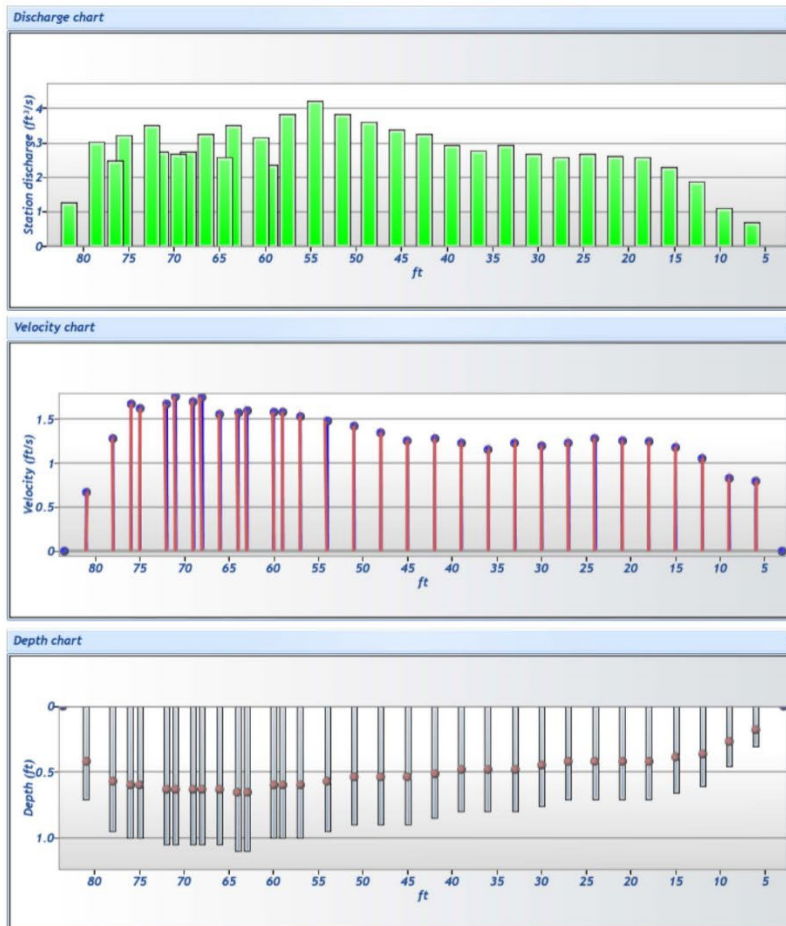
8/28/2025 8:58:12 AM



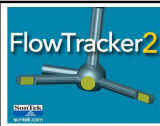
Discharge Measurement Summary

Site name STCK05
Site number 1
Operator(s)
File name STCK05_20250827-183849.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



8/28/2025 8:58:12 AM

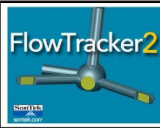


Discharge Measurement Summary

Site name STCK05
Site number 1
Operator(s)
File name STCK05_20250827-183849.ft
Comment

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft ²)	Flow (ft ³ /s)	%Q	
0	5:40 PM	3.000	None	0.000	0.0000	0.000	0	0.0000	0.8000	0.6368	0.0000	0.0000	0.00	✓
1	5:41 PM	6.000	0.6	0.300	0.6000	0.180	80	0.7960	1.0000	0.7960	0.9000	0.7164	0.83	✓
2	5:43 PM	9.000	0.6	0.450	0.6000	0.270	80	0.8238	1.0000	0.8238	1.3500	1.1121	1.28	✓
3	5:44 PM	12.000	0.6	0.600	0.6000	0.360	80	1.0492	1.0000	1.0492	1.8000	1.8886	2.18	✓
4	5:45 PM	15.000	0.6	0.650	0.6000	0.390	80	1.1831	1.0000	1.1831	1.9500	2.3070	2.66	✓
5	5:47 PM	18.000	0.6	0.700	0.6000	0.420	80	1.2400	1.0000	1.2400	2.1000	2.6041	3.01	✓
6	5:48 PM	21.000	0.6	0.700	0.6000	0.420	80	1.2493	1.0000	1.2493	2.1000	2.6236	3.03	✓
7	5:50 PM	24.000	0.6	0.700	0.6000	0.420	80	1.2791	1.0000	1.2791	2.1000	2.6860	3.10	✓
8	5:52 PM	27.000	0.6	0.700	0.6000	0.420	80	1.2348	1.0000	1.2348	2.1000	2.5931	2.99	✓
9	5:53 PM	30.000	0.6	0.750	0.6000	0.450	80	1.1966	1.0000	1.1966	2.2500	2.6923	3.11	✓
10	5:56 PM	33.000	0.6	0.800	0.6000	0.480	80	1.2278	1.0000	1.2278	2.4000	2.9468	3.40	✓
11	5:57 PM	36.000	0.6	0.800	0.6000	0.480	80	1.1532	1.0000	1.1532	2.4000	2.7676	3.19	✓
12	5:58 PM	39.000	0.6	0.800	0.6000	0.480	80	1.2271	1.0000	1.2271	2.4000	2.9450	3.40	✓
13	6:00 PM	42.000	0.6	0.850	0.6000	0.510	80	1.2742	1.0000	1.2742	2.5500	3.2492	3.75	✓
14	6:01 PM	45.000	0.6	0.900	0.6000	0.540	80	1.2535	1.0000	1.2535	2.7000	3.3844	3.91	✓
15	6:02 PM	48.000	0.6	0.900	0.6000	0.540	80	1.3400	1.0000	1.3400	2.7000	3.6179	4.18	✓
16	6:04 PM	51.000	0.6	0.900	0.6000	0.540	80	1.4208	1.0000	1.4208	2.7000	3.8361	4.43	✓
17	6:05 PM	54.000	0.6	0.950	0.6000	0.570	80	1.4767	1.0000	1.4767	2.8500	4.2085	4.86	✓
18	6:06 PM	57.000	0.6	1.000	0.6000	0.600	80	1.5343	1.0000	1.5343	2.5000	3.8357	4.43	✓
19	6:24 PM	59.000	0.6	1.000	0.6000	0.600	80	1.5786	1.0000	1.5786	1.5000	2.3680	2.73	✓
20	6:07 PM	60.000	0.6	1.000	0.6000	0.600	80	1.5763	1.0000	1.5763	2.0000	3.1527	3.64	✓
21	6:09 PM	63.000	0.6	1.100	0.6000	0.660	80	1.5915	1.0000	1.5915	2.2000	3.5013	4.04	✓
22	6:20 PM	64.000	0.6	1.100	0.6000	0.660	80	1.5654	1.0000	1.5654	1.6500	2.5830	2.98	✓
23	6:10 PM	66.000	0.6	1.050	0.6000	0.630	80	1.5557	1.0000	1.5557	2.1000	3.2669	3.77	✓
24	6:22 PM	68.000	0.6	1.050	0.6000	0.630	80	1.7408	1.0000	1.7408	1.5750	2.7418	3.16	✓
25	6:11 PM	69.000	0.6	1.050	0.6000	0.630	80	1.6988	1.0000	1.6988	1.5750	2.6757	3.09	✓
26	6:19 PM	71.000	0.6	1.050	0.6000	0.630	80	1.7517	1.0000	1.7517	1.5750	2.7590	3.18	✓
27	6:12 PM	72.000	0.6	1.050	0.6000	0.630	80	1.6714	1.0000	1.6714	2.1000	3.5099	4.05	✓
28	6:13 PM	75.000	0.6	1.000	0.6000	0.600	80	1.6187	1.0000	1.6187	2.0000	3.2375	3.74	✓
29	6:26 PM	76.000	0.6	1.000	0.6000	0.600	80	1.6728	1.0000	1.6728	1.5000	2.5091	2.90	✓
30	6:14 PM	78.000	0.6	0.950	0.6000	0.570	80	1.2832	1.0000	1.2832	2.3750	3.0476	3.52	✓
31	6:16 PM	81.000	0.6	0.700	0.6000	0.420	80	0.6679	1.0000	0.6679	1.9250	1.2857	1.48	✓
32	6:17 PM	83.500	None	0.000	0.0000	0.000	0	0.0000	0.8000	0.5343	0.0000	0.0000	0.00	✓

8/28/2025 8:58:12 AM



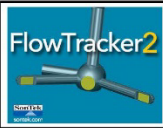
Discharge Measurement Summary

Site name STCK05
Site number 1
Operator(s)
File name STCK05_20250827-183849.ft
Comment

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	15.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings							
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
23	6:10 PM	66.000	0.6	1.050	0.6000	0.630	Stn Spacing > QC
30	6:14 PM	78.000	0.6	0.950	0.6000	0.570	Stn Spacing > QC
32	6:17 PM	83.500	None	0.000	0.0000	0.000	Water Depth > QC

8/28/2025 8:58:12 AM

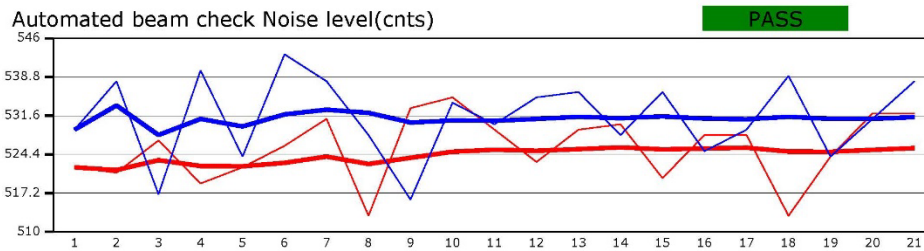
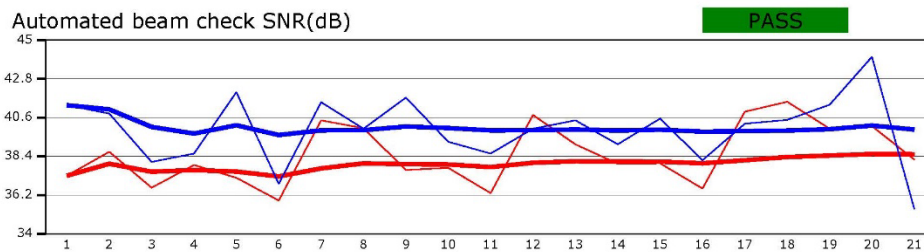


Discharge Measurement Summary

Site name STCK05
Site number 1
Operator(s)
File name STCK05_20250827-183849.ft
Comment

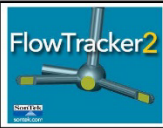
Beam 1	
Beam 2	

Automated beam check Start time 8/27/2025 5:40:32 PM



Automated beam check Quality control warnings
 No quality control warnings

8/28/2025 8:58:12 AM

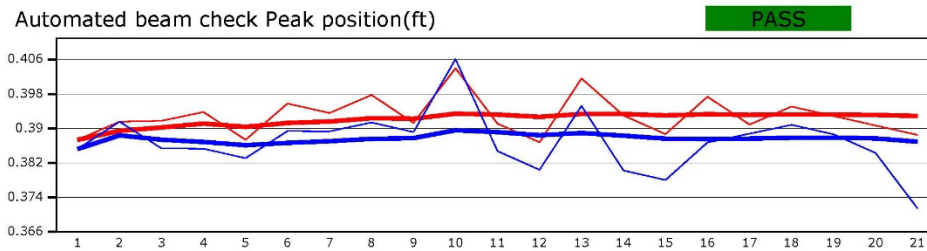
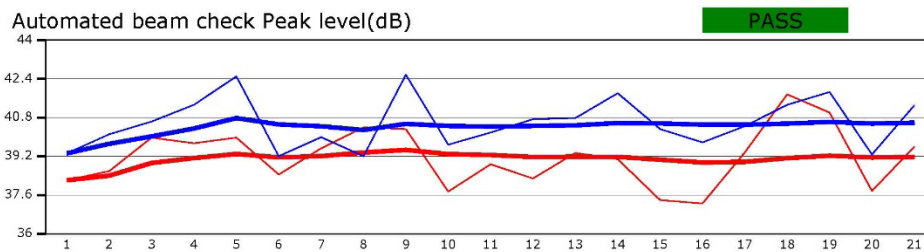


Discharge Measurement Summary

Site name STCK05
Site number 1
Operator(s)
File name STCK05_20250827-183849.ft
Comment

Beam 1	
Beam 2	

Automated beam check Start time 8/27/2025 5:40:32 PM



Automated beam check Quality control warnings
 No quality control warnings

8/28/2025 8:58:12 AM



Discharge Measurement Summary

Site name STCK05
Site number 1
Operator(s) DM
File name STCK05_20250912-182615.ft
Comment

Start time	9/12/2025 5:40 PM	Sensor type	Top Setting
End time	9/12/2025 6:24 PM	Handheld serial number	FT2H2126012
Start location latitude	39.711	Probe serial number	FT2P2127007
Start location longitude	-122.009	Probe firmware	1.30
Calculations engine	FlowTracker2	Handheld software	2.0

# Stations	Avg interval (s)	Total discharge (ft³/s)
30	40	72.7015

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
81.500	60.1400	81.558

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
23	0.738	1.2089

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
82.323	1.100	1.6721

Discharge Uncertainty		
Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.2%	2.4%
Velocity	0.3%	0.9%
Width	0.1%	0.1%
Method	1.5%	
# Stations	1.7%	
Overall	2.5%	2.7%

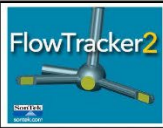
Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview

No changes were made to this file

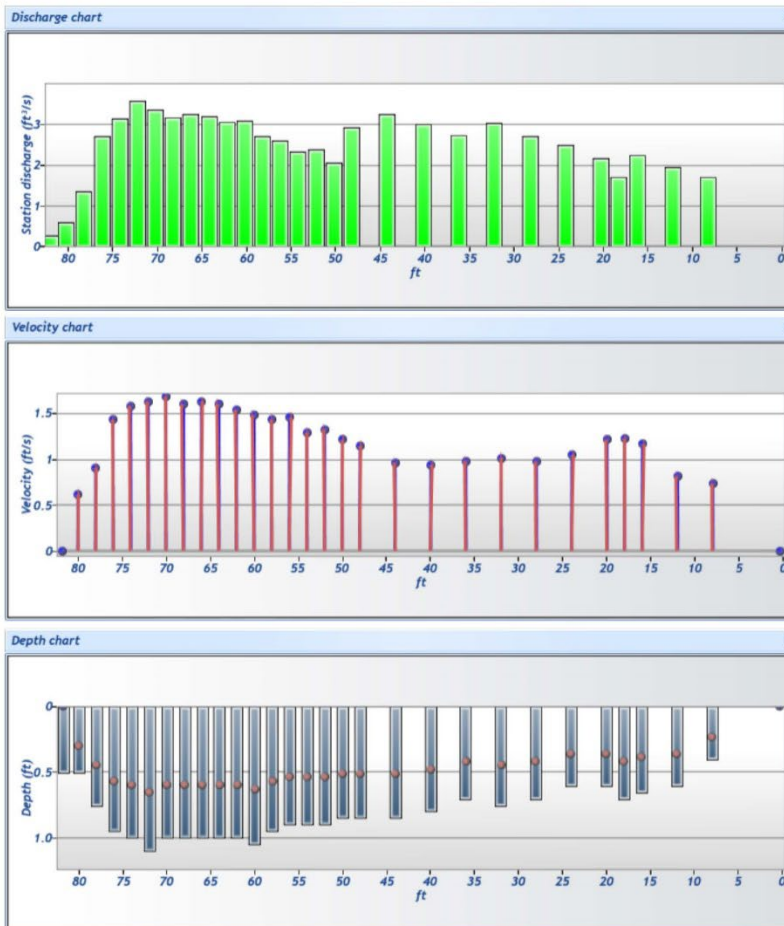
9/15/2025 8:45:12 AM



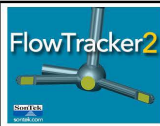
Discharge Measurement Summary

Site name STCK05
Site number 1
Operator(s) DM
File name STCK05_20250912-182615.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



9/15/2025 8:45:12 AM



Discharge Measurement Summary

Site name STCK05
Site number 1
Operator(s) DM
File name STCK05_20250912-182615.ft
Comment

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft ²)	Flow (ft ³ /s)	%Q	
0	5:40 PM	0.300	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.7323	0.0000	0.0000	0.00	✓
1	5:41 PM	8.000	0.6	0.400	0.6000	0.240	80	0.7323	1.0000	0.7323	2.3400	1.7135	2.36	✓
2	6:24 PM	12.000	0.6	0.600	0.6000	0.360	80	0.8095	1.0000	0.8095	2.4000	1.9428	2.67	✓
3	5:42 PM	16.000	0.6	0.650	0.6000	0.390	80	1.1565	1.0000	1.1565	1.9500	2.2552	3.10	✓
4	6:09 PM	18.000	0.6	0.700	0.6000	0.420	80	1.2213	1.0000	1.2213	1.4000	1.7098	2.35	✓
5	6:08 PM	20.000	0.6	0.600	0.6000	0.360	80	1.2051	1.0000	1.2051	1.8000	2.1692	2.98	✓
6	5:43 PM	24.000	0.6	0.600	0.6000	0.360	80	1.0427	1.0000	1.0427	2.4000	2.5026	3.44	✓
7	6:06 PM	28.000	0.6	0.700	0.6000	0.420	80	0.9664	1.0000	0.9664	2.8000	2.7060	3.72	✓
8	5:44 PM	32.000	0.6	0.750	0.6000	0.450	80	1.0121	1.0000	1.0121	3.0000	3.0364	4.18	✓
9	6:05 PM	36.000	0.6	0.700	0.6000	0.420	80	0.9738	1.0000	0.9738	2.8000	2.7267	3.75	✓
10	5:47 PM	40.000	0.6	0.800	0.6000	0.480	80	0.9368	1.0000	0.9368	3.2000	2.9978	4.12	✓
11	6:03 PM	44.000	0.6	0.850	0.6000	0.510	80	0.9564	1.0000	0.9564	3.4000	3.2519	4.47	✓
12	5:48 PM	48.000	0.6	0.850	0.6000	0.510	80	1.1432	1.0000	1.1432	2.5500	2.9153	4.01	✓
13	6:12 PM	50.000	0.6	0.850	0.6000	0.510	80	1.2039	1.0000	1.2039	1.7000	2.0466	2.82	✓
14	6:01 PM	52.000	0.6	0.900	0.6000	0.540	80	1.3222	1.0000	1.3222	1.8000	2.3799	3.27	✓
15	6:22 PM	54.000	0.6	0.900	0.6000	0.540	80	1.2861	1.0000	1.2861	1.8000	2.3149	3.18	✓
16	5:49 PM	56.000	0.6	0.900	0.6000	0.540	80	1.4446	1.0000	1.4446	1.8000	2.6003	3.58	✓
17	6:13 PM	58.000	0.6	0.950	0.6000	0.570	80	1.4255	1.0000	1.4255	1.9000	2.7085	3.73	✓
18	6:00 PM	60.000	0.6	1.050	0.6000	0.630	80	1.4734	1.0000	1.4734	2.1000	3.0941	4.26	✓
19	6:15 PM	62.000	0.6	1.000	0.6000	0.600	80	1.5278	1.0000	1.5278	2.0000	3.0556	4.20	✓
20	5:51 PM	64.000	0.6	1.000	0.6000	0.600	80	1.5967	1.0000	1.5967	2.0000	3.1934	4.39	✓
21	6:16 PM	66.000	0.6	1.000	0.6000	0.600	80	1.6208	1.0000	1.6208	2.0000	3.2416	4.46	✓
22	5:58 PM	68.000	0.6	1.000	0.6000	0.600	80	1.5876	1.0000	1.5876	2.0000	3.1751	4.37	✓
23	6:18 PM	70.000	0.6	1.000	0.6000	0.600	80	1.6721	1.0000	1.6721	2.0000	3.3442	4.60	✓
24	5:52 PM	72.000	0.6	1.100	0.6000	0.660	80	1.6189	1.0000	1.6189	2.2000	3.5616	4.90	✓
25	6:19 PM	74.000	0.6	1.000	0.6000	0.600	80	1.5713	1.0000	1.5713	2.0000	3.1426	4.32	✓
26	5:57 PM	76.000	0.6	0.950	0.6000	0.570	80	1.4222	1.0000	1.4222	1.9000	2.7022	3.72	✓
27	6:20 PM	78.000	0.6	0.750	0.6000	0.450	80	0.9000	1.0000	0.9000	1.5000	1.3500	1.86	✓
28	5:54 PM	80.000	0.6	0.500	0.6000	0.300	80	0.6170	1.0000	0.6170	0.9500	0.5861	0.81	✓
29	5:56 PM	81.800	None	0.500	0.0000	0.000	0	0.0000	1.0000	0.6170	0.4500	0.2776	0.38	✓

9/15/2025 8:45:12 AM



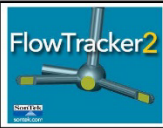
Discharge Measurement Summary

Site name STCK05
Site number 1
Operator(s) DM
File name STCK05_20250912-182615.ft
Comment

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	15.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings							
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
No quality control warnings							

9/15/2025 8:45:12 AM

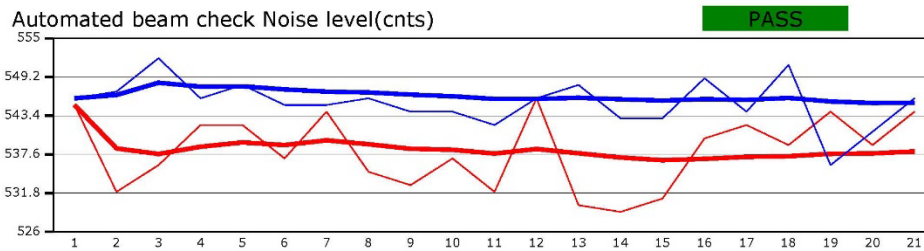
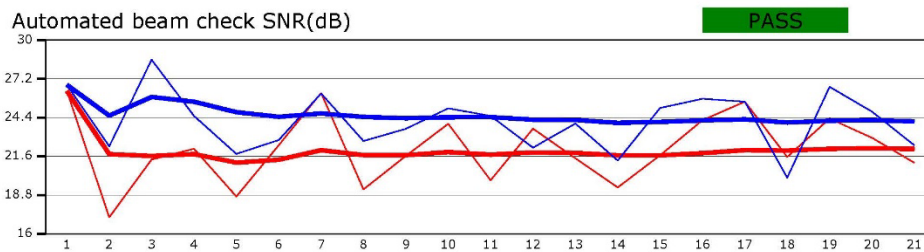


Discharge Measurement Summary

Site name STCK05
Site number 1
Operator(s) DM
File name STCK05_20250912-182615.ft
Comment

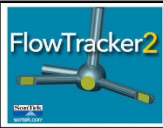
Beam 1	
Beam 2	

Automated beam check Start time 9/12/2025 5:39:22 PM



Automated beam check Quality control warnings
 No quality control warnings

9/15/2025 8:45:12 AM

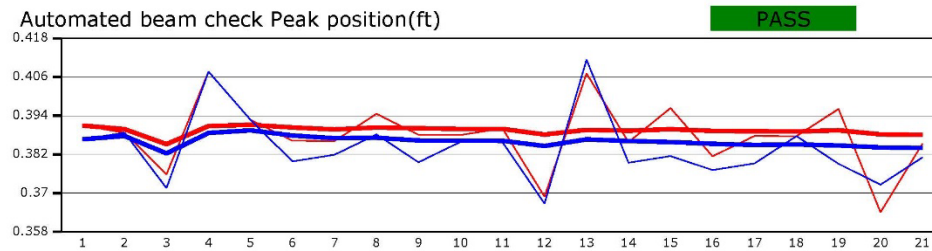
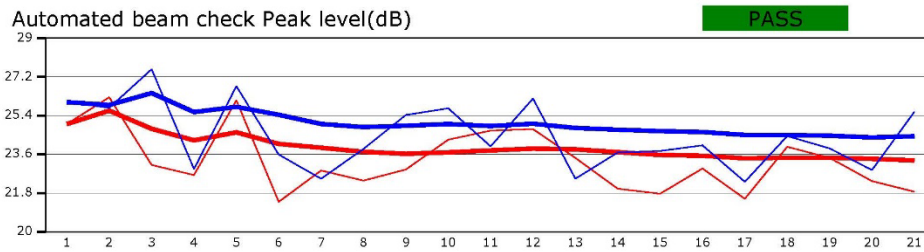


Discharge Measurement Summary

Site name STCK05
Site number 1
Operator(s) DM
File name STCK05_20250912-182615.ft
Comment

Beam 1	
Beam 2	

Automated beam check Start time 9/12/2025 5:39:22 PM



Automated beam check Quality control warnings
 No quality control warnings

9/15/2025 8:45:12 AM

6.1.2 Thomes Creek

6.1.2.1 TMCK01

Discharge Measurement Summary

Site name	1139.14.03.03-TMCK01
Site number	
Operator(s)	
File name	1139_14_03_03-TMCK01_20240620-153718.ft
Comment	

Start time	6/20/2024 2:11 PM	Sensor type	Top Setting
End time	6/20/2024 3:30 PM	Handheld serial number	FT2H2126012
Start location latitude	39.895	Probe serial number	FT2P2127007
Start location longitude	-122.510	Probe firmware	1.30
Calculations engine	FlowTracker2	Handheld software	1.7

# Stations	Avg interval (s)	Total discharge (ft³/s)
33	40	60.4142

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
50.700	57.8975	52.029

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
32	1.142	1.0435

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
77.872	2.400	2.0445

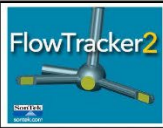
Discharge Uncertainty		
Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.1%	2.1%
Velocity	0.4%	2.1%
Width	0.1%	0.1%
Method	1.2%	
# Stations	1.6%	
Overall	2.3%	3.1%

Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview
No changes were made to this file
Quality control warnings

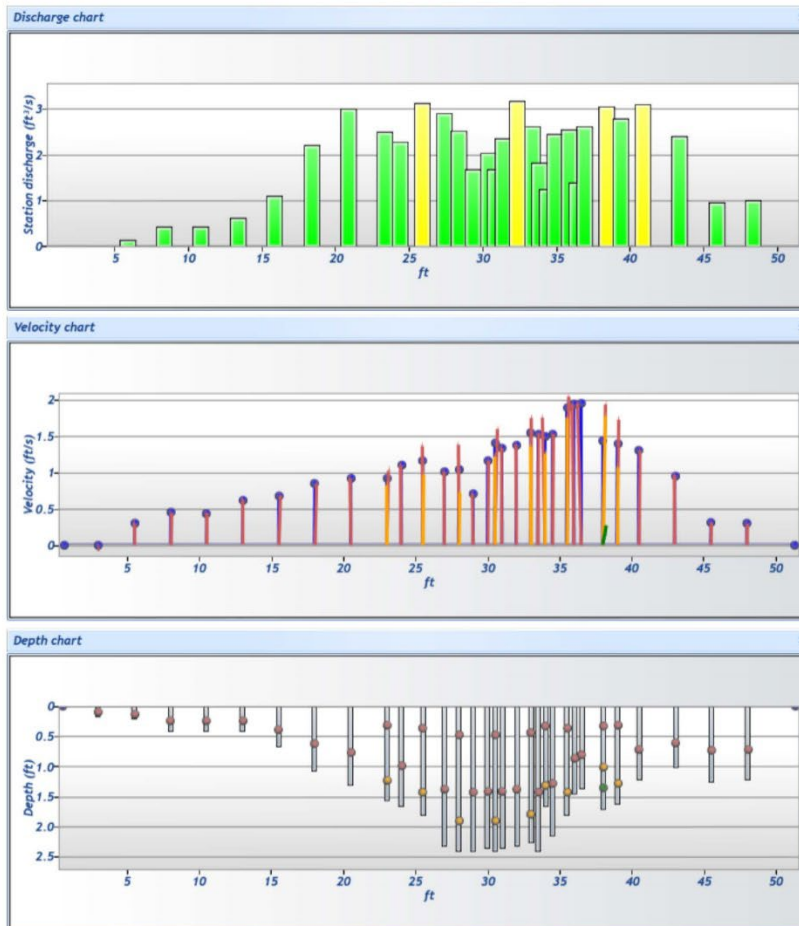
6/4/2025 3:17:22 PM



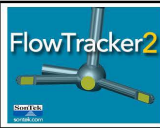
Discharge Measurement Summary

Site name 1139.14.03.03-TMCK01
Site number
Operator(s)
File name 1139_14_03_03-TMCK01_20240620-153718.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



6/4/2025 3:17:22 PM



Discharge Measurement Summary

Site name 1139.14.03.03-TMCK01
Site number
Operator(s)
File name 1139_14_03_03-TMCK01_20240620-153718.ft
Comment

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q
0	2:11 PM	0.600	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.0022	0.0000	0.0000	0.00 ✓
1	2:12 PM	3.000	0.6	0.150	0.6000	0.090	80	0.0022	1.0000	0.0022	0.3675	0.0008	0.00 ✓
2	2:17 PM	5.500	0.6	0.200	0.6000	0.120	80	0.3019	1.0000	0.3019	0.5000	0.1510	0.25 ✓
3	2:20 PM	8.000	0.6	0.400	0.6000	0.240	80	0.4445	1.0000	0.4445	1.0000	0.4445	0.74 ✓
4	2:22 PM	10.500	0.6	0.400	0.6000	0.240	80	0.4396	1.0000	0.4396	1.0000	0.4396	0.73 ✓
5	2:24 PM	13.000	0.6	0.400	0.6000	0.240	80	0.6247	1.0000	0.6247	1.0000	0.6247	1.03 ✓
6	2:25 PM	15.500	0.6	0.650	0.6000	0.390	80	0.6817	1.0000	0.6817	1.6250	1.1078	1.83 ✓
7	2:27 PM	18.000	0.6	1.050	0.6000	0.630	80	0.8430	1.0000	0.8430	2.6250	2.2129	3.66 ✓
8	2:29 PM	20.500	0.6	1.300	0.6000	0.780	80	0.9263	1.0000	0.9263	3.2500	3.0104	4.98 ✓
9	2:31 PM	23.000	0.2/0.8	1.550	0.2000	0.310	80	1.0290	1.0000	0.9267	2.7125	2.5137	4.16 ✓
9	2:31 PM	23.000	0.2/0.8	1.550	0.8000	1.240	80	0.8245	1.0000	0.9267	2.7125	2.5137	4.16 ✓
10	3:30 PM	24.000	0.6	1.650	0.6000	0.990	80	1.1048	1.0000	1.1048	2.0625	2.2786	3.77 ✓
11	2:34 PM	25.500	0.2/0.8	1.800	0.2000	0.360	80	1.3595	1.0000	1.1624	2.7000	3.1386	5.20 ✓
11	2:34 PM	25.500	0.2/0.8	1.800	0.8000	1.440	80	0.9654	1.0000	1.1624	2.7000	3.1386	5.20 ✓
12	3:28 PM	27.000	0.6	2.300	0.6000	1.380	80	1.0114	1.0000	1.0114	2.8750	2.9078	4.81 ✓
13	2:38 PM	28.000	0.2/0.8	2.400	0.2000	0.480	80	1.3803	1.0000	1.0518	2.4000	2.5243	4.18 ✓
13	2:38 PM	28.000	0.2/0.8	2.400	0.8000	1.920	80	0.7233	1.0000	1.0518	2.4000	2.5243	4.18 ✓
14	3:27 PM	29.000	0.6	2.400	0.6000	1.440	80	0.7055	1.0000	0.7055	2.4000	1.6931	2.80 ✓
15	3:25 PM	30.000	0.6	2.350	0.6000	1.410	80	1.1613	1.0000	1.1613	1.7625	2.0469	3.39 ✓
16	2:41 PM	30.500	0.2/0.8	2.400	0.2000	0.480	80	1.5972	1.0000	1.4056	1.2000	1.6868	2.79 ✓
16	2:41 PM	30.500	0.2/0.8	2.400	0.8000	1.920	80	1.2141	1.0000	1.4056	1.2000	1.6868	2.79 ✓
17	3:23 PM	31.000	0.6	2.350	0.6000	1.410	80	1.3388	1.0000	1.3388	1.7625	2.3596	3.91 ✓
18	3:20 PM	32.000	0.6	2.300	0.6000	1.380	80	1.3789	1.0000	1.3789	2.3000	3.1715	5.25 ✓
19	2:44 PM	33.000	0.2/0.8	2.250	0.2000	0.450	80	1.7471	1.0000	1.5501	1.6875	2.6158	4.33 ✓
19	2:44 PM	33.000	0.2/0.8	2.250	0.8000	1.800	80	1.3531	1.0000	1.5501	1.6875	2.6158	4.33 ✓
20	3:18 PM	33.500	0.6	2.400	0.6000	1.440	80	1.5356	1.0000	1.5356	1.2000	1.8428	3.05 ✓
21	3:11 PM	34.000	0.2/0.8	1.650	0.2000	0.330	80	1.7526	1.0000	1.5040	0.8250	1.2408	2.05 ✓
21	3:11 PM	34.000	0.2/0.8	1.650	0.8000	1.320	80	1.2555	1.0000	1.5040	0.8250	1.2408	2.05 ✓
22	3:15 PM	34.500	0.6	2.150	0.6000	1.290	80	1.5273	1.0000	1.5273	1.6125	2.4628	4.08 ✓
23	2:47 PM	35.500	0.2/0.8	1.800	0.2000	0.360	80	2.0445	1.0000	1.8968	1.3500	2.5606	4.24 ✓
23	2:47 PM	35.500	0.2/0.8	1.800	0.8000	1.440	80	1.7490	1.0000	1.8968	1.3500	2.5606	4.24 ✓
24	3:08 PM	36.000	0.6	1.450	0.6000	0.870	80	1.9412	1.0000	1.9412	0.7250	1.4074	2.33 ✓
25	3:06 PM	36.500	0.6	1.350	0.6000	0.810	80	1.9536	1.0000	1.9536	1.3500	2.6374	4.37 ✓
26	2:50 PM	38.000	0.2/0.6/0.8	1.700	0.2000	0.340	80	1.9364	1.0000	1.4356	2.1250	3.0507	5.05 ✓
26	2:50 PM	38.000	0.2/0.6/0.8	1.700	0.6000	1.020	80	1.7680	1.0000	1.4356	2.1250	3.0507	5.05 ✓
26	2:50 PM	38.000	0.2/0.6/0.8	1.700	0.8000	1.360	80	0.2700	1.0000	1.4356	2.1250	3.0507	5.05 ✓
27	3:02 PM	39.000	0.2/0.8	1.600	0.2000	0.320	80	1.7252	1.0000	1.3961	2.0000	2.7922	4.62 ✓
27	3:02 PM	39.000	0.2/0.8	1.600	0.8000	1.280	80	1.0670	1.0000	1.3961	2.0000	2.7922	4.62 ✓
28	2:54 PM	40.500	0.6	1.200	0.6000	0.720	80	1.2983	1.0000	1.2983	2.4000	3.1160	5.16 ✓
29	2:56 PM	43.000	0.6	1.000	0.6000	0.600	80	0.9591	1.0000	0.9591	2.5000	2.3979	3.97 ✓
30	2:57 PM	45.500	0.6	1.240	0.6000	0.744	80	0.3093	1.0000	0.3093	3.1000	0.9589	1.59 ✓
31	2:58 PM	48.000	0.6	1.200	0.6000	0.720	80	0.2927	1.0000	0.2927	3.4800	1.0184	1.69 ✓
32	3:01 PM	51.300	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.2927	0.0000	0.0000	0.00 ✓

6/4/2025 3:17:22 PM

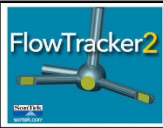
Discharge Measurement Summary

Site name 1139.14.03.03-TMCK01
Site number
Operator(s)
File name 1139_14_03_03-TMCK01_20240620-153718.ft
Comment

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	15.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings							
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	2:12 PM	3.000	0.6	0.150	0.6000	0.090	Boundary Interference, Large SNR Variation
11	2:34 PM	25.500	0.2/0.8	1.800	0.2000	0.360	Stn Spacing > QC
11	2:34 PM	25.500	0.2/0.8	1.800	0.8000	1.440	Stn Spacing > QC
13	2:38 PM	28.000	0.2/0.8	2.400	0.2000	0.480	Standard Error > QC
13	2:38 PM	28.000	0.2/0.8	2.400	0.8000	1.920	Standard Error > QC
14	3:27 PM	29.000	0.6	2.400	0.6000	1.440	Standard Error > QC
16	2:41 PM	30.500	0.2/0.8	2.400	0.2000	0.480	Standard Error > QC
16	2:41 PM	30.500	0.2/0.8	2.400	0.8000	1.920	Standard Error > QC
19	2:44 PM	33.000	0.2/0.8	2.250	0.2000	0.450	Standard Error > QC
19	2:44 PM	33.000	0.2/0.8	2.250	0.8000	1.800	Standard Error > QC
21	3:11 PM	34.000	0.2/0.8	1.650	0.2000	0.330	Standard Error > QC
21	3:11 PM	34.000	0.2/0.8	1.650	0.8000	1.320	Standard Error > QC
26	2:50 PM	38.000	0.2/0.6/0.8	1.700	0.2000	0.340	Standard Error > QC, Velocity Angle > QC
26	2:50 PM	38.000	0.2/0.6/0.8	1.700	0.6000	1.020	Standard Error > QC, Velocity Angle > QC
26	2:50 PM	38.000	0.2/0.6/0.8	1.700	0.8000	1.360	Standard Error > QC, Velocity Angle > QC
27	3:02 PM	39.000	0.2/0.8	1.600	0.2000	0.320	Standard Error > QC
27	3:02 PM	39.000	0.2/0.8	1.600	0.8000	1.280	Standard Error > QC
32	3:01 PM	51.300	None	0.000	0.0000	0.000	Water Depth > QC

6/4/2025 3:17:22 PM

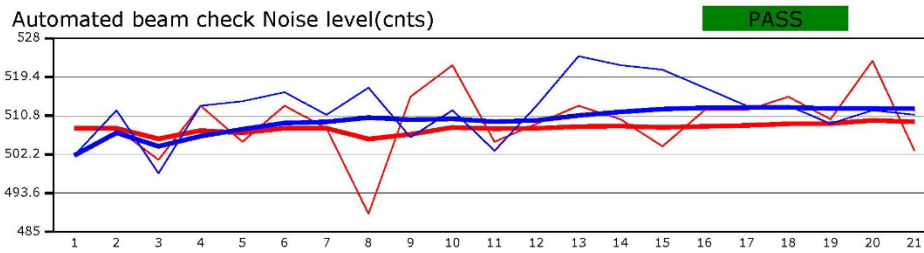
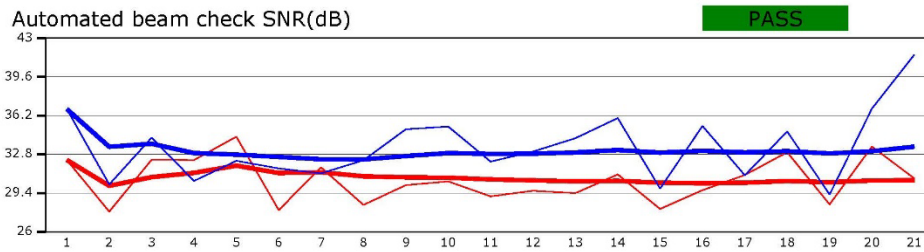


Discharge Measurement Summary

Site name 1139.14.03.03-TMCK01
Site number
Operator(s)
File name 1139_14_03_03-TMCK01_20240620-153718.ft
Comment

Beam 1	
Beam 2	

Automated beam check Start time 6/20/2024 2:11:20 PM



Automated beam check Quality control warnings
 No quality control warnings

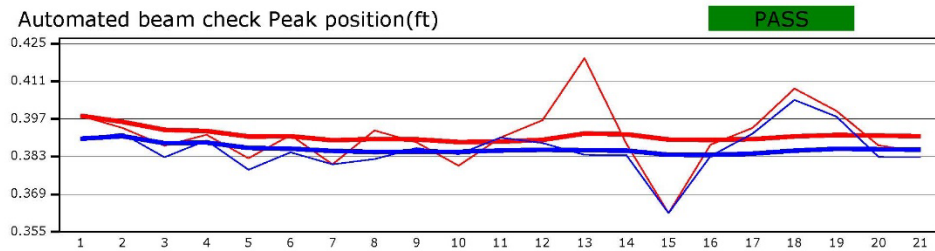
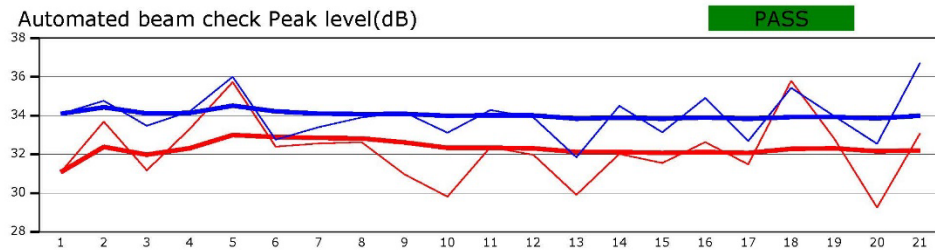
6/4/2025 3:17:22 PM

Discharge Measurement Summary

Site name	1139.14.03.03-TMCK01
Site number	
Operator(s)	
File name	1139_14_03_03-TMCK01_20240620-153718.ft
Comment	

Beam 1	
Beam 2	

Automated beam check Start time 6/20/2024 2:11:20 PM



Automated beam check Quality control warnings No quality control warnings

6/4/2025 3:17:22 PM

QRev Discharge Summary Note

Station Name: TMCK01

Site ID:

Total Q (ft³ / s): 249.702

Date: 05/09/2025

Estimated Uncertainty (%): 4.3



Transect Discharge

File Name	Start Time	End Time	Start Edge	Top Q (ft ³ / s)	Middle Q (ft ³ / s)	Bottom Q (ft ³ / s)	Total Q (ft ³ / s)
02-Transsect_20250509085212.mat	8:53:23	8:57:29	Left	69.95	133.122	42.344	250.838
03-Transsect_20250509085732.mat	8:57:42	9:02:26	Right	68.416	137.551	43.938	256.861
04-Transsect_20250509090229.mat	9:02:36	9:06:29	Left	70.585	136.262	45.336	255.574
05-Transsect_20250509090631.mat	9:06:39	9:11:32	Right	65.026	127.048	47.092	242.698
06-Transsect_20250509091135.mat	9:11:52	9:15:37	Left	70.009	132.65	43.68	249.617
07-Transsect_20250509091539.mat	9:15:47	9:20:15	Right	63.438	130.792	45.132	242.604
Mean	-	-	-	67.904	132.904	44.587	249.702

Measurement Details

Mean Measurement Depth (ft): 1.762

Maximum Measurement Depth (ft): 3.195

Total Measurement Duration (s): 1549.00

File Name	Mean Temp (°C)	Width (ft)	Area (ft ²)	Mean Boat Speed (ft/s)	Mean V (ft/s)	Invalid Depth Cells (%)	Invalid Ens (%)
02-Transsect_20250509085212.mat	16.4	86.291	153.348	0.535	1.636	3.5	2.4
03-Transsect_20250509085732.mat	16.4	86.864	152.361	0.453	1.686	2.8	1.8
04-Transsect_20250509090229.mat	16.4	86.645	152.33	0.472	1.678	4.5	5.1
05-Transsect_20250509090631.mat	16.4	84.913	150.074	0.433	1.617	3.3	2.4
06-Transsect_20250509091135.mat	16.5	85.221	147.207	0.482	1.696	3.1	2.2
07-Transsect_20250509091539.mat	16.5	84.09	150.422	0.441	1.613	4.6	3
Mean	16.4	85.671	150.957	0.469	1.654	3.6	2.8

Edges

File Name	Left Edge Type	Right Edge Type	Left Edge Distance (ft)	Right Edge Distance (ft)	Left Q (ft ³ / s)	Right Q (ft ³ / s)
02-Transsect_20250509085212.mat	Triangular	Rectangular	5	1.5	4.611	0.812
03-Transsect_20250509085732.mat	Triangular	Rectangular	5	1.5	4.598	2.379
04-Transsect_20250509090229.mat	Triangular	Rectangular	5	1.5	4.793	-1.402
05-Transsect_20250509090631.mat	Triangular	Rectangular	5	1.5	4.68	-1.148
06-Transsect_20250509091135.mat	Triangular	Rectangular	5	1.5	4.645	-1.367
07-Transsect_20250509091539.mat	Triangular	Rectangular	5	1.5	4.716	-1.475
Mean	-	-	5	1.5	4.674	-0.367

Processing

Software:QRev 4.38
Navigation Reference:BT
Composite Tracks:Off
Magnetic Variation:13.40
Salinity:0.0
Depth Reference:BT
Extrapolation Method
(Top/Bottom Exponent):
Constant / No Slip Exp: 0.1731

Instrument Details

Model:RS5
Frequency:Multi
Serial Number:RS52441001
Firmware Version:1.51
Instrument Configuration:

Quality Assurance

Diagnostic Test Results:Pass
Compass Calibration Results:Yes
Moving Bed Test Type:Stationary
Moving Bed Condition:No

User Comments

QRev Messages

Temperature: No independent temperature reading;Site Info: Station number not entered;
QRev Summary File: 20250602_094837_438_QRev



Discharge Measurement Summary

Site name
Site number TMCK01
Operator(s) SC
File name TMCK01_20250821-102931.ft
Comment

Start time	8/21/2025 8:14 AM	Sensor type	Top Setting
End time	8/21/2025 9:34 AM	Handheld serial number	FT2H2126012
Start location latitude	39.895	Probe serial number	FT2P2127007
Start location longitude	-122.510	Probe firmware	1.30
Calculations engine	FlowTracker2	Handheld software	2.0

# Stations	Avg interval (s)	Total discharge (ft³/s)
43	40	8.3067

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
24.800	29.0475	25.419

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
23	1.171	0.2860

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
74.226	1.800	1.0036

Discharge Uncertainty		
Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.1%	1.5%
Velocity	0.7%	3.5%
Width	0.1%	0.1%
Method	1.2%	
# Stations	1.2%	
Overall	2.1%	3.9%

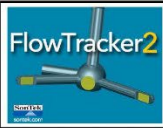
Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview

No changes were made to this file
 Quality control warnings

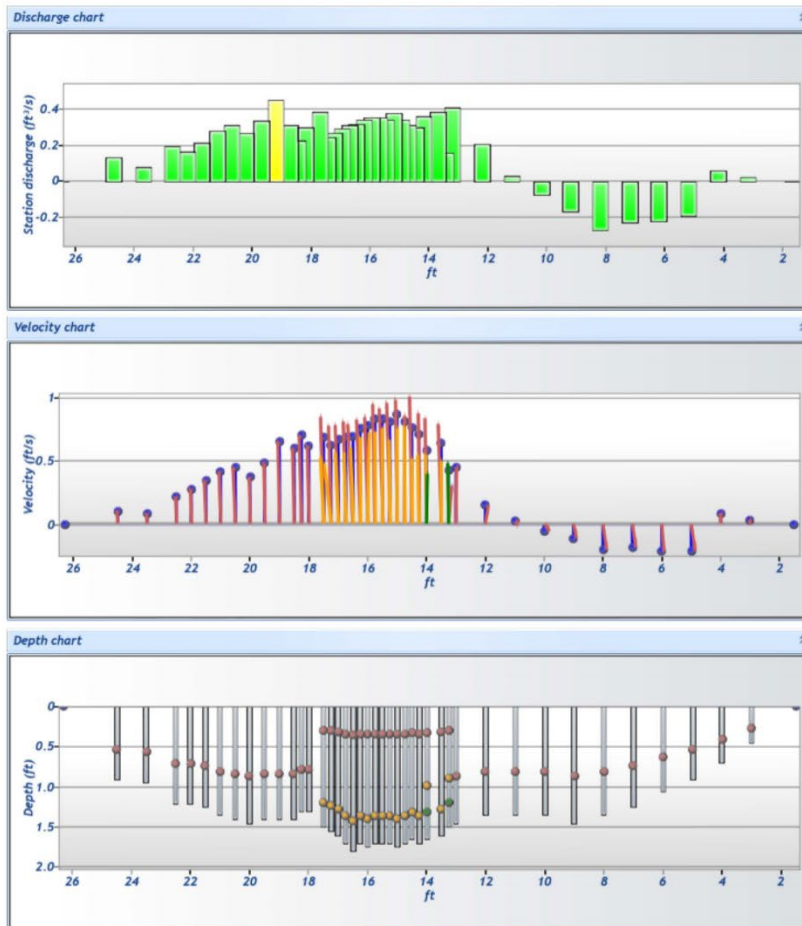
8/25/2025 9:47:06 AM



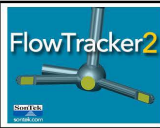
Discharge Measurement Summary

Site name
Site number TMCK01
Operator(s) SC
File name TMCK01_20250821-102931.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



8/25/2025 9:47:06 AM



Discharge Measurement Summary

Site name
Site number TMCK01
Operator(s) SC
File name TMCK01_20250821-102931.ft
Comment

Measurement results													
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft ²)	Flow (ft ³ /s)	%Q
0	8:14 AM	1.500	None	0.000	0.0000	0.000	0	0.0000	0.8000	0.0294	0.0000	0.000	✓
1	8:15 AM	3.000	0.6	0.450	0.6000	0.270	80	0.0367	1.0000	0.0367	0.5625	0.0207	0.25 ✓
2	8:17 AM	4.000	0.6	0.700	0.6000	0.420	80	0.0867	1.0000	0.0867	0.7000	0.0607	0.73 ✓
3	8:19 AM	5.000	0.6	0.900	0.6000	0.540	80	-0.2113	1.0000	-0.2113	0.9000	-0.1901	-2.29 ✓
4	8:21 AM	6.000	0.6	1.050	0.6000	0.630	80	-0.2125	1.0000	-0.2125	1.0500	-0.2231	-2.69 ✓
5	8:22 AM	7.000	0.6	1.250	0.6000	0.750	80	-0.1848	1.0000	-0.1848	1.2500	-0.2310	-2.78 ✓
6	8:24 AM	8.000	0.6	1.350	0.6000	0.810	80	-0.2007	1.0000	-0.2007	1.3500	-0.2709	-3.26 ✓
7	8:25 AM	9.000	0.6	1.450	0.6000	0.870	80	-0.1153	1.0000	-0.1153	1.4500	-0.1672	-2.01 ✓
8	8:27 AM	10.000	0.6	1.350	0.6000	0.810	80	-0.0573	1.0000	-0.0573	1.3500	-0.0774	-0.93 ✓
9	8:28 AM	11.000	0.6	1.350	0.6000	0.810	80	0.0228	1.0000	0.0228	1.3500	0.0308	0.37 ✓
10	8:29 AM	12.000	0.6	1.350	0.6000	0.810	80	0.1523	1.0000	0.1523	1.3500	0.2056	2.48 ✓
11	8:31 AM	13.000	0.6	1.450	0.6000	0.870	80	0.4503	1.0000	0.4503	0.9063	0.4081	4.91 ✓
12	9:34 AM	13.250	0.2/0.6/0.8	1.500	0.2000	0.300	80	0.3007	1.0000	0.4241	0.3750	0.1590	1.91 ✓
12	9:34 AM	13.250	0.2/0.6/0.8	1.500	0.6000	0.900	80	0.4580	1.0000	0.4241	0.3750	0.1590	1.91 ✓
12	9:34 AM	13.250	0.2/0.6/0.8	1.500	0.8000	1.200	80	0.4796	1.0000	0.4241	0.3750	0.1590	1.91 ✓
13	9:09 AM	13.500	0.2/0.8	1.600	0.2000	0.320	80	0.7883	1.0000	0.6407	0.6000	0.3844	4.63 ✓
13	9:09 AM	13.500	0.2/0.8	1.600	0.8000	1.280	80	0.4931	1.0000	0.6407	0.6000	0.3844	4.63 ✓
14	8:32 AM	14.000	0.2/0.6/0.8	1.650	0.2000	0.330	80	0.8322	1.0000	0.5816	0.6188	0.3599	4.33 ✓
14	8:32 AM	14.000	0.2/0.6/0.8	1.650	0.6000	0.990	80	0.5496	1.0000	0.5816	0.6188	0.3599	4.33 ✓
14	8:32 AM	14.000	0.2/0.6/0.8	1.650	0.8000	1.320	80	0.3950	1.0000	0.5816	0.6188	0.3599	4.33 ✓
15	9:12 AM	14.250	0.2/0.8	1.700	0.2000	0.340	80	0.8721	1.0000	0.7073	0.4250	0.3006	3.62 ✓
15	9:12 AM	14.250	0.2/0.8	1.700	0.8000	1.360	80	0.5424	1.0000	0.7073	0.4250	0.3006	3.62 ✓
16	8:36 AM	14.500	0.2/0.8	1.650	0.2000	0.330	80	1.0036	1.0000	0.7592	0.4125	0.3132	3.77 ✓
16	8:36 AM	14.500	0.2/0.8	1.650	0.8000	1.320	80	0.5147	1.0000	0.7592	0.4125	0.3132	3.77 ✓
17	9:26 AM	14.750	0.2/0.8	1.700	0.2000	0.340	80	0.8534	1.0000	0.8091	0.4250	0.3439	4.14 ✓
17	9:26 AM	14.750	0.2/0.8	1.700	0.8000	1.360	80	0.7649	1.0000	0.8091	0.4250	0.3439	4.14 ✓
18	8:38 AM	15.000	0.2/0.8	1.750	0.2000	0.350	80	0.9784	1.0000	0.8664	0.4375	0.3790	4.56 ✓
18	8:38 AM	15.000	0.2/0.8	1.750	0.8000	1.400	80	0.7543	1.0000	0.8664	0.4375	0.3790	4.56 ✓
19	9:14 AM	15.250	0.2/0.8	1.700	0.2000	0.340	80	0.9540	1.0000	0.8085	0.4250	0.3436	4.14 ✓
19	9:14 AM	15.250	0.2/0.8	1.700	0.8000	1.360	80	0.6630	1.0000	0.8085	0.4250	0.3436	4.14 ✓
20	8:40 AM	15.500	0.2/0.8	1.700	0.2000	0.340	80	0.9103	1.0000	0.8326	0.4250	0.3539	4.26 ✓
20	8:40 AM	15.500	0.2/0.8	1.700	0.8000	1.360	80	0.7550	1.0000	0.8326	0.4250	0.3539	4.26 ✓
21	9:28 AM	15.750	0.2/0.8	1.700	0.2000	0.340	80	0.9451	1.0000	0.8350	0.4250	0.3549	4.27 ✓
21	9:28 AM	15.750	0.2/0.8	1.700	0.8000	1.360	80	0.7249	1.0000	0.8350	0.4250	0.3549	4.27 ✓
22	8:43 AM	16.000	0.2/0.8	1.750	0.2000	0.350	80	0.8423	1.0000	0.7833	0.4375	0.3427	4.13 ✓
22	8:43 AM	16.000	0.2/0.8	1.750	0.8000	1.400	80	0.7243	1.0000	0.7833	0.4375	0.3427	4.13 ✓
23	9:17 AM	16.250	0.2/0.8	1.700	0.2000	0.340	80	0.8230	1.0000	0.7528	0.4250	0.3200	3.85 ✓
23	9:17 AM	16.250	0.2/0.8	1.700	0.8000	1.360	80	0.6826	1.0000	0.7528	0.4250	0.3200	3.85 ✓
24	8:45 AM	16.500	0.2/0.8	1.800	0.2000	0.360	80	0.7875	1.0000	0.6945	0.4500	0.3125	3.76 ✓
24	8:45 AM	16.500	0.2/0.8	1.800	0.8000	1.440	80	0.6014	1.0000	0.6945	0.4500	0.3125	3.76 ✓
25	9:31 AM	16.750	0.2/0.8	1.700	0.2000	0.340	80	0.8063	1.0000	0.6847	0.4250	0.2910	3.50 ✓
25	9:31 AM	16.750	0.2/0.8	1.700	0.8000	1.360	80	0.5631	1.0000	0.6847	0.4250	0.2910	3.50 ✓
26	8:47 AM	17.000	0.2/0.8	1.600	0.2000	0.320	80	0.7775	1.0000	0.6696	0.4000	0.2678	3.22 ✓
26	8:47 AM	17.000	0.2/0.8	1.600	0.8000	1.280	80	0.5616	1.0000	0.6696	0.4000	0.2678	3.22 ✓
27	9:20 AM	17.250	0.2/0.8	1.550	0.2000	0.310	80	0.7743	1.0000	0.6253	0.3875	0.2423	2.92 ✓
27	9:20 AM	17.250	0.2/0.8	1.550	0.8000	1.240	80	0.4764	1.0000	0.6253	0.3875	0.2423	2.92 ✓
28	8:50 AM	17.500	0.2/0.8	1.500	0.2000	0.300	80	0.8438	1.0000	0.6845	0.5625	0.3850	4.64 ✓
28	8:50 AM	17.500	0.2/0.8	1.500	0.8000	1.200	80	0.5252	1.0000	0.6845	0.5625	0.3850	4.64 ✓
29	8:52 AM	18.000	0.6	1.300	0.6000	0.780	80	0.6186	1.0000	0.6186	0.4875	0.3016	3.63 ✓
30	9:23 AM	18.250	0.6	1.300	0.6000	0.780	80	0.6977	1.0000	0.6977	0.3250	0.2268	2.73 ✓
31	8:54 AM	18.500	0.6	1.400	0.6000	0.840	80	0.5993	1.0000	0.5993	0.5250	0.3146	3.79 ✓
32	8:55 AM	19.000	0.6	1.400	0.6000	0.840	80	0.6507	1.0000	0.6507	0.7000	0.4555	5.48 ✓
33	8:56 AM	19.500	0.6	1.400	0.6000	0.840	80	0.4838	1.0000	0.4838	0.7000	0.3386	4.08 ✓
34	8:57 AM	20.000	0.6	1.450	0.6000	0.870	80	0.3690	1.0000	0.3690	0.7250	0.2675	3.22 ✓
35	8:58 AM	20.500	0.6	1.400	0.6000	0.840	80	0.4491	1.0000	0.4491	0.7000	0.3144	3.78 ✓
36	9:00 AM	21.000	0.6	1.350	0.6000	0.810	80	0.4127	1.0000	0.4127	0.6750	0.2785	3.35 ✓
37	9:01 AM	21.500	0.6	1.250	0.6000	0.750	80	0.3446	1.0000	0.3446	0.6250	0.2154	2.59 ✓
38	9:02 AM	22.000	0.6	1.200	0.6000	0.720	80	0.2789	1.0000	0.2789	0.6000	0.1673	2.01 ✓
39	9:03 AM	22.500	0.6	1.200	0.6000	0.720	80	0.2164	1.0000	0.2164	0.9000	0.1948	2.35 ✓
40	9:05 AM	23.500	0.6	0.950	0.6000	0.570	80	0.0840	1.0000	0.0840	0.9500	0.0798	0.96 ✓
41	9:06 AM	24.500	0.6	0.900	0.6000	0.540	80	0.1047	1.0000	0.1047	1.2600	0.1320	1.59 ✓
42	9:08 AM	26.300	None	0.000	0.0000	0.000	0	0.0000	0.8000	0.0838	0.0000	0.0000	0.00 ✓

8/25/2025 9:47:06 AM



Discharge Measurement Summary

Site name
Site number TMCK01
Operator(s) SC
File name TMCK01_20250821-102931.ft
Comment

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	20.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings							
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	8:15 AM	3.000	0.6	0.450	0.6000	0.270	SNR Threshold Variation
3	8:19 AM	5.000	0.6	0.900	0.6000	0.540	Large SNR Variation, Velocity Angle > QC
4	8:21 AM	6.000	0.6	1.050	0.6000	0.630	Velocity Angle > QC
5	8:22 AM	7.000	0.6	1.250	0.6000	0.750	Velocity Angle > QC
6	8:24 AM	8.000	0.6	1.350	0.6000	0.810	Velocity Angle > QC
7	8:25 AM	9.000	0.6	1.450	0.6000	0.870	Velocity Angle > QC
8	8:27 AM	10.000	0.6	1.350	0.6000	0.810	Large SNR Variation
9	8:28 AM	11.000	0.6	1.350	0.6000	0.810	Large SNR Variation, SNR Threshold Variation
10	8:29 AM	12.000	0.6	1.350	0.6000	0.810	Large SNR Variation, Velocity Angle > QC
12	9:34 AM	13.250	0.2/0.6/0.8	1.500	0.2000	0.300	Velocity Angle > QC
12	9:34 AM	13.250	0.2/0.6/0.8	1.500	0.6000	0.900	Velocity Angle > QC
12	9:34 AM	13.250	0.2/0.6/0.8	1.500	0.8000	1.200	Velocity Angle > QC
13	9:09 AM	13.500	0.2/0.8	1.600	0.2000	0.320	Stn Spacing > QC, Large SNR Variation
13	9:09 AM	13.500	0.2/0.8	1.600	0.8000	1.280	Stn Spacing > QC, Large SNR Variation
16	8:36 AM	14.500	0.2/0.8	1.650	0.2000	0.330	Standard Error > QC
16	8:36 AM	14.500	0.2/0.8	1.650	0.8000	1.320	Standard Error > QC
24	8:45 AM	16.500	0.2/0.8	1.800	0.2000	0.360	Boundary Interference
24	8:45 AM	16.500	0.2/0.8	1.800	0.8000	1.440	Boundary Interference
27	9:20 AM	17.250	0.2/0.8	1.550	0.2000	0.310	Velocity Angle > QC
27	9:20 AM	17.250	0.2/0.8	1.550	0.8000	1.240	Velocity Angle > QC
31	8:54 AM	18.500	0.6	1.400	0.6000	0.840	Boundary Interference
40	9:05 AM	23.500	0.6	0.950	0.6000	0.570	Velocity Angle > QC
42	9:08 AM	26.300	None	0.000	0.0000	0.000	Water Depth > QC

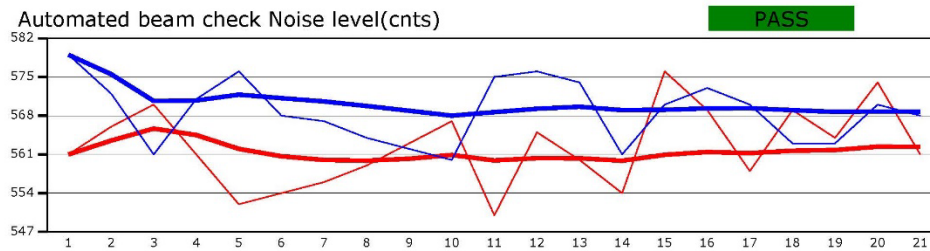
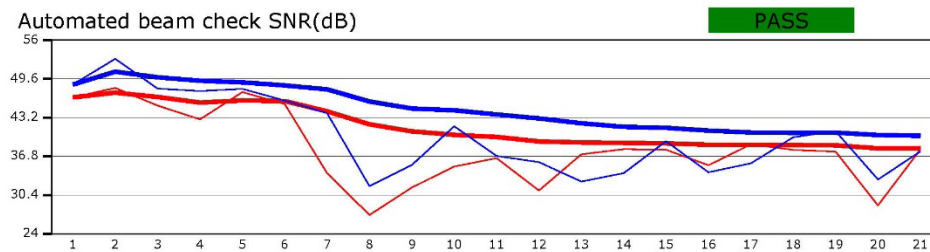
8/25/2025 9:47:06 AM

Discharge Measurement Summary

Site name	
Site number	TMCK01
Operator(s)	SC
File name	TMCK01_20250821-102931.ft
Comment	

Beam 1	
Beam 2	

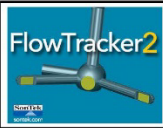
Automated beam check Start time 8/21/2025 8:14:31 AM



Automated beam check Quality control warnings

No quality control warnings

8/25/2025 9:47:06 AM

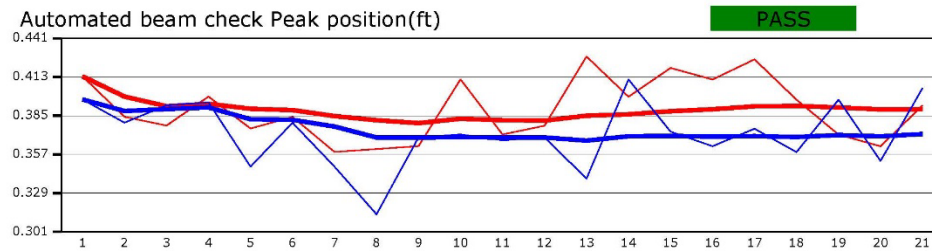
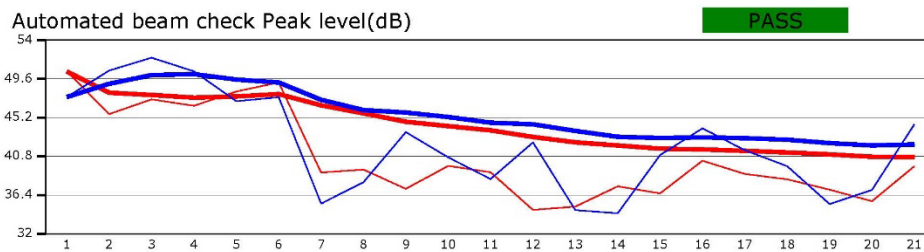


Discharge Measurement Summary

Site name
Site number TMCK01
Operator(s) SC
File name TMCK01_20250821-102931.ft
Comment

Beam 1	
Beam 2	

Automated beam check Start time 8/21/2025 8:14:31 AM



Automated beam check Quality control warnings
 No quality control warnings

8/25/2025 9:47:06 AM

6.1.2.2 TMCK02

	Discharge Measurement Summary
---	---

Site name	1139.14.03.03-TMCK02
Site number	
Operator(s)	
File name	1139_14_03_03-TMCK02_20240620-171340.ft
Comment	

Start time 6/20/2024 4:13 PM End time 6/20/2024 5:11 PM Start location latitude 39.919 Start location longitude -122.428 Calculations engine FlowTracker2	Sensor type Top Setting Handheld serial number FT2H2126012 Probe serial number FT2P2127007 Probe firmware 1.30 Handheld software 1.7
--	---

# Stations	Avg interval (s)	Total discharge (ft³/s)
36	40	55.6216

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
45.300	37.3900	46.095

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
30	0.825	1.4876

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
80.619	1.800	2.2222

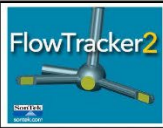
Discharge Uncertainty			
Category	ISO	IVE	
Accuracy	1.0%	1.0%	
Depth	0.1%	2.0%	
Velocity	0.4%	1.4%	
Width	0.1%	0.1%	
Method	1.4%		
# Stations	1.4%		
Overall	2.3%	2.6%	

Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview
No changes were made to this file
Quality control warnings

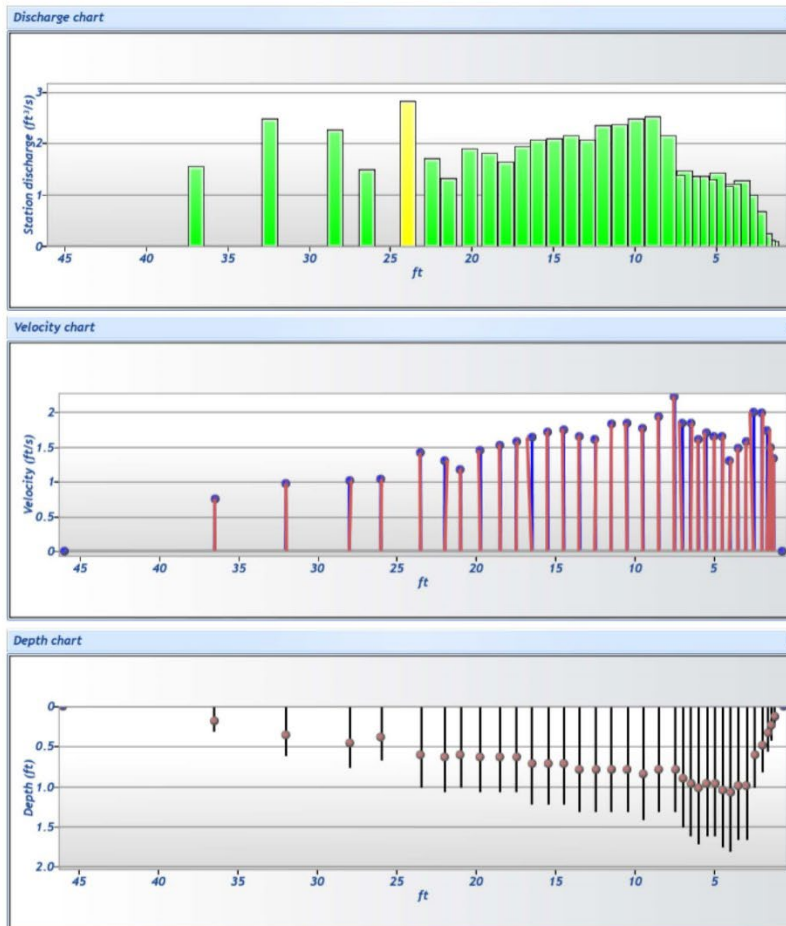
3/19/2026 10:03:13 AM



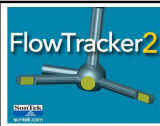
Discharge Measurement Summary

Site name 1139.14.03.03-TMCK02
Site number
Operator(s)
File name 1139_14_03_03-TMCK02_20240620-171340.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



3/19/2026 10:03:13 AM

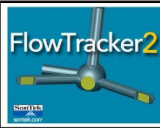


Discharge Measurement Summary

Site name 1139.14.03.03-TMCK02
Site number
Operator(s)
File name 1139_14_03_03-TMCK02_20240620-171340.ft
Comment

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft ²)	Flow (ft ³ /s)	%Q	
0	4:13 PM	0.700	None	0.000	0.0000	0.000	0	0.0000	1.0000	1.3402	0.0000	0.0000	0.00	✓
1	4:13 PM	1.250	0.6	0.200	0.6000	0.120	80	1.3402	1.0000	1.3402	0.0750	0.1005	0.18	✓
2	4:16 PM	1.450	0.6	0.400	0.6000	0.240	80	1.4929	1.0000	1.4929	0.0800	0.1194	0.21	✓
3	4:18 PM	1.650	0.6	0.550	0.6000	0.330	80	1.7356	1.0000	1.7356	0.1513	0.2625	0.47	✓
4	4:19 PM	2.000	0.6	0.800	0.6000	0.480	80	1.9863	1.0000	1.9863	0.3400	0.6754	1.21	✓
5	4:21 PM	2.500	0.6	1.000	0.6000	0.600	80	1.9987	1.0000	1.9987	0.5000	0.9994	1.80	✓
6	4:24 PM	3.000	0.6	1.650	0.6000	0.990	80	1.5707	1.0000	1.5707	0.8250	1.2958	2.33	✓
7	4:26 PM	3.500	0.6	1.650	0.6000	0.990	80	1.4803	1.0000	1.4803	0.8250	1.2213	2.20	✓
8	4:27 PM	4.000	0.6	1.800	0.6000	1.080	80	1.3022	1.0000	1.3022	0.9000	1.1719	2.11	✓
9	4:29 PM	4.500	0.6	1.750	0.6000	1.050	80	1.6513	1.0000	1.6513	0.8750	1.4449	2.60	✓
10	4:30 PM	5.000	0.6	1.600	0.6000	0.960	80	1.6476	1.0000	1.6476	0.8000	1.3181	2.37	✓
11	4:32 PM	5.500	0.6	1.600	0.6000	0.960	80	1.7108	1.0000	1.7108	0.8000	1.3686	2.46	✓
12	4:33 PM	6.000	0.6	1.700	0.6000	1.020	80	1.6057	1.0000	1.6057	0.8500	1.3649	2.45	✓
13	4:35 PM	6.500	0.6	1.600	0.6000	0.960	80	1.8424	1.0000	1.8424	0.8000	1.4739	2.65	✓
14	4:36 PM	7.000	0.6	1.500	0.6000	0.900	80	1.8501	1.0000	1.8501	0.7500	1.3875	2.49	✓
15	4:38 PM	7.500	0.6	1.300	0.6000	0.780	80	2.2222	1.0000	2.2222	0.9750	2.1667	3.90	✓
16	4:40 PM	8.500	0.6	1.300	0.6000	0.780	80	1.9484	1.0000	1.9484	1.3000	2.5330	4.55	✓
17	4:41 PM	9.500	0.6	1.400	0.6000	0.840	80	1.7702	1.0000	1.7702	1.4000	2.4783	4.46	✓
18	4:42 PM	10.500	0.6	1.300	0.6000	0.780	80	1.8389	1.0000	1.8389	1.3000	2.3906	4.30	✓
19	4:44 PM	11.500	0.6	1.300	0.6000	0.780	80	1.8230	1.0000	1.8230	1.3000	2.3699	4.26	✓
20	4:45 PM	12.500	0.6	1.300	0.6000	0.780	80	1.6064	1.0000	1.6064	1.3000	2.0883	3.75	✓
21	4:46 PM	13.500	0.6	1.300	0.6000	0.780	80	1.6617	1.0000	1.6617	1.3000	2.1602	3.88	✓
22	4:47 PM	14.500	0.6	1.200	0.6000	0.720	80	1.7567	1.0000	1.7567	1.2000	2.1080	3.79	✓
23	4:48 PM	15.500	0.6	1.200	0.6000	0.720	80	1.7259	1.0000	1.7259	1.2000	2.0710	3.72	✓
24	4:50 PM	16.500	0.6	1.200	0.6000	0.720	80	1.6315	1.0000	1.6315	1.2000	1.9578	3.52	✓
25	4:51 PM	17.500	0.6	1.050	0.6000	0.630	80	1.5706	1.0000	1.5706	1.0500	1.6492	2.96	✓
26	4:53 PM	18.500	0.6	1.050	0.6000	0.630	80	1.5354	1.0000	1.5354	1.1813	1.8136	3.26	✓
27	4:54 PM	19.750	0.6	1.050	0.6000	0.630	80	1.4488	1.0000	1.4488	1.3125	1.9015	3.42	✓
28	4:56 PM	21.000	0.6	1.000	0.6000	0.600	80	1.1800	1.0000	1.1800	1.1250	1.3275	2.39	✓
29	5:11 PM	22.000	0.6	1.050	0.6000	0.630	80	1.3123	1.0000	1.3123	1.3125	1.7224	3.10	✓
30	4:57 PM	23.500	0.6	1.000	0.6000	0.600	80	1.4120	1.0000	1.4120	2.0000	2.8240	5.08	✓
31	5:09 PM	26.000	0.6	0.650	0.6000	0.390	80	1.0325	1.0000	1.0325	1.4625	1.5100	2.71	✓
32	5:07 PM	28.000	0.6	0.750	0.6000	0.450	80	1.0148	1.0000	1.0148	2.2500	2.2834	4.11	✓
33	4:59 PM	32.000	0.6	0.600	0.6000	0.360	80	0.9748	1.0000	0.9748	2.5500	2.4858	4.47	✓
34	5:02 PM	36.500	0.6	0.300	0.6000	0.180	80	0.7506	1.0000	0.7506	2.1000	1.5763	2.83	✓
35	5:06 PM	46.000	None	0.000	0.0000	0.000	0	0.0000		0.7506	0.0000	0.0000	0.00	✓

3/19/2026 10:03:13 AM



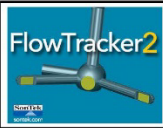
Discharge Measurement Summary

Site name 1139.14.03.03-TMCK02
Site number
Operator(s)
File name 1139_14_03_03-TMCK02_20240620-171340.ft
Comment

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	15.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings							
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
3	4:18 PM	1.650	0.6	0.550	0.6000	0.330	Stn Spacing > QC
6	4:24 PM	3.000	0.6	1.650	0.6000	0.990	Standard Error > QC
7	4:26 PM	3.500	0.6	1.650	0.6000	0.990	Standard Error > QC
8	4:27 PM	4.000	0.6	1.800	0.6000	1.080	Standard Error > QC
10	4:30 PM	5.000	0.6	1.600	0.6000	0.960	Standard Error > QC
11	4:32 PM	5.500	0.6	1.600	0.6000	0.960	Standard Error > QC
12	4:33 PM	6.000	0.6	1.700	0.6000	1.020	Standard Error > QC
13	4:35 PM	6.500	0.6	1.600	0.6000	0.960	Standard Error > QC
14	4:36 PM	7.000	0.6	1.500	0.6000	0.900	Standard Error > QC
17	4:41 PM	9.500	0.6	1.400	0.6000	0.840	Standard Error > QC
20	4:45 PM	12.500	0.6	1.300	0.6000	0.780	Standard Error > QC
21	4:46 PM	13.500	0.6	1.300	0.6000	0.780	Standard Error > QC
22	4:47 PM	14.500	0.6	1.200	0.6000	0.720	Standard Error > QC
24	4:50 PM	16.500	0.6	1.200	0.6000	0.720	Standard Error > QC
28	4:56 PM	21.000	0.6	1.000	0.6000	0.600	Standard Error > QC
31	5:09 PM	26.000	0.6	0.650	0.6000	0.390	Standard Error > QC
35	5:06 PM	46.000	None	0.000	0.0000	0.000	Stn Spacing > QC

3/19/2026 10:03:13 AM

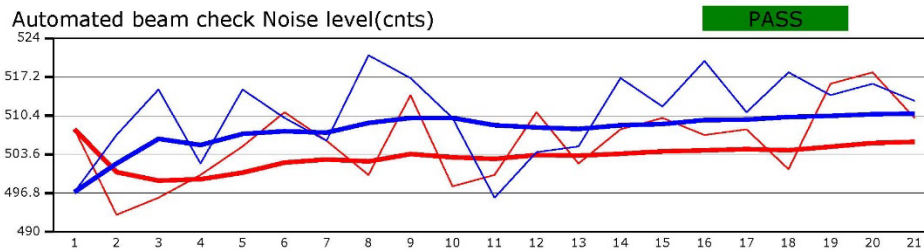
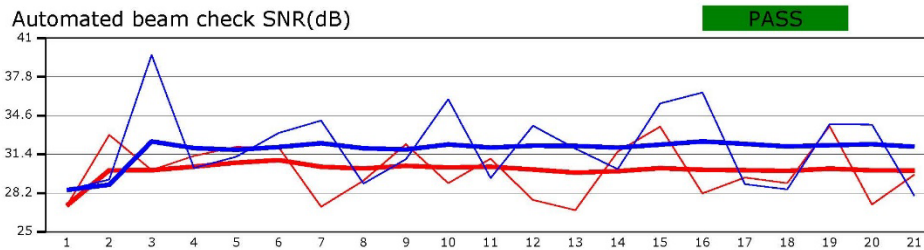


Discharge Measurement Summary

Site name 1139.14.03.03-TMCK02
Site number
Operator(s)
File name 1139_14_03_03-TMCK02_20240620-171340.ft
Comment

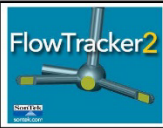
Beam 1	
Beam 2	

Automated beam check Start time 6/20/2024 4:12:52 PM



Automated beam check Quality control warnings
 No quality control warnings

3/19/2026 10:03:13 AM

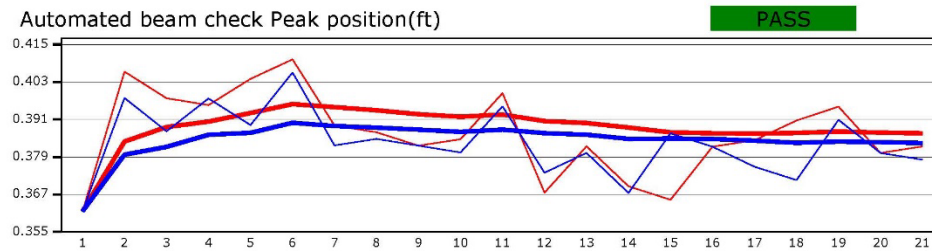
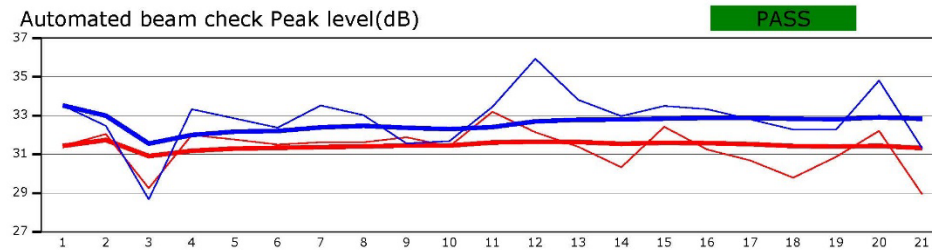


Discharge Measurement Summary

Site name 1139.14.03.03-TMCK02
Site number
Operator(s)
File name 1139_14_03_03-TMCK02_20240620-171340.ft
Comment

Beam 1	
Beam 2	

Automated beam check Start time 6/20/2024 4:12:52 PM



Automated beam check Quality control warnings
 No quality control warnings

3/19/2026 10:03:13 AM

QRev Discharge Summary Note

Station Name: TMCK02

Site ID:

Total Q (ft³/s): 236.016

Date: 05/09/2025

Estimated Uncertainty (%): 4.7



Transect Discharge

File Name	Start Time	End Time	Start Edge	Top Q (ft ³ /s)	Middle Q (ft ³ /s)	Bottom Q (ft ³ /s)	Total Q (ft ³ /s)
02-Transsect_20250509095753.mat	9:59:54	10:03:53	Right	57.351	127.843	28.794	231.876
03-Transsect_20250509100355.mat	10:04:04	10:07:38	Left	57.984	141.969	26.348	240.126
04-Transsect_20250509100740.mat	10:11:41	10:15:17	Right	61.986	130.306	28.8	234.648
05-Transsect_20250509101519.mat	10:15:28	10:19:19	Left	60.545	135.483	28.136	237.784
06-Transsect_20250509102019.mat	10:20:34	10:24:14	Right	60.224	125.491	28.379	226.758
07-Transsect_20250509102416.mat	10:24:26	10:28:29	Left	62.916	140.549	28.309	244.902
Mean	-	-	-	60.167	133.607	28.127	236.016

Measurement Details

Mean Measurement Depth (ft): 1.145

Maximum Measurement Depth (ft): 2.093

Total Measurement Duration (s): 1363.00

File Name	Mean Temp (°C)	Width (ft)	Area (ft ²)	Mean Boat Speed (ft/s)	Mean V (ft/s)	Invalid Depth Cells (%)	Invalid Ens (%)
02-Transsect_20250509095753.mat	17.5	86.084	102.245	0.465	2.268	30.8	45.8
03-Transsect_20250509100355.mat	17.6	87.173	100.166	0.345	2.397	13.5	27.4
04-Transsect_20250509100740.mat	17.7	90.518	103.203	0.348	2.274	16.7	23.5
05-Transsect_20250509101519.mat	17.8	90.216	102.457	0.279	2.321	8.1	12.1
06-Transsect_20250509102019.mat	17.9	89.523	101.581	0.356	2.232	22.8	27.6
07-Transsect_20250509102416.mat	18	93.035	104.561	0.299	2.342	10.2	19.3
Mean	17.8	89.425	102.369	0.349	2.306	17	26

Edges

File Name	Left Edge Type	Right Edge Type	Left Edge Distance (ft)	Right Edge Distance (ft)	Left Q (ft ³ /s)	Right Q (ft ³ /s)
02-Transsect_20250509095753.mat	Triangular	User Q	30	2	16.058	1.83
03-Transsect_20250509100355.mat	Triangular	User Q	30	2	11.996	1.83
04-Transsect_20250509100740.mat	Triangular	User Q	30	2	11.726	1.83
05-Transsect_20250509101519.mat	Triangular	User Q	30	2	11.791	1.83
06-Transsect_20250509102019.mat	Triangular	User Q	30	2	10.835	1.83
07-Transsect_20250509102416.mat	Triangular	User Q	30	2	11.299	1.83
Mean	-	-	30	2	12.284	1.83

Processing

Software:QRev 4.38
Navigation Reference:BT
Composite Tracks:Off
Magnetic Variation:13.40
Salinity:0.0
Depth Reference:BT
Extrapolation Method (Top/Bottom Exponent):
Power / Power Exp: 0.1752

Instrument Details

Model:RS5
Frequency:Multi
Serial Number:RS52441001
Firmware Version:1.51
Instrument Configuration:

Quality Assurance

Diagnostic Test Results:Pass
Compass Calibration Results:Yes
Moving Bed Test Type:Stationary
Moving Bed Condition:No

User Comments

QRev Messages

Edges: Edge Q is greater than 5%;bt-Int. Q for consecutive invalid ensembles exceeds 3.0%;Compass: One or more transects have a change in mag field exceeding 2%;Edges: Excessive boat movement in edge ensembles;Edges: The percent of invalid ensembles exceeds 25% in one or more transects.Temperature: No independent temperature reading;Site Info: Station number not entered;wt-Int. Q for consecutive invalid ensembles
QRev Summary File: 20250602_095430_438_QRev

Discharge Measurement Summary

Site name	TMCK02
Site number	2
Operator(s)	DM
File name	TMCK02_20250821-124110.ft
Comment	

Start time	8/21/2025 10:33 AM	Sensor type	Top Setting
End time	8/21/2025 12:25 PM	Handheld serial number	FT2H2126012
Start location latitude	39.919	Probe serial number	FT2P2127007
Start location longitude	-122.429	Probe firmware	1.30
Calculations engine	FlowTracker2	Handheld software	2.0

# Stations	Avg interval (s)	Total discharge (ft³/s)
57	40	5.9025

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
86.100	65.0600	86.365

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
20	0.756	0.0907

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
81.759	1.650	0.1994

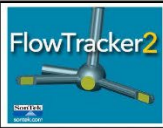
Discharge Uncertainty		
Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.1%	1.4%
Velocity	0.2%	2.1%
Width	0.1%	0.1%
Method	1.0%	
# Stations	0.9%	
Overall	1.7%	2.7%

Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview
No changes were made to this file
Quality control warnings

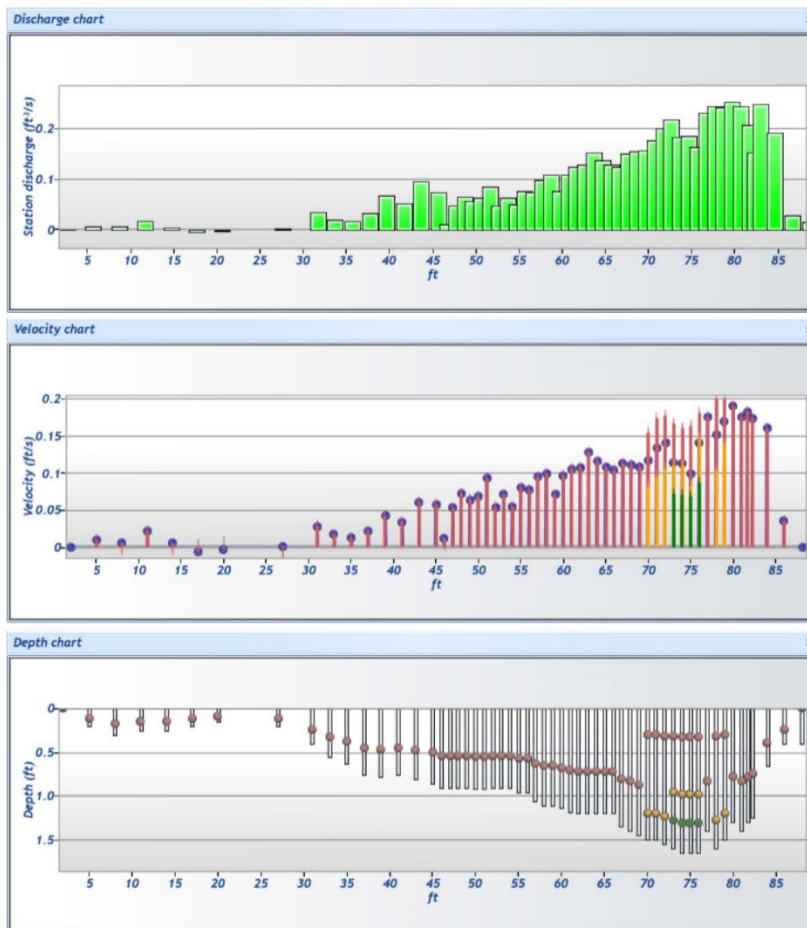
8/25/2025 9:45:57 AM



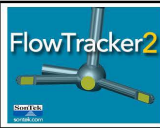
Discharge Measurement Summary

Site name TMCK02
Site number 2
Operator(s) DM
File name TMCK02_20250821-124110.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



8/25/2025 9:45:57 AM



Discharge Measurement Summary

Site name TMCK02
Site number 2
Operator(s) DM
File name TMCK02_20250821-124110.ft
Comment

Measurement results													
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Corrected	Mean Velocity (ft/s)	Area (ft ²)	Flow (ft ³ /s)	%Q
0	10:33 AM	2.000	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.0099	0.0000	0.0000	0.00 ✓
1	10:35 AM	5.000	0.6	0.200	0.6000	0.120	80	0.0099	1.0000	0.0099	0.6000	0.0059	0.10 ✓
2	10:37 AM	8.000	0.6	0.300	0.6000	0.180	80	0.0064	1.0000	0.0064	0.9000	0.0057	0.10 ✓
3	10:40 AM	11.000	0.6	0.250	0.6000	0.150	80	0.0222	1.0000	0.0222	0.7500	0.0166	0.28 ✓
4	10:41 AM	14.000	0.6	0.250	0.6000	0.150	80	0.0056	1.0000	0.0056	0.7500	0.0042	0.07 ✓
5	10:42 AM	17.000	0.6	0.200	0.6000	0.120	80	-0.0064	1.0000	-0.0064	0.6000	-0.0039	-0.07 ✓
6	10:44 AM	20.000	0.6	0.150	0.6000	0.090	80	-0.0033	1.0000	-0.0033	0.7500	-0.0025	-0.04 ✓
7	10:45 AM	22.000	0.6	0.200	0.6000	0.120	80	0.0017	1.0000	0.0017	1.1000	0.0019	0.03 ✓
8	10:48 AM	31.000	0.6	0.400	0.6000	0.240	80	0.0286	1.0000	0.0286	1.2000	0.0343	0.58 ✓
9	10:50 AM	33.000	0.6	0.550	0.6000	0.330	80	0.0175	1.0000	0.0175	1.1000	0.0193	0.33 ✓
10	10:52 AM	35.000	0.6	0.630	0.6000	0.378	80	0.0130	1.0000	0.0130	1.2600	0.0163	0.28 ✓
11	10:53 AM	37.000	0.6	0.750	0.6000	0.450	80	0.0215	1.0000	0.0215	1.5000	0.0323	0.55 ✓
12	10:56 AM	39.000	0.6	0.780	0.6000	0.468	80	0.0431	1.0000	0.0431	1.5600	0.0673	1.14 ✓
13	10:58 AM	41.000	0.6	0.750	0.6000	0.450	80	0.0344	1.0000	0.0344	1.5000	0.0516	0.87 ✓
14	10:59 AM	43.000	0.6	0.800	0.6000	0.480	80	0.0601	1.0000	0.0601	1.6000	0.0961	1.63 ✓
15	11:01 AM	45.000	0.6	0.850	0.6000	0.510	80	0.0524	1.0000	0.0524	1.2750	0.0732	1.24 ✓
16	11:02 AM	46.000	0.6	0.900	0.6000	0.540	80	0.0124	1.0000	0.0124	0.9000	0.0111	0.19 ✓
17	11:04 AM	47.000	0.6	0.900	0.6000	0.540	80	0.0526	1.0000	0.0526	0.9000	0.0473	0.80 ✓
18	11:05 AM	48.000	0.6	0.900	0.6000	0.540	80	0.0719	1.0000	0.0719	0.9000	0.0647	1.10 ✓
19	11:06 AM	49.000	0.6	0.900	0.6000	0.540	80	0.0641	1.0000	0.0641	0.9000	0.0576	0.98 ✓
20	11:08 AM	50.000	0.6	0.920	0.6000	0.552	80	0.0687	1.0000	0.0687	0.9200	0.0632	1.07 ✓
21	11:09 AM	51.000	0.6	0.920	0.6000	0.552	80	0.0925	1.0000	0.0925	0.9200	0.0851	1.44 ✓
22	11:10 AM	52.000	0.6	0.900	0.6000	0.540	80	0.0539	1.0000	0.0539	0.9000	0.0485	0.82 ✓
23	11:12 AM	53.000	0.6	0.900	0.6000	0.540	80	0.0705	1.0000	0.0705	0.9000	0.0635	1.08 ✓
24	11:13 AM	54.000	0.6	0.900	0.6000	0.540	80	0.0548	1.0000	0.0548	0.9000	0.0493	0.83 ✓
25	11:14 AM	55.000	0.6	0.950	0.6000	0.570	80	0.0797	1.0000	0.0797	0.9500	0.0757	1.28 ✓
26	11:16 AM	56.000	0.6	0.950	0.6000	0.570	80	0.0771	1.0000	0.0771	0.9500	0.0732	1.24 ✓
27	11:17 AM	57.000	0.6	1.050	0.6000	0.630	80	0.0945	1.0000	0.0945	1.0500	0.0992	1.68 ✓
28	11:20 AM	58.000	0.6	1.100	0.6000	0.660	80	0.0990	1.0000	0.0990	1.1000	0.1089	1.84 ✓
29	11:22 AM	60.000	0.6	1.100	0.6000	0.660	80	0.0702	1.0000	0.0702	1.1000	0.0773	1.31 ✓
30	11:25 AM	60.000	0.6	1.130	0.6000	0.678	80	0.0967	1.0000	0.0967	1.1300	0.1093	1.85 ✓
31	11:26 AM	61.000	0.6	1.180	0.6000	0.708	80	0.1056	1.0000	0.1056	1.1800	0.1246	2.11 ✓
32	11:28 AM	62.000	0.6	1.200	0.6000	0.720	80	0.1070	1.0000	0.1070	1.2000	0.1285	2.18 ✓
33	11:30 AM	63.000	0.6	1.200	0.6000	0.720	80	0.1271	1.0000	0.1271	1.2000	0.1525	2.58 ✓
34	11:31 AM	64.000	0.6	1.200	0.6000	0.720	80	0.1147	1.0000	0.1147	1.2000	0.1376	2.33 ✓
35	11:33 AM	65.000	0.6	1.200	0.6000	0.720	80	0.1075	1.0000	0.1075	1.2000	0.1290	2.19 ✓
36	11:34 AM	66.000	0.6	1.200	0.6000	0.720	80	0.1037	1.0000	0.1037	1.2000	0.1245	2.11 ✓
37	11:35 AM	67.000	0.6	1.350	0.6000	0.810	80	0.1123	1.0000	0.1123	1.3500	0.1519	2.57 ✓
38	11:37 AM	68.000	0.6	1.400	0.6000	0.840	80	0.1108	1.0000	0.1108	1.4000	0.1551	2.63 ✓
39	11:39 AM	69.000	0.6	1.450	0.6000	0.870	80	0.1080	1.0000	0.1080	1.4500	0.1566	2.65 ✓
40	11:40 AM	70.000	0.2/0.8	1.500	0.2000	0.300	80	0.1540	1.0000	0.1173	1.5000	0.1759	2.98 ✓
40	11:40 AM	70.000	0.2/0.8	1.500	0.8000	1.200	80	0.0806	1.0000	0.1173	1.5000	0.1759	2.98 ✓
41	11:47 AM	71.000	0.2/0.8	1.500	0.2000	0.300	80	0.1732	1.0000	0.1338	1.5000	0.2007	3.40 ✓
41	11:47 AM	71.000	0.2/0.8	1.500	0.8000	1.200	80	0.0943	1.0000	0.1338	1.5000	0.2007	3.40 ✓
42	11:49 AM	72.000	0.2/0.8	1.550	0.2000	0.310	80	0.1763	1.0000	0.1407	1.5500	0.2181	3.70 ✓
42	11:49 AM	72.000	0.2/0.8	1.550	0.8000	1.240	80	0.1051	1.0000	0.1407	1.5500	0.2181	3.70 ✓
43	11:52 AM	73.000	0.2/0.6/0.8	1.600	0.2000	0.320	80	0.1657	1.0000	0.1145	1.6000	0.1832	3.10 ✓
43	11:52 AM	73.000	0.2/0.6/0.8	1.600	0.6000	0.960	80	0.1102	1.0000	0.1145	1.6000	0.1832	3.10 ✓
43	11:52 AM	73.000	0.2/0.6/0.8	1.600	0.8000	1.280	80	0.0720	1.0000	0.1145	1.6000	0.1832	3.10 ✓
44	11:55 AM	74.000	0.2/0.6/0.8	1.650	0.2000	0.330	80	0.1596	1.0000	0.1123	1.6500	0.1853	3.14 ✓
44	11:55 AM	74.000	0.2/0.6/0.8	1.650	0.6000	0.990	80	0.1099	1.0000	0.1123	1.6500	0.1853	3.14 ✓
44	11:55 AM	74.000	0.2/0.6/0.8	1.650	0.8000	1.320	80	0.0700	1.0000	0.1123	1.6500	0.1853	3.14 ✓
45	11:59 AM	75.000	0.2/0.6/0.8	1.650	0.2000	0.330	80	0.1627	1.0000	0.0990	1.6500	0.1634	2.77 ✓
45	11:59 AM	75.000	0.2/0.6/0.8	1.650	0.6000	0.990	80	0.0823	1.0000	0.0990	1.6500	0.1634	2.77 ✓
45	11:59 AM	75.000	0.2/0.6/0.8	1.650	0.8000	1.320	80	0.0667	1.0000	0.0990	1.6500	0.1634	2.77 ✓
46	12:02 PM	76.000	0.2/0.6/0.8	1.650	0.2000	0.330	80	0.1802	1.0000	0.1405	1.6500	0.2318	3.93 ✓
46	12:02 PM	76.000	0.2/0.6/0.8	1.650	0.6000	0.990	80	0.1476	1.0000	0.1405	1.6500	0.2318	3.93 ✓
46	12:02 PM	76.000	0.2/0.6/0.8	1.650	0.8000	1.320	80	0.0866	1.0000	0.1405	1.6500	0.2318	3.93 ✓
47	12:06 PM	77.000	0.6	1.400	0.6000	0.840	80	0.1746	1.0000	0.1746	1.4000	0.2445	4.14 ✓
48	12:08 PM	78.000	0.2/0.8	1.600	0.2000	0.320	80	0.1994	1.0000	0.1513	1.6000	0.2421	4.10 ✓
48	12:08 PM	78.000	0.2/0.8	1.600	0.8000	1.280	80	0.1032	1.0000	0.1513	1.6000	0.2421	4.10 ✓
49	12:11 PM	79.000	0.2/0.8	1.500	0.2000	0.300	80	0.1992	1.0000	0.1693	1.5000	0.2540	4.30 ✓
49	12:11 PM	79.000	0.2/0.8	1.500	0.8000	1.200	80	0.1394	1.0000	0.1693	1.5000	0.2540	4.30 ✓
50	12:14 PM	80.000	0.6	1.300	0.6000	0.780	80	0.1890	1.0000	0.1890	1.3000	0.2457	4.16 ✓
51	12:15 PM	81.000	0.6	1.400	0.6000	0.840	80	0.1747	1.0000	0.1747	1.1900	0.2079	3.52 ✓
52	12:25 PM	81.700	0.6	1.300	0.6000	0.780	80	0.1820	1.0000	0.1820	0.8450	0.1538	2.61 ✓
53	12:17 PM	82.300	0.6	1.250	0.6000	0.750	80	0.1726	1.0000	0.1726	1.4375	0.2482	4.20 ✓
54	12:20 PM	84.000	0.6	0.450	0.6000	0.270	80	0.1593	1.0000	0.1593	1.2025	0.1916	3.25 ✓
55	12:21 PM	86.000	0.6	0.400	0.6000	0.240	80	0.0354	1.0000	0.0354	0.8200	0.0291	0.49 ✓
56	12:23 PM	88.100	None	0.400	0.0000	0.000	0	0.0000	1.0000	0.0354	0.4200	0.0149	0.25 ✓

8/25/2025 9:45:57 AM



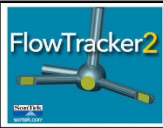
Discharge Measurement Summary

Site name TMCK02
Site number 2
Operator(s) DM
File name TMCK02_20250821-124110.ft
Comment

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	15.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings							
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	10:35 AM	5.000	0.6	0.200	0.6000	0.120	SNR Threshold Variation
2	10:37 AM	8.000	0.6	0.300	0.6000	0.180	Large SNR Variation, SNR Threshold Variation
4	10:41 AM	14.000	0.6	0.250	0.6000	0.150	Boundary Interference, Large SNR Variation, SNR Threshold Variation
5	10:42 AM	17.000	0.6	0.200	0.6000	0.120	Large SNR Variation, SNR Threshold Variation
6	10:44 AM	20.000	0.6	0.150	0.6000	0.090	Boundary Interference, Large SNR Variation, SNR Threshold Variation
7	10:45 AM	27.000	0.6	0.200	0.6000	0.120	Boundary Interference
8	10:48 AM	31.000	0.6	0.400	0.6000	0.240	Large SNR Variation
9	10:50 AM	33.000	0.6	0.550	0.6000	0.330	Large SNR Variation
16	11:02 AM	46.000	0.6	0.900	0.6000	0.540	Large SNR Variation
17	11:04 AM	47.000	0.6	0.900	0.6000	0.540	Large SNR Variation
19	11:06 AM	49.000	0.6	0.900	0.6000	0.540	Large SNR Variation
20	11:08 AM	50.000	0.6	0.920	0.6000	0.552	Large SNR Variation
22	11:10 AM	52.000	0.6	0.900	0.6000	0.540	Boundary Interference
23	11:12 AM	53.000	0.6	0.900	0.6000	0.540	Boundary Interference
24	11:13 AM	54.000	0.6	0.900	0.6000	0.540	Large SNR Variation
36	11:34 AM	66.000	0.6	1.200	0.6000	0.720	Boundary Interference
38	11:37 AM	68.000	0.6	1.400	0.6000	0.840	Large SNR Variation
40	11:40 AM	70.000	0.2/0.8	1.500	0.2000	0.300	Large SNR Variation
40	11:40 AM	70.000	0.2/0.8	1.500	0.8000	1.200	Large SNR Variation
45	11:59 AM	75.000	0.2/0.6/0.8	1.650	0.2000	0.330	Boundary Interference, Large SNR Variation
45	11:59 AM	75.000	0.2/0.6/0.8	1.650	0.6000	0.990	Boundary Interference, Large SNR Variation
45	11:59 AM	75.000	0.2/0.6/0.8	1.650	0.8000	1.320	Boundary Interference, Large SNR Variation
55	12:21 PM	86.000	0.6	0.400	0.6000	0.240	Large SNR Variation, SNR Threshold Variation

8/25/2025 9:45:57 AM

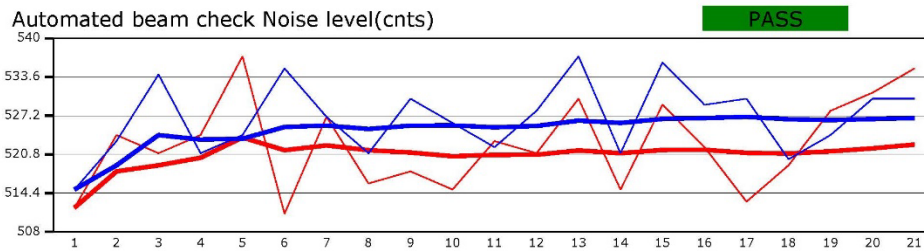
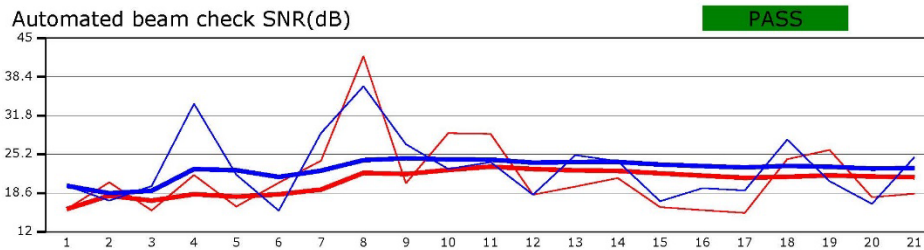


Discharge Measurement Summary

Site name TMCK02
Site number 2
Operator(s) DM
File name TMCK02_20250821-124110.ft
Comment

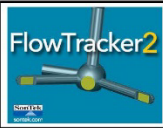
Beam 1	
Beam 2	

Automated beam check Start time 8/21/2025 10:31:55 AM



Automated beam check Quality control warnings
 No quality control warnings

8/25/2025 9:45:57 AM

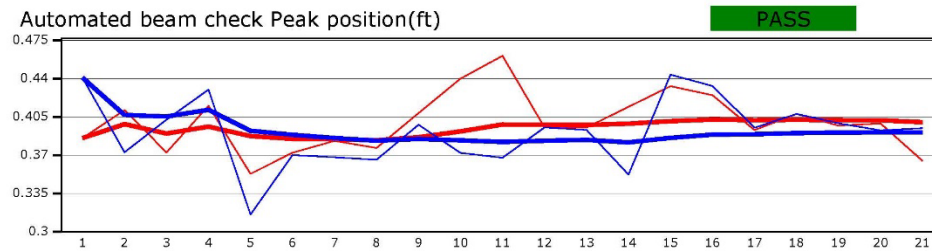
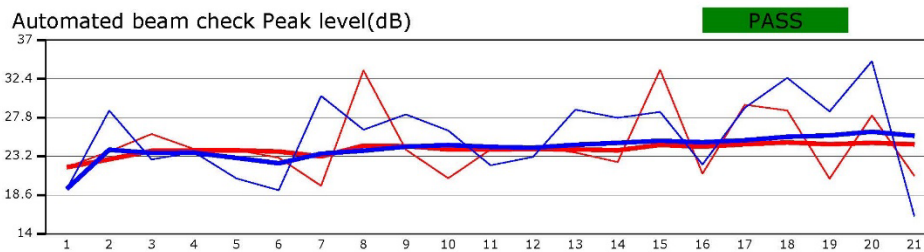


Discharge Measurement Summary

Site name TMCK02
Site number 2
Operator(s) DM
File name TMCK02_20250821-124110.ft
Comment

Beam 1	
Beam 2	

Automated beam check Start time 8/21/2025 10:31:55 AM



Automated beam check Quality control warnings
 No quality control warnings

8/25/2025 9:45:57 AM

6.1.2.3 TMCK04

QRev Discharge Summary Note

Station Name: TMCK05

Site ID:

Total Q (ft³ / s): 235.179

Date: 05/09/2025

Estimated Uncertainty (%): 5.5

Transect Discharge

File Name	Start Time	End Time	Start Edge	Top Q (ft ³ / s)	Middle Q (ft ³ / s)	Bottom Q (ft ³ / s)	Total Q (ft ³ / s)
02-Transect_20250509160036.mat	16:01:06	16:05:07	Left	71.545	114.426	29.469	227.541
03-Transect_20250509160509.mat	16:05:17	16:08:24	Right	71.746	123.931	30.017	236.84
04-Transect_20250509160827.mat	16:08:56	16:12:45	Left	72.905	122.326	28.578	234.795
05-Transect_20250509161247.mat	16:12:54	16:16:32	Right	76.475	122.326	30.408	241.541
Mean	-	-	-	73.168	120.752	29.618	235.179

Measurement Details

Mean Measurement Depth (ft): 1.212

Maximum Measurement Depth (ft): 1.846

Total Measurement Duration (s): 875.00

File Name	Mean Temp (°C)	Width (ft)	Area (ft ²)	Mean Boat Speed (ft/s)	Mean V (ft/s)	Invalid Depth Cells (%)	Invalid Ens (%)
02-Transect_20250509160036.mat	25	82.083	97.416	0.429	2.336	5.4	10.7
03-Transect_20250509160509.mat	24.9	85.164	105.069	0.429	2.254	3.4	4.3
04-Transect_20250509160827.mat	24.9	86.941	105.727	0.387	2.221	5.6	10
05-Transect_20250509161247.mat	24.9	87.318	105.744	0.367	2.284	4.7	3.7
Mean	24.9	85.377	103.489	0.403	2.274	4.8	7.2

Edges

File Name	Left Edge Type	Right Edge Type	Left Edge Distance (ft)	Right Edge Distance (ft)	Left Q (ft ³ / s)	Right Q (ft ³ / s)
02-Transect_20250509160036.mat	Triangular	Triangular	8	8	4.665	7.436
03-Transect_20250509160509.mat	Triangular	Triangular	8	8	4.306	6.84
04-Transect_20250509160827.mat	Triangular	Triangular	8	8	4.417	6.568
05-Transect_20250509161247.mat	Triangular	Triangular	8	8	4.374	7.957
Mean	-	-	8	8	4.44	7.2

Processing

Software:QRev 4.38
Navigation Reference:BT
Composite Tracks:Off
Magnetic Variation:13.40
Salinity:0.0
Depth Reference:BT
Extrapolation Method
(Top/Bottom Exponent):
Power / Power Exp: 0.1954

Instrument Details

Model:RS5
Frequency:Multi
Serial Number:RS52441001
Firmware Version:1.51
Instrument Configuration:

Quality Assurance

Diagnostic Test Results:Pass
Compass Calibration Results:Yes
Moving Bed Test Type:Stationary
Moving Bed Condition:No

User Comments

QRev Messages

Compass: One or more transects have a change in mag field exceeding 2%;Edges: Excessive boat movement in edge ensembles;Temperature: No independent temperature reading;Site Info: Station number not entered;Edges: User modified left edge distance.
QRev Summary File: 20250602_101135_438_QRev



6.1.2.4 TMCK05

	Discharge Measurement Summary
---	---

Site name	1139.14.03.03_TMCK05	
Site number		
Operator(s)	DM	
File name	1139_14_03_03_TMCK05_20240620-124251.ft	
Comment		

Start time	6/20/2024 11:25 AM	Sensor type	Top Setting
End time	6/20/2024 12:27 PM	Handheld serial number	FT2H2126012
Start location latitude	39.977	Probe serial number	FT2P2127007
Start location longitude	-122.225	Probe firmware	1.30
Calculations engine	FlowTracker2	Handheld software	1.7

# Stations	Avg interval (s)	Total discharge (ft³/s)
31	40	35.5362

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
25.900	34.4688	27.777

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
32	1.331	1.0310

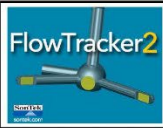
Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
74.139	1.500	1.3608

Discharge Uncertainty			Discharge equation	Mid Section
Category	ISO	IVE	Discharge uncertainty	IVE
Accuracy	1.0%	1.0%	Discharge reference	Rated
Depth	0.1%	1.4%		
Velocity	0.5%	2.0%		
Width	0.1%	0.1%		
Method	1.4%			
# Stations	1.7%			
Overall	2.5%	2.7%		

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview
No changes were made to this file
Quality control warnings

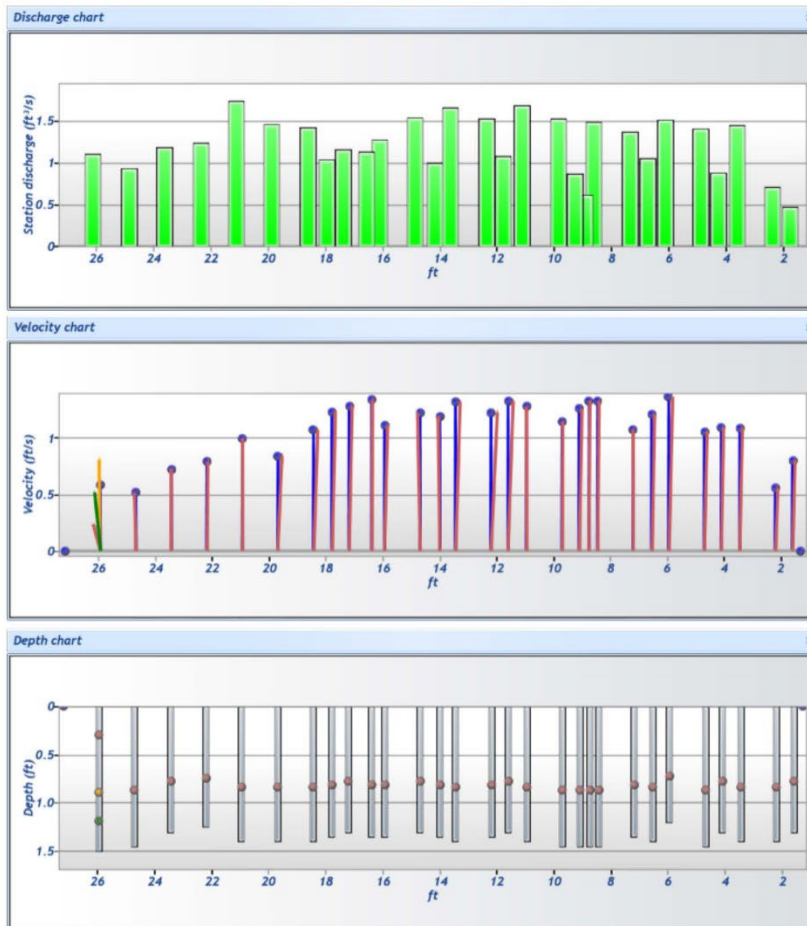
3/19/2026 10:11:12 AM



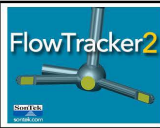
Discharge Measurement Summary

Site name 1139.14.03.03_TMCK05
Site number
Operator(s) DM
File name 1139_14_03_03_TMCK05_20240620-124251.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



3/19/2026 10:11:12 AM



Discharge Measurement Summary

Site name 1139.14.03.03_TMCK05
Site number
Operator(s) DM
File name 1139_14_03_03_TMCK05_20240620-124251.ft
Comment

Measurement results													
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q
30	12:10 PM	1.300	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.8004	0.0000	0.0000	0.00
29	12:08 PM	1.600	0.6	1.300	0.6000	0.780	80	0.8004	1.0000	0.8004	0.5850	0.4682	1.32
28	12:05 PM	2.200	0.6	1.400	0.6000	0.840	80	0.5518	1.0000	0.5518	1.2950	0.7146	2.01
27	12:04 PM	3.450	0.6	1.400	0.6000	0.840	80	1.0850	1.0000	1.0850	1.3300	1.4430	4.06
26	12:11 PM	4.100	0.6	1.300	0.6000	0.780	80	1.0880	1.0000	1.0880	0.8125	0.8840	2.49
25	12:02 PM	4.700	0.6	1.450	0.6000	0.870	80	1.0554	1.0000	1.0554	1.3413	1.4156	3.98
24	12:00 PM	5.950	0.6	1.200	0.6000	0.720	80	1.3608	1.0000	1.3608	1.1100	1.5105	4.25
23	12:14 PM	6.550	0.6	1.400	0.6000	0.840	80	1.2037	1.0000	1.2037	0.8750	1.0532	2.96
22	11:58 AM	7.200	0.6	1.350	0.6000	0.810	80	1.0694	1.0000	1.0694	1.2825	1.3715	3.86
21	11:57 AM	8.450	0.6	1.450	0.6000	0.870	80	1.3210	1.0000	1.3210	1.1238	1.4845	4.18
20	12:17 PM	8.750	0.6	1.450	0.6000	0.870	80	1.3265	1.0000	1.3265	0.4713	0.6251	1.76
19	12:15 PM	9.100	0.6	1.450	0.6000	0.870	80	1.2529	1.0000	1.2529	0.6888	0.8629	2.43
18	11:55 AM	9.700	0.6	1.450	0.6000	0.870	80	1.1397	1.0000	1.1397	1.3413	1.5286	4.30
17	11:54 AM	10.950	0.6	1.400	0.6000	0.840	80	1.2720	1.0000	1.2720	1.3300	1.6917	4.76
16	12:20 PM	11.600	0.6	1.300	0.6000	0.780	80	1.3231	1.0000	1.3231	0.8125	1.0750	3.03
15	11:52 AM	12.200	0.6	1.350	0.6000	0.810	80	1.2214	1.0000	1.2214	1.2488	1.5252	4.29
14	11:51 AM	13.450	0.6	1.400	0.6000	0.840	80	1.3148	1.0000	1.3148	1.2600	1.6567	4.66
13	12:22 PM	14.000	0.6	1.350	0.6000	0.810	80	1.1879	1.0000	1.1879	0.8438	1.0023	2.82
12	11:50 AM	14.700	0.6	1.300	0.6000	0.780	80	1.2186	1.0000	1.2186	1.2675	1.5446	4.35
11	11:48 AM	15.950	0.6	1.350	0.6000	0.810	80	1.1078	1.0000	1.1078	1.1475	1.2712	3.58
10	12:25 PM	16.400	0.6	1.350	0.6000	0.810	80	1.3361	1.0000	1.3361	0.8438	1.1274	3.17
9	11:47 AM	17.200	0.6	1.300	0.6000	0.780	80	1.2796	1.0000	1.2796	0.9100	1.1644	3.28
8	12:27 PM	17.800	0.6	1.350	0.6000	0.810	80	1.2272	1.0000	1.2272	0.8438	1.0355	2.91
7	11:45 AM	18.450	0.6	1.400	0.6000	0.840	80	1.0693	1.0000	1.0693	1.3300	1.4222	4.00
6	11:44 AM	19.700	0.6	1.400	0.6000	0.840	80	0.8381	1.0000	0.8381	1.7500	1.4666	4.13
5	11:42 AM	20.950	0.6	1.400	0.6000	0.840	80	0.9906	1.0000	0.9906	1.7500	1.7336	4.88
4	11:40 AM	22.200	0.6	1.250	0.6000	0.750	80	0.7918	1.0000	0.7918	1.5625	1.2373	3.48
3	11:39 AM	23.450	0.6	1.300	0.6000	0.780	80	0.7260	1.0000	0.7260	1.6250	1.1797	3.32
2	11:37 AM	24.700	0.6	1.450	0.6000	0.870	80	0.5155	1.0000	0.5155	1.8125	0.9344	2.63
1	11:25 AM	25.950	0.2/0.6/0.8	1.500	0.2000	0.300	80	0.2363	1.0000	0.5902	1.8750	1.1066	3.11
1	11:25 AM	25.950	0.2/0.6/0.8	1.500	0.6000	0.900	80	0.8043	1.0000	0.5902	1.8750	1.1066	3.11
1	11:25 AM	25.950	0.2/0.6/0.8	1.500	0.8000	1.200	80	0.5157	1.0000	0.5902	1.8750	1.1066	3.11
0	11:25 AM	27.200	None	0.000	0.0000	0.000	0	0.0000		0.5902	0.0000	0.0000	0.00

3/19/2026 10:11:12 AM



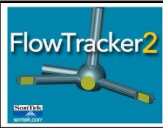
Discharge Measurement Summary

Site name 1139.14.03.03_TMCK05
Site number
Operator(s) DM
File name 1139_14_03_03_TMCK05_20240620-124251.ft
Comment

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	15.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings						
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)
29	12:08 PM	1.600	0.6	1.300	0.6000	0.780
26	12:11 PM	4.100	0.6	1.300	0.6000	0.780
22	11:58 AM	7.200	0.6	1.350	0.6000	0.810
19	12:15 PM	9.100	0.6	1.450	0.6000	0.870
13	12:22 PM	14.000	0.6	1.350	0.6000	0.810
12	11:50 AM	14.700	0.6	1.300	0.6000	0.780
1	11:25 AM	25.950	0.2/0.6/0.8	1.500	0.2000	0.300
1	11:25 AM	25.950	0.2/0.6/0.8	1.500	0.6000	0.900
1	11:25 AM	25.950	0.2/0.6/0.8	1.500	0.8000	1.200
0	11:25 AM	27.200	None	0.000	0.0000	0.000

3/19/2026 10:11:12 AM

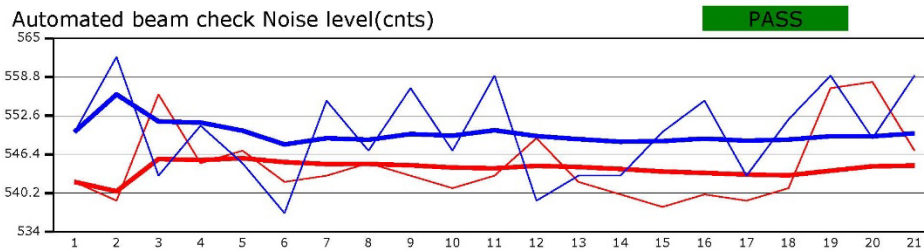
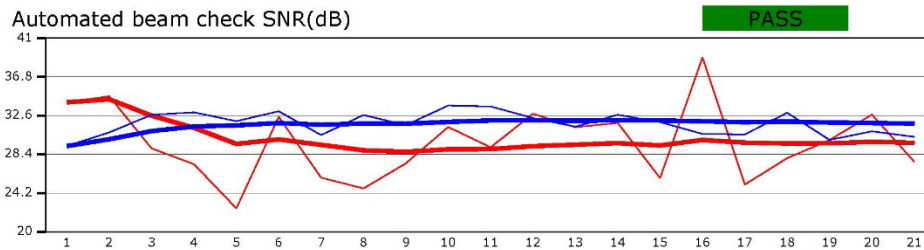


Discharge Measurement Summary

Site name 1139.14.03.03_TMCK05
Site number
Operator(s) DM
File name 1139_14_03_03_TMCK05_20240620-124251.ft
Comment

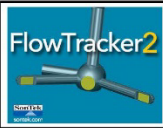
Beam 1	
Beam 2	

Automated beam check Start time 6/20/2024 11:23:42 AM



Automated beam check Quality control warnings
 No quality control warnings

3/19/2026 10:11:12 AM

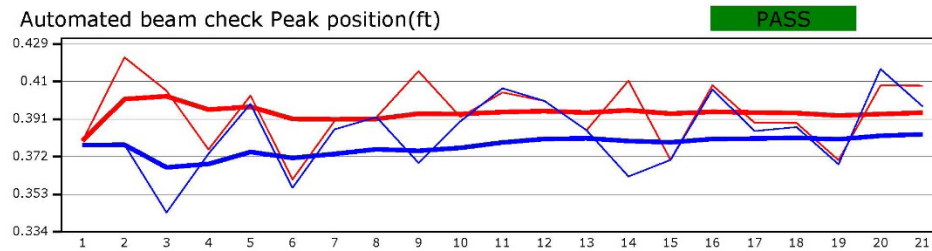
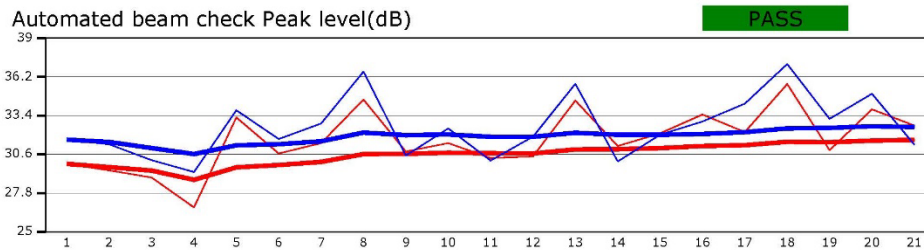


Discharge Measurement Summary

Site name 1139.14.03.03_TMCK05
Site number
Operator(s) DM
File name 1139_14_03_03_TMCK05_20240620-124251.ft
Comment

Beam 1	
Beam 2	

Automated beam check Start time 6/20/2024 11:23:42 AM



Automated beam check Quality control warnings
 No quality control warnings

3/19/2026 10:11:12 AM

QRev Discharge Summary Note

Station Name: TMCK05

Site ID:

Total Q (ft³ / s): 235.396

Date: 05/09/2025

Estimated Uncertainty (%): 5.9



Transect Discharge

File Name	Start Time	End Time	Start Edge	Top Q (ft ³ / s)	Middle Q (ft ³ / s)	Bottom Q (ft ³ / s)	Total Q (ft ³ / s)
02-Transect_20250509143139.mat	14:32:12	14:36:12	Left	67.476	144.173	38.093	251.577
03-Transect_20250509143615.mat	14:36:22	14:40:10	Right	62.582	137.386	35.214	236.637
04-Transect_20250509144012.mat	14:40:19	14:43:42	Left	60.602	129.526	34.251	226.018
05-Transect_20250509144344.mat	14:43:53	14:47:21	Right	65.95	136.096	37.286	240.948
06-Transect_20250509144723.mat	14:47:39	14:50:47	Left	55.825	131.024	31.996	220.439
07-Transect_20250509145050.mat	14:50:56	14:54:23	Right	65.925	132.972	36.076	236.756
Mean	-	-	-	63.06	135.196	35.486	235.396

Measurement Details

Mean Measurement Depth (ft): 1.772

Maximum Measurement Depth (ft): 2.715

Total Measurement Duration (s): 1274.00

File Name	Mean Temp (°C)	Width (ft)	Area (ft ²)	Mean Boat Speed (ft/s)	Mean V (ft/s)	Invalid Depth Cells (%)	Invalid Ens (%)
02-Transect_20250509143139.mat	24.8	46.633	85.591	0.382	2.939	8.5	11.6
03-Transect_20250509143615.mat	24.8	47.595	81.97	0.44	2.887	12.4	23.6
04-Transect_20250509144012.mat	24.8	44.257	79.754	0.38	2.834	7.9	12.3
05-Transect_20250509144344.mat	24.9	48.813	84.183	0.416	2.862	10.9	24.4
06-Transect_20250509144723.mat	24.9	44.136	81.365	0.376	2.709	4.2	10.6
07-Transect_20250509145050.mat	25	49.91	85.11	0.439	2.782	10.1	17.8
Mean	24.8	46.891	82.995	0.406	2.836	9	16.7

Edges

File Name	Left Edge Type	Right Edge Type	Left Edge Distance (ft)	Right Edge Distance (ft)	Left Q (ft ³ / s)	Right Q (ft ³ / s)
02-Transect_20250509143139.mat	Triangular	User Q	1	1	1.735	0.1
03-Transect_20250509143615.mat	Triangular	User Q	1	1	1.355	0.1
04-Transect_20250509144012.mat	Triangular	User Q	1	1	1.539	0.1
05-Transect_20250509144344.mat	Triangular	User Q	1	1	1.516	0.1
06-Transect_20250509144723.mat	Triangular	User Q	1	1	1.493	0.1
07-Transect_20250509145050.mat	Triangular	User Q	1	1	1.683	0.1
Mean	-	-	1	1	1.553	0.1

Processing

Software:QRev 4.38
Navigation Reference:BT
Composite Tracks:Off
Magnetic Variation:13.40
Salinity:0.0
Depth Reference:BT
Extrapolation Method (Top/Bottom Exponent):
Power / Power Exp: 0.1613

Instrument Details

Model:RS5
Frequency:Multi
Serial Number:RS52441001
Firmware Version:1.51
Instrument Configuration:

Quality Assurance

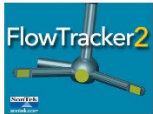
Diagnostic Test Results:Pass
Compass Calibration Results:Yes
Moving Bed Test Type:Stationary
Moving Bed Condition:No

User Comments

QRev Messages

Compass: One or more transects have a change in mag field exceeding 2%;Edges: Excessive boat movement in edge ensembles;Edges: The percent of invalid ensembles exceeds 25% in one or more transects;Temperature: No independent temperature reading;Site Info: Station number not entered;vtg-Int. Q for invalid ensembles in a transect exceeds 10.0%;Edges: User modified right edge type;Edges: User modified right user discharge.
QRev Summary File: 20250602_101938_438_QRev

6.1.2.5 TMCK06



Discharge Measurement Summary

Site name	1139.14.03.03_TMCK06
Site number	
Operator(s)	DM
File name	1139_14_03_03_TMCK06_20240620-101744.ft
Comment	

Start time	6/20/2024 9:05 AM	Sensor type	Top Setting
End time	6/20/2024 10:11 AM	Handheld serial number	FT2H2126012
Start location latitude	39.986	Probe serial number	FT2P2127007
Start location longitude	-122.122	Probe firmware	1.30
Calculations engine	FlowTracker2	Handheld software	1.7

# Stations	Avg interval (s)	Total discharge (ft³/s)
31	40	28.3415

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
30.300	28.9818	30.650

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
27	0.956	0.9779

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
71.630	1.300	1.4763

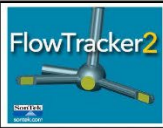
Discharge Uncertainty		
Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.1%	1.9%
Velocity	0.3%	1.0%
Width	0.1%	0.1%
Method	1.4%	
# Stations	1.7%	
Overall	2.4%	2.4%

Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview
No changes were made to this file

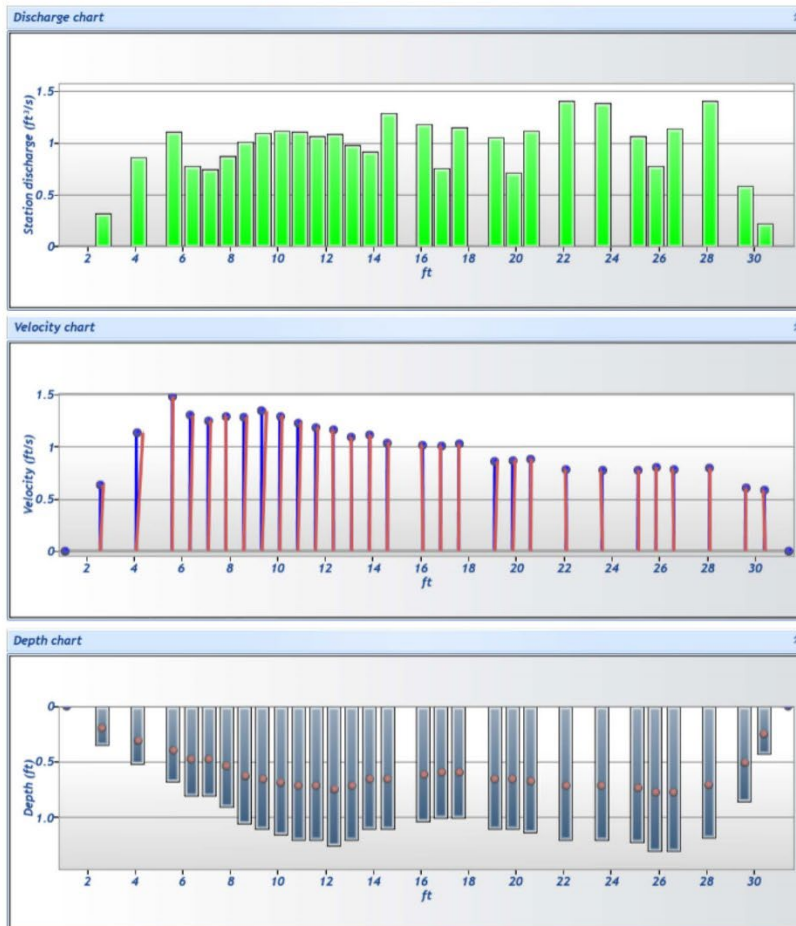
3/19/2026 10:33:01 AM



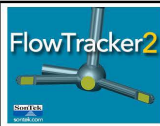
Discharge Measurement Summary

Site name 1139.14.03.03_TMCK06
Site number
Operator(s) DM
File name 1139_14_03_03_TMCK06_20240620-101744.ft
Comment

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%



3/19/2026 10:33:01 AM



Discharge Measurement Summary

Site name 1139.14.03.03_TMCK06
Site number
Operator(s) DM
File name 1139_14_03_03_TMCK06_20240620-101744.ft
Comment

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft ²)	Flow (ft ³ /s)	%Q	
0	9:05 AM	1.100	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.6329	0.0000	0.0000	0.00	✓
1	9:07 AM	2.600	0.6	0.340	0.6000	0.204	80	0.6329	1.0000	0.6329	0.5100	0.3228	1.14	✓
2	9:10 AM	4.100	0.6	0.510	0.6000	0.306	80	1.1293	1.0000	1.1293	0.7650	0.8639	3.05	✓
3	9:14 AM	5.600	0.6	0.670	0.6000	0.402	80	1.4763	1.0000	1.4763	0.7538	1.1127	3.93	✓
4	10:09 AM	6.350	0.6	0.800	0.6000	0.480	80	1.2952	1.0000	1.2952	0.6000	0.7771	2.74	✓
5	9:17 AM	7.100	0.6	0.800	0.6000	0.480	80	1.2460	1.0000	1.2460	0.6000	0.7476	2.64	✓
6	10:11 AM	7.850	0.6	0.900	0.6000	0.540	80	1.2936	1.0000	1.2936	0.6750	0.8732	3.08	✓
7	9:19 AM	8.600	0.6	1.050	0.6000	0.630	80	1.2836	1.0000	1.2836	0.7875	1.0109	3.57	✓
8	9:53 AM	9.350	0.6	1.100	0.6000	0.660	80	1.3374	1.0000	1.3374	0.8250	1.1034	3.89	✓
9	9:21 AM	10.100	0.6	1.150	0.6000	0.690	80	1.2935	1.0000	1.2935	0.8625	1.1156	3.94	✓
10	9:56 AM	10.850	0.6	1.200	0.6000	0.720	80	1.2296	1.0000	1.2296	0.9000	1.1066	3.90	✓
11	9:23 AM	11.600	0.6	1.200	0.6000	0.720	80	1.1841	1.0000	1.1841	0.9000	1.0657	3.76	✓
12	9:58 AM	12.350	0.6	1.250	0.6000	0.750	80	1.1589	1.0000	1.1589	0.9375	1.0865	3.83	✓
13	9:25 AM	13.100	0.6	1.200	0.6000	0.720	80	1.0903	1.0000	1.0903	0.9000	0.9813	3.46	✓
14	10:01 AM	13.850	0.6	1.100	0.6000	0.660	80	1.1107	1.0000	1.1107	0.8250	0.9163	3.23	✓
15	9:29 AM	14.600	0.6	1.100	0.6000	0.660	80	1.0412	1.0000	1.0412	1.2375	1.2885	4.55	✓
16	9:31 AM	16.100	0.6	1.030	0.6000	0.618	80	1.0202	1.0000	1.0202	1.1588	1.1821	4.17	✓
17	10:02 AM	16.850	0.6	1.000	0.6000	0.600	80	1.0052	1.0000	1.0052	0.7500	0.7539	2.66	✓
18	9:32 AM	17.600	0.6	1.000	0.6000	0.600	80	1.0232	1.0000	1.0232	1.1250	1.1510	4.06	✓
19	9:34 AM	19.100	0.6	1.100	0.6000	0.660	80	0.8528	1.0000	0.8528	1.2375	1.0553	3.72	✓
20	10:06 AM	19.850	0.6	1.100	0.6000	0.660	80	0.8721	1.0000	0.8721	0.8250	0.7195	2.54	✓
21	9:36 AM	20.600	0.6	1.130	0.6000	0.678	80	0.8816	1.0000	0.8816	1.2713	1.1207	3.95	✓
22	9:38 AM	22.100	0.6	1.200	0.6000	0.720	80	0.7796	1.0000	0.7796	1.8000	1.4033	4.95	✓
23	9:39 AM	23.600	0.6	1.200	0.6000	0.720	80	0.7693	1.0000	0.7693	1.8000	1.3847	4.89	✓
24	9:41 AM	25.100	0.6	1.220	0.6000	0.732	80	0.7743	1.0000	0.7743	1.3725	1.0627	3.75	✓
25	10:04 AM	25.850	0.6	1.300	0.6000	0.780	80	0.7993	1.0000	0.7993	0.9750	0.7793	2.75	✓
26	9:42 AM	26.600	0.6	1.300	0.6000	0.780	80	0.7832	1.0000	0.7832	1.4625	1.1455	4.04	✓
27	9:44 AM	28.100	0.6	1.180	0.6000	0.708	80	0.7929	1.0000	0.7929	1.7700	1.4034	4.95	✓
28	9:46 AM	29.600	0.6	0.850	0.6000	0.510	80	0.6028	1.0000	0.6028	0.9775	0.5892	2.08	✓
29	9:49 AM	30.400	0.6	0.420	0.6000	0.252	80	0.5786	1.0000	0.5786	0.3780	0.2187	0.77	✓
30	9:51 AM	31.400	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.5786	0.0000	0.0000	0.00	✓

3/19/2026 10:33:01 AM

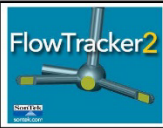
Discharge Measurement Summary

Site name	1139.14.03.03_TMCK06
Site number	
Operator(s)	DM
File name	1139_14_03_03_TMCK06_20240620-101744.ft
Comment	

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	15.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings						
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)
No quality control warnings						

3/19/2026 10:33:01 AM

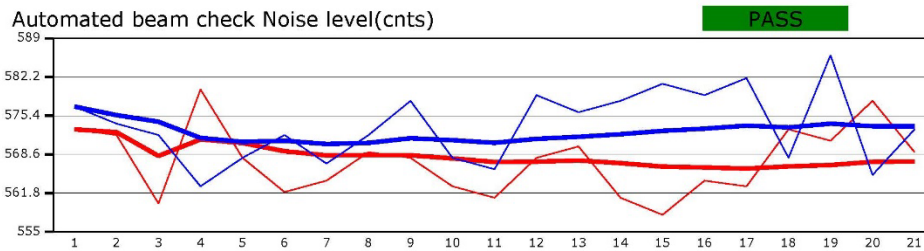
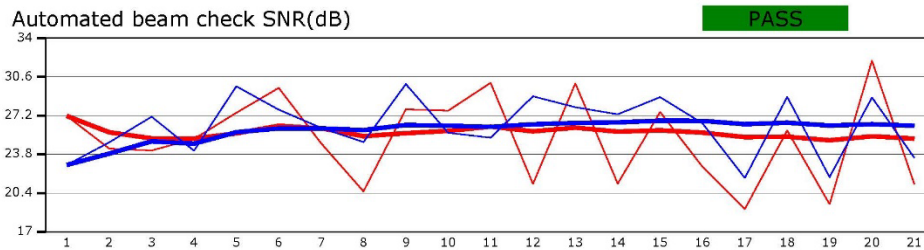


Discharge Measurement Summary

Site name 1139.14.03.03_TMCK06
Site number
Operator(s) DM
File name 1139_14_03_03_TMCK06_20240620-101744.ft
Comment

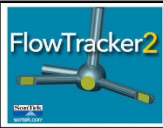
Beam 1	
Beam 2	

Automated beam check Start time 6/20/2024 9:04:50 AM



Automated beam check Quality control warnings
 No quality control warnings

3/19/2026 10:33:01 AM

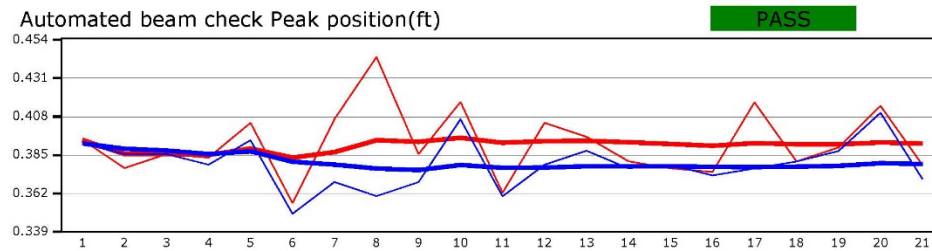
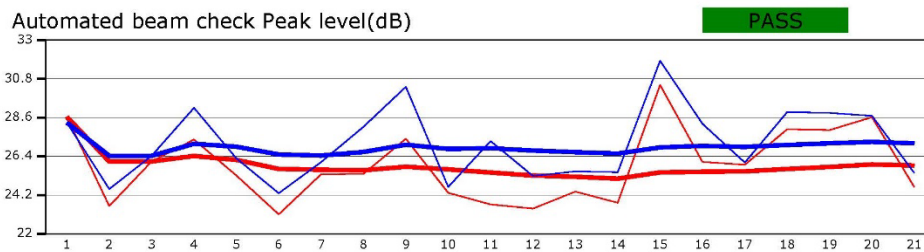


Discharge Measurement Summary

Site name 1139.14.03.03_TMCK06
Site number
Operator(s) DM
File name 1139_14_03_03_TMCK06_20240620-101744.ft
Comment

Beam 1	
Beam 2	

Automated beam check Start time 6/20/2024 9:04:50 AM



Automated beam check Quality control warnings
 No quality control warnings

3/19/2026 10:33:01 AM

QRev Discharge Summary Note

Station Name: TMCK06

Site ID:

Total Q (ft³/s): 211.708

Date: 05/09/2025

Estimated Uncertainty (%): 6.9

Transect Discharge

File Name	Start Time	End Time	Start Edge	Top Q (ft ³ /s)	Middle Q (ft ³ /s)	Bottom Q (ft ³ /s)	Total Q (ft ³ /s)
01-Transsect_20250509124253.mat	12:46:35	12:49:50	Right	63.068	112.16	24.481	204.058
02-Transsect_20250509124953.mat	12:50:03	12:53:41	Left	66.262	118.725	26.444	214.928
03-Transsect_20250509125344.mat	12:53:54	12:57:28	Right	63.55	115.673	25.561	208.705
04-Transsect_20250509125730.mat	12:57:42	13:01:32	Left	67.555	120.276	27.673	219.139
Mean	-	-	-	65.109	116.709	26.04	211.708

Measurement Details

Mean Measurement Depth (ft): 1.302

Maximum Measurement Depth (ft): 2.475

Total Measurement Duration (s): 857.00

File Name	Mean Temp (°C)	Width (ft)	Area (ft ²)	Mean Boat Speed (ft/s)	Mean V (ft/s)	Invalid Depth Cells (%)	Invalid Ens (%)
01-Transsect_20250509124253.mat	24.6	61.213	80.424	0.406	2.537	1.2	7.7
02-Transsect_20250509124953.mat	24.3	61.838	80.006	0.36	2.686	1	5.5
03-Transsect_20250509125344.mat	24.2	62.859	81.287	0.373	2.568	1.8	6.1
04-Transsect_20250509125730.mat	24.3	62.807	82.039	0.354	2.671	1.7	3.9
Mean	24.3	62.179	80.939	0.373	2.615	1.4	5.8

Edges

File Name	Left Edge Type	Right Edge Type	Left Edge Distance (ft)	Right Edge Distance (ft)	Left Q (ft ³ /s)	Right Q (ft ³ /s)
01-Transsect_20250509124253.mat	Triangular	Triangular	1.5	3	1.651	2.698
02-Transsect_20250509124953.mat	Triangular	Triangular	1.5	3	1.649	1.848
03-Transsect_20250509125344.mat	Triangular	Triangular	1.5	3	1.884	2.038
04-Transsect_20250509125730.mat	Triangular	Triangular	1.5	3	1.925	1.71
Mean	-	-	1.5	3	1.777	2.073

Processing

Software:QRev 4.38
Navigation Reference:BT
Composite Tracks:Off
Magnetic Variation:13.40
Salinity:0.0
Depth Reference:BT
Extrapolation Method
(Top/Bottom Exponent):
Constant / No Slip Exp: 0.1837

Instrument Details

Model:RS5
Frequency:Multi
Serial Number:RS52441001
Firmware Version:1.51
Instrument Configuration:

Quality Assurance

Diagnostic Test Results:Pass
Compass Calibration Results:Yes
Moving Bed Test Type:None
Moving Bed Condition:

User Comments

QRev Messages

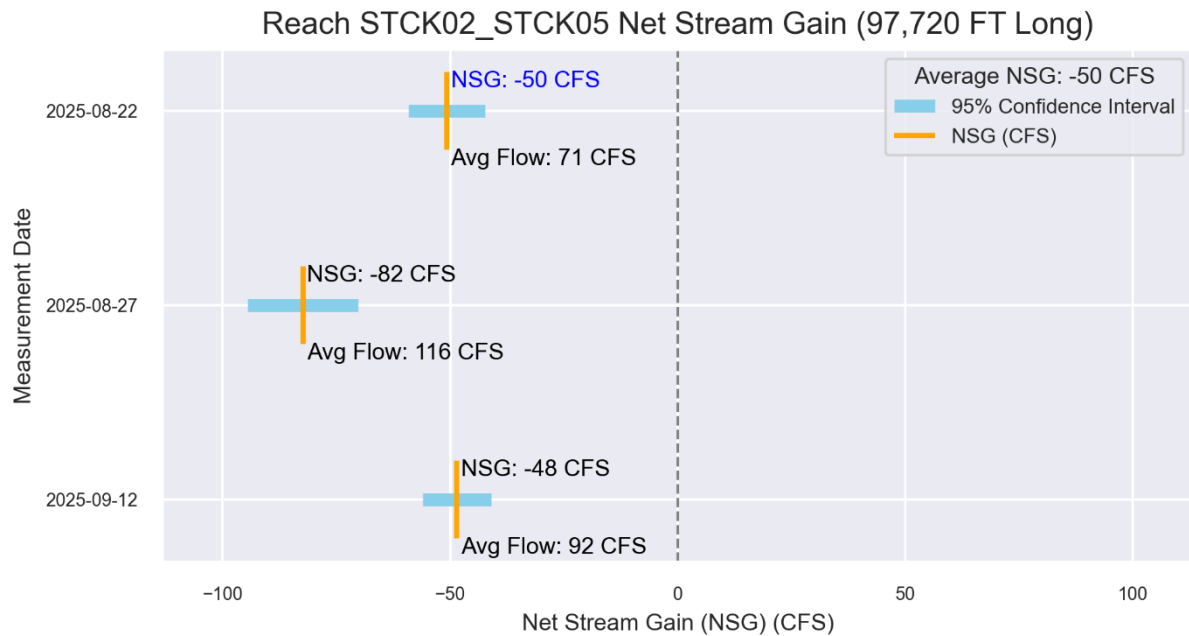
WARNING: QRev (Left) and Moving Bed tests for Q for invalid ensembles in a transect exceeds 10.0% and Q for invalid ensembles in a transect exceeds 10.0%;Compass: Calibration result > 0.2 deg/gga-Int. Q for invalid ensembles in a transect exceeds 10.0%;Temperature: No independent temperature reading;Site Info: Station number not entered;
QRev Summary File: 20250602_102552_438_QRev



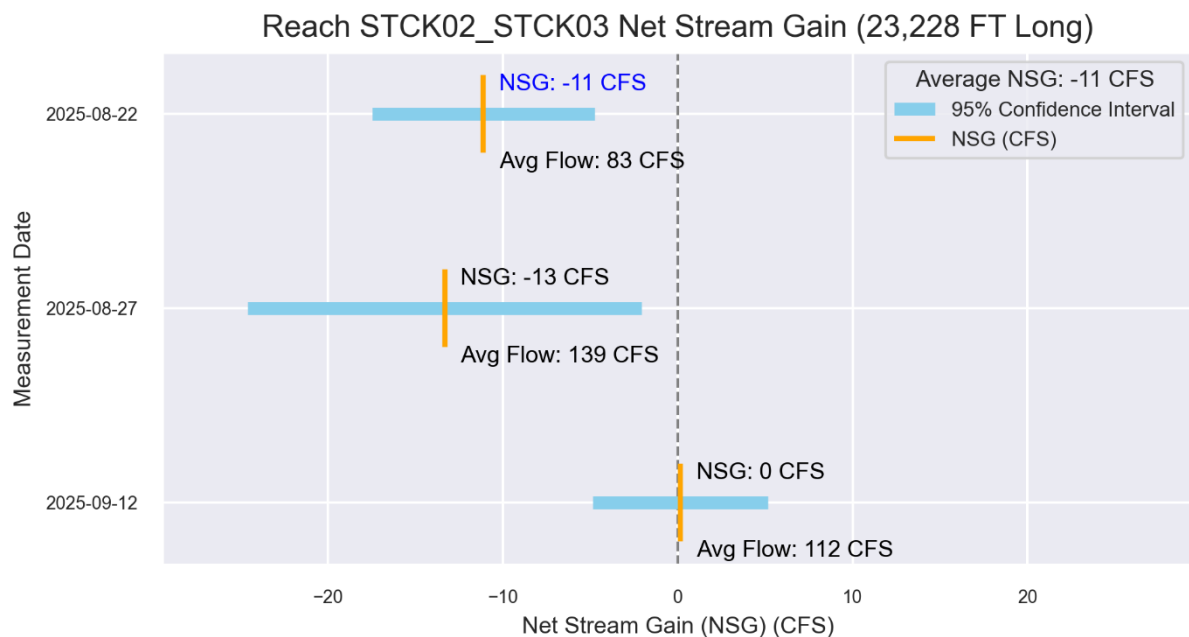
6.2 Stream Reach Water Budget Plots

6.2.1 Stoney Creek

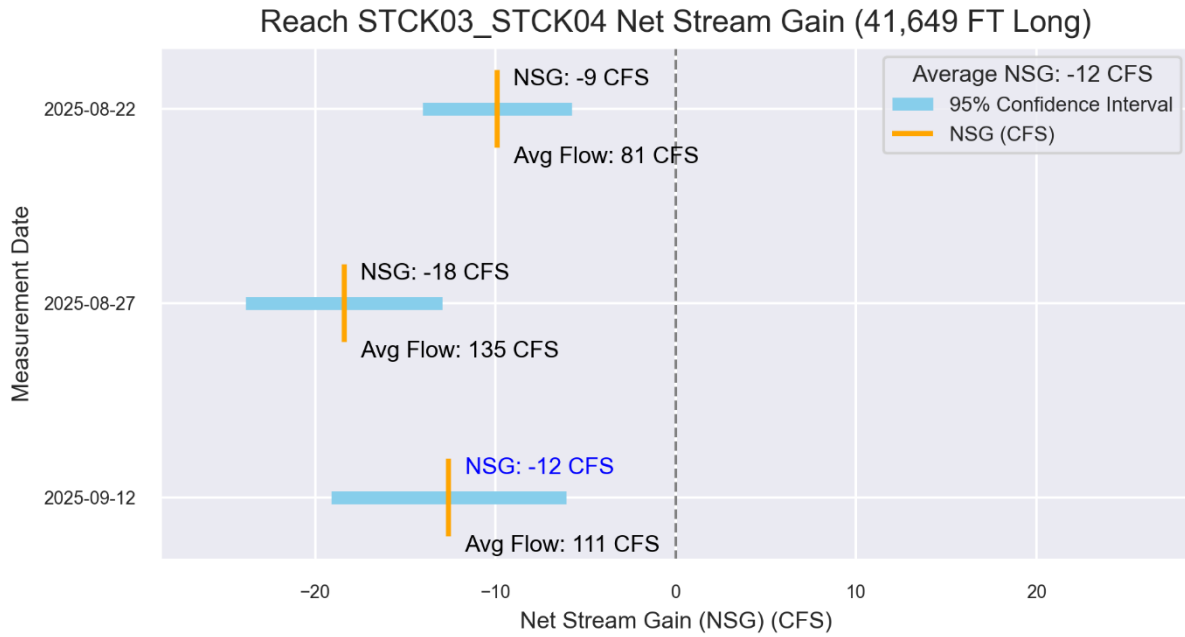
6.2.1.1 STCK02_STCK05



6.2.1.2 STCK02_STCK03

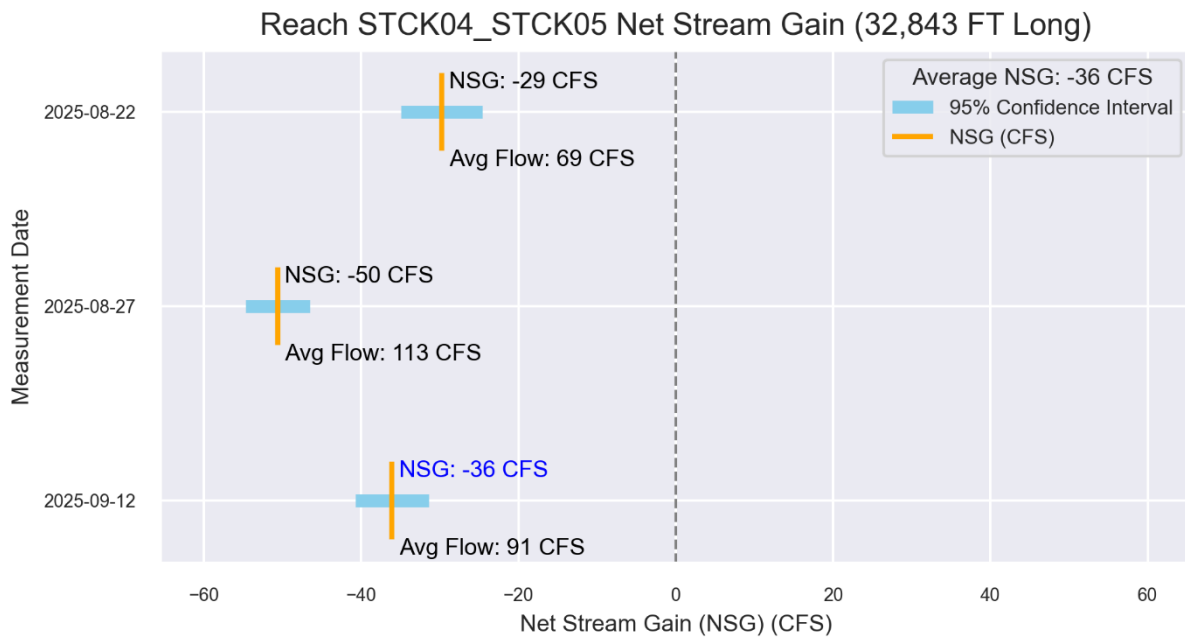


6.2.1.3 STCK03_STCK04



Note: A Positive NSG indicates a gaining reach, while a Negative NSG indicates a losing reach. Avg Flow is the average flow during the stream-reach water budget. The Average NSG is calculated based on the average of all values after the highest and lowest are removed if there are more than 3 measurements, and those values are highlighted in blue.

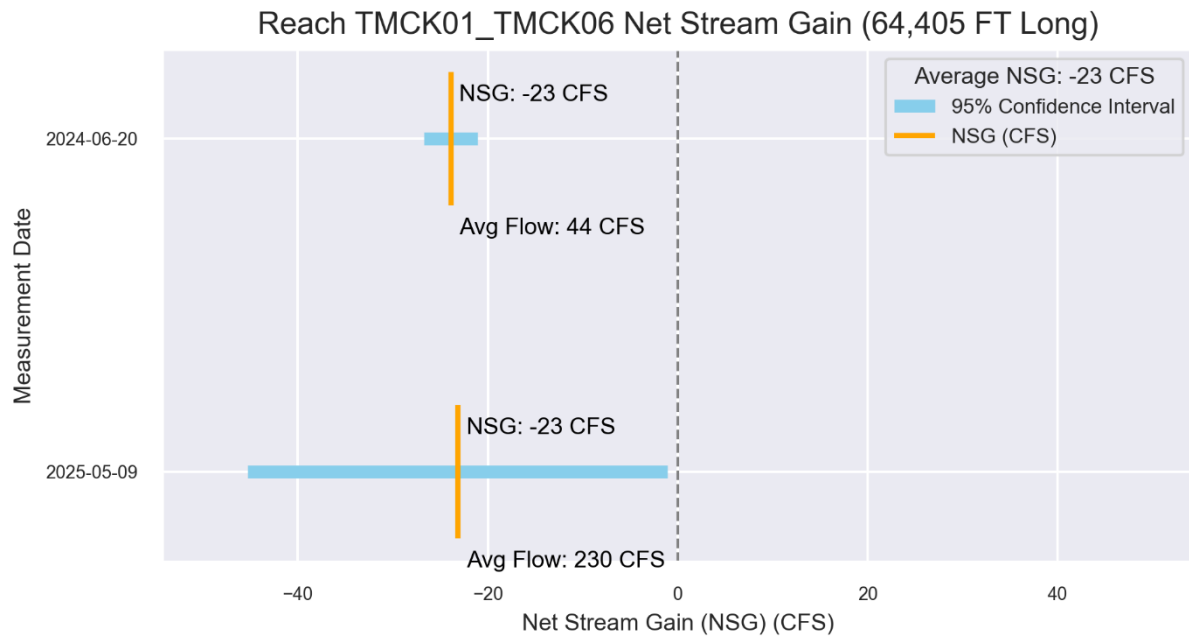
6.2.1.4 STCK04_STCK05



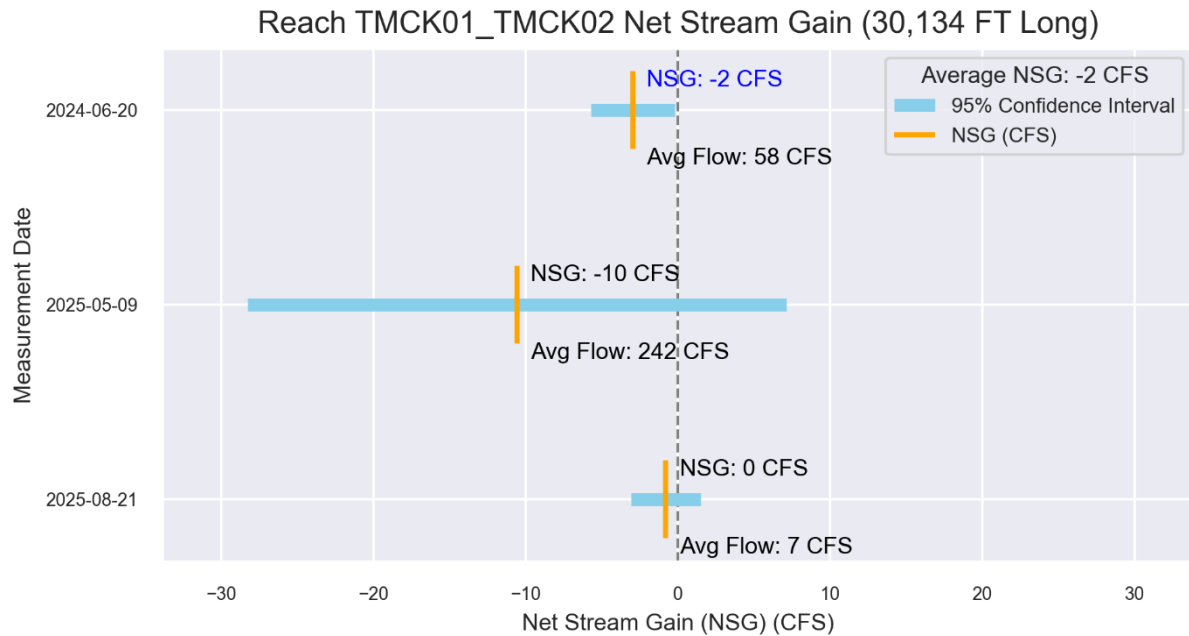
Note: A Positive NSG indicates a gaining reach, while a Negative NSG indicates a losing reach. Avg Flow is the average flow during the stream-reach water budget. The Average NSG is calculated based on the average of all values after the highest and lowest are removed if there are more than 3 measurements, and those values are highlighted in blue.

6.2.2 Thomes Creek

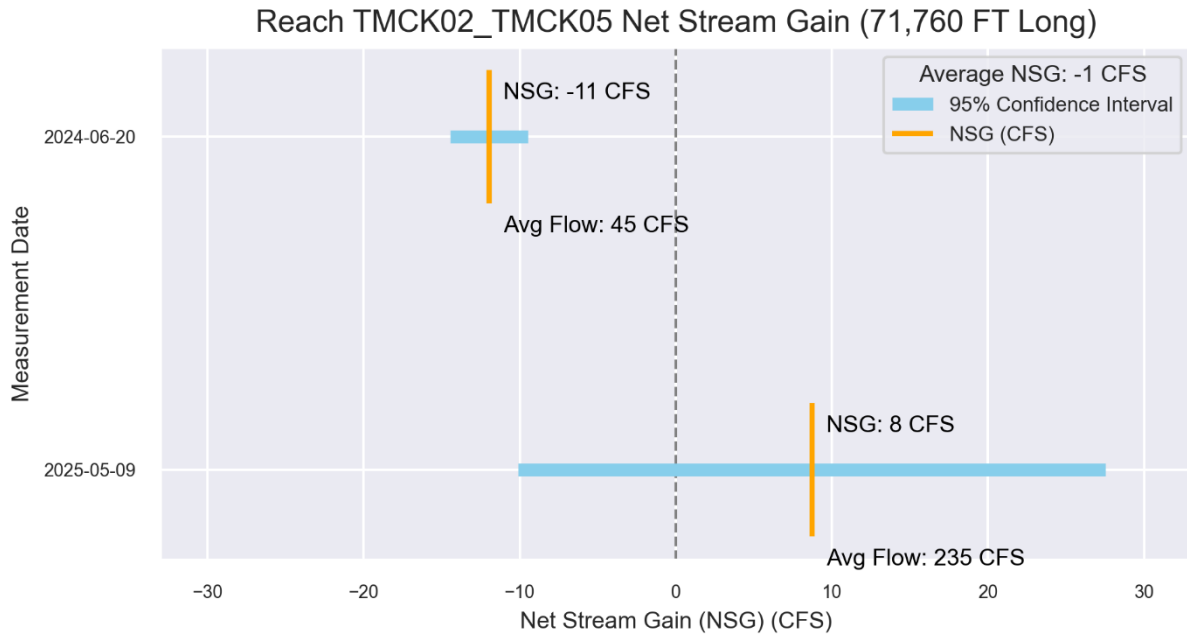
6.2.2.1 TMCK01_TMCK06



6.2.2.2 TMCK01_TMCK02

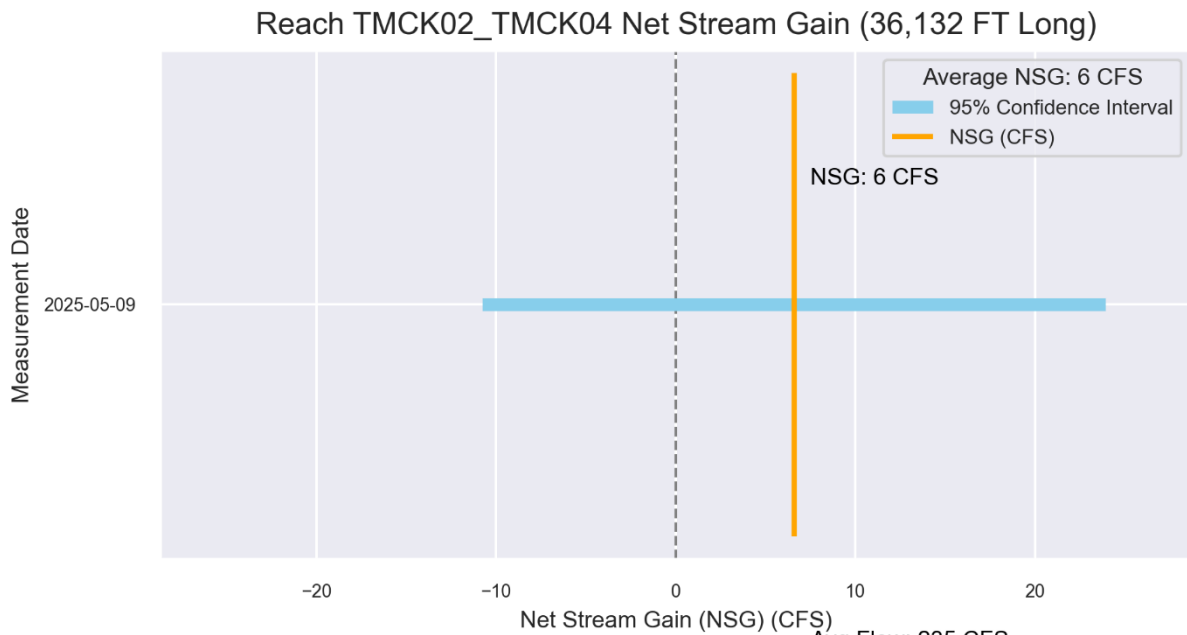


6.2.2.3 TMCK02_TMCK05



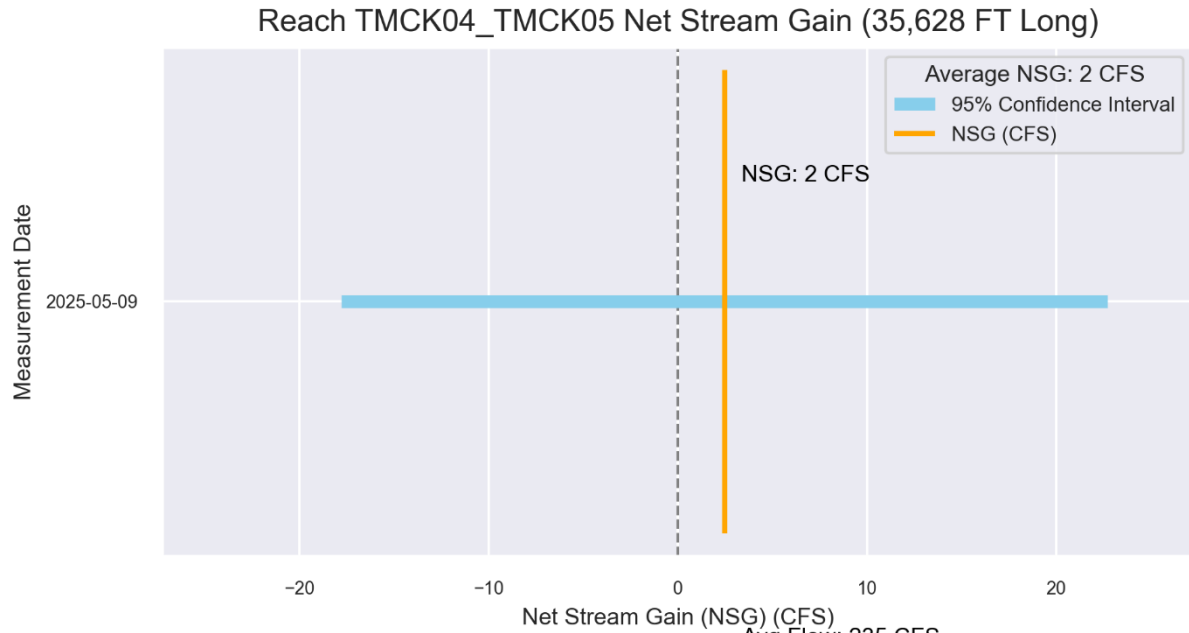
Note: A Positive NSG indicates a gaining reach, while a Negative NSG indicates a losing reach. Avg Flow is the average flow during the stream-reach water budget. The Average NSG is calculated based on the average of all values after the highest and lowest are removed if there are more than 3 measurements, and those values are highlighted in blue.

6.2.2.4 TMCK02_TMCK04



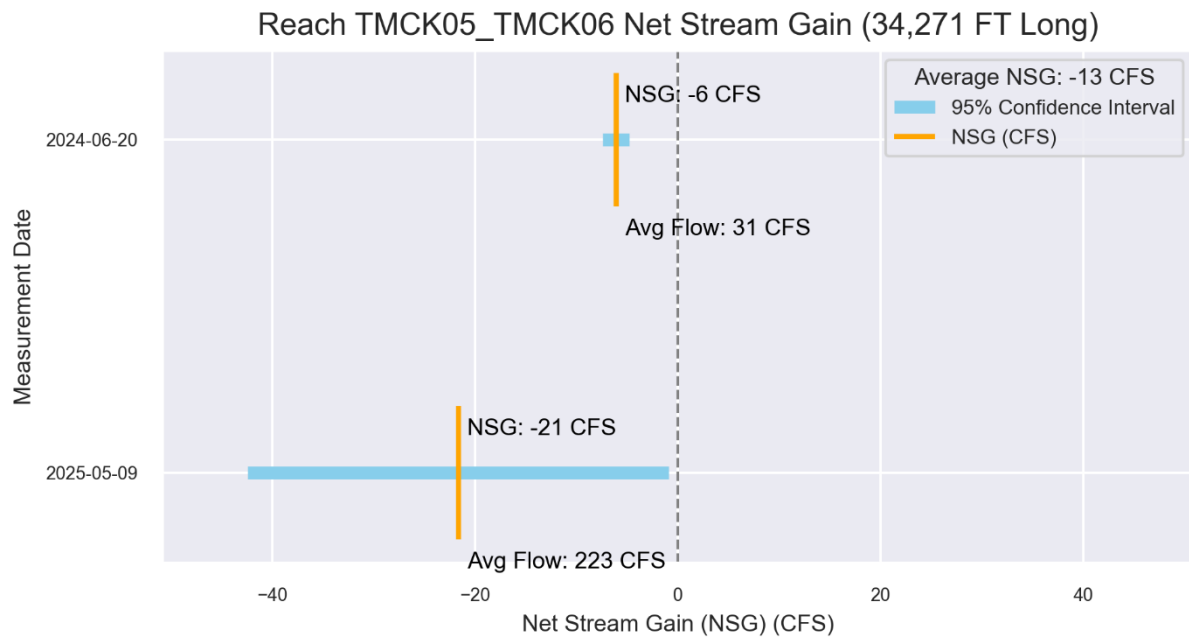
Note: A Positive NSG indicates a gaining reach, while a Negative NSG indicates a losing reach. Avg Flow is the average flow during the stream-reach water budget. The Average NSG is calculated based on the average of all values after the highest and lowest are removed if there are more than 3 measurements, and those values are highlighted in blue.

6.2.2.5 TMCK04_TMCK05



Note: A Positive NSG indicates a gaining reach, while a Negative NSG indicates a losing reach. Avg Flow is the average flow during the stream-reach water budget. The Average NSG is calculated based on the average of all values after the highest and lowest are removed if there are more than 3 measurements, and those values are highlighted in blue.

6.2.2.6 TMCK05_TMCK06



Note: A Positive NSG indicates a gaining reach, while a Negative NSG indicates a losing reach. Avg Flow is the average flow during the stream-reach water budget. The Average NSG is calculated based on the average of all values after the highest and lowest are removed if there are more than 3 measurements, and those values are highlighted in blue.