Use the Stream Quantification Tool in your state.

The modular design of the SQT enables its parameters and metrics to be regionalized and used in settings as diverse as Alaska and Tennessee. To use the SQT in a new location, the existing tool must first be regionalized to account for local conditions. The SQT regionalization process is facilitated by staff from Stream Mechanics and Ecosystem Planning and Restoration who provide project management, technical assistance, reference curve data collection, user manual and related SQT document creation, and programmatic guidance to members of a Steering and Technical committee.

The Steering Committee provides overall input and strategy on how the SQT will be used within mitigation and/or stream restoration programs, while the Technical Committee assists with selecting metrics and developing reference curves used to communicate attainment of, or departure from, reference standard. The Technical and Steering Committees are comprised of agency staff or other subject matter experts.

The regionalization process takes between 8 and 12+ months. This timeline can be extended to accommodate stakeholder engagement meetings, trainings, creation of additional documents, or to accommodate funding constraints.

Want to learn more?

For SQT training, applied research, and technical assistance, contact Will Harman: wharman@stream-mechanics.com

Ready to get started?

For assistance with regionalization and SQT development assistance, contact Paxton Ramsdell: pramsdell@eprusa.net

Connect with us:

Ecosystem Planning & Restoration
www.eprusa.net

StreamMechanics
Restoring Stream Ecosystems
www.Stream-Mechanics.com

Function-based Stream Assessment Tool

Stream Quantification Tool

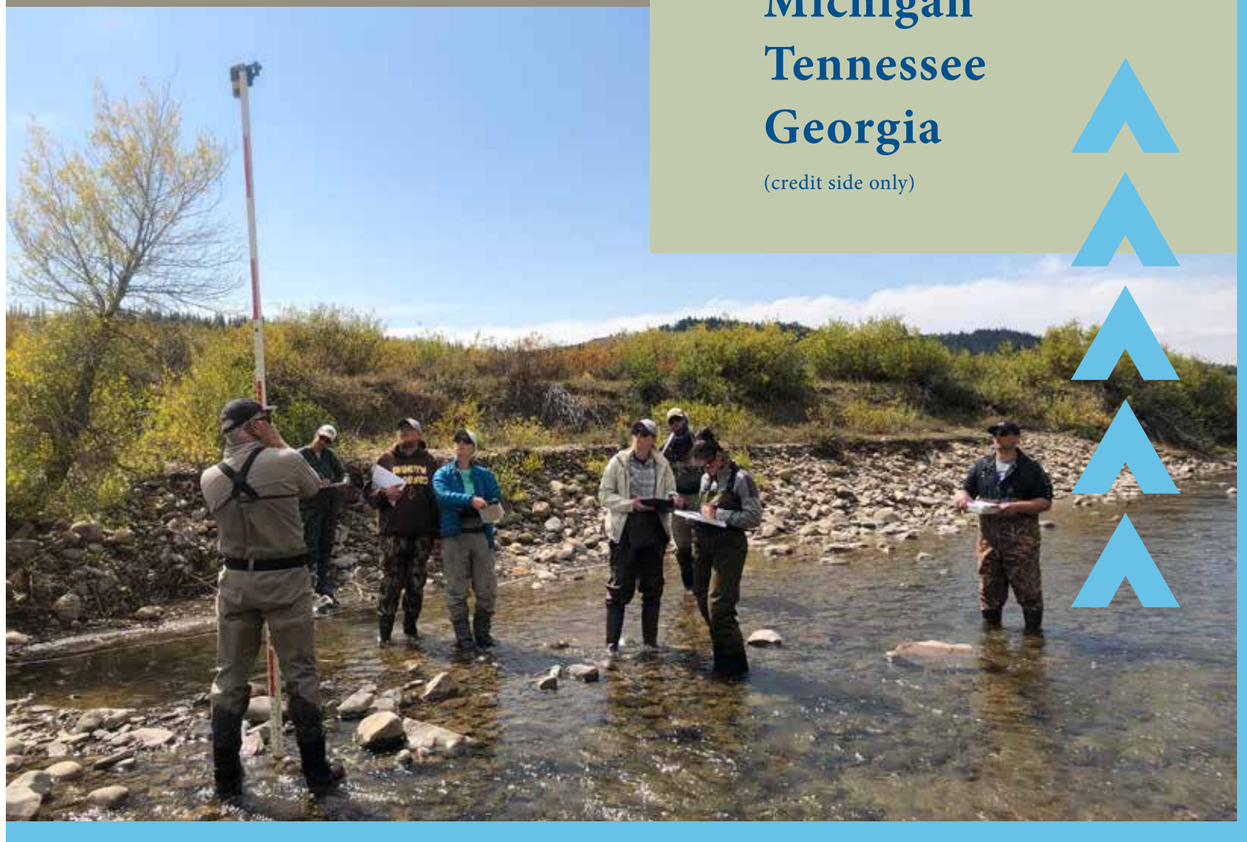
Designed for stream mitigation and restoration programs, the Stream Quantification Tool (SQT) links stream restoration activities to changes in stream functions using science-based measurement methods. The result? Greater certainty that stream restoration dollars directly relate to improvement in stream condition.

Ecosystem Planning & Restoration

StreamMechanics
Restoring Stream Ecosystems

The SQT was created to fulfill the following needs:

- Provide a calculator to determine the numerical differences between an existing (degraded) stream condition and the proposed (restored or enhanced) stream condition. This numerical difference is known as functional lift or uplift and is often used to determine stream credits as defined by the 2008 Federal Mitigation Rule.
- Match debits and credits: The SQT has been configured as a debit calculator capable of communicating functional loss from common development activities such as culverts, impoundments and piping. When used together, the SQT and Debit Calculator can provide certainty that debits are being properly offset by function-based credits.
- Incentivize high-quality stream restoration and mitigation by matching restoration goals with each site's restoration potential. The SQT can provide greater certainty to agencies, mitigation providers and the public that restoration activities proposed at a certain site will deliver intended benefits for years to come.



The following states have regionalized the SQT to inform credit generation and paired the SQT with a Debit Calculator to quantify debits from stream impacts:

Alaska
Wyoming
Colorado
Minnesota
Michigan
Tennessee
Georgia

(credit side only)

Measuring Functional Change at the Reach Scale

The SQT uses a 0 – 1.0 scoring methodology, with scores from 0 – 0.29 considered Not Functioning, scores from 0.30 to 0.69 considered Functioning at Risk, and scores 0.70 and above considered Functioning.

To measure functional change at a reach, users enter field collected and modeled data into the SQT. The SQT automatically calculates the delta between a stream reach's existing condition score and that same reach's proposed condition score. That score is multiplied by the reach's total length or area to generate a functional foot or functional acre score (or another unit of measure). This final score can then be used by agencies to inform credit or debit determinations.

TABLE 1: FUNCTIONAL CHANGE SUMMARY

Existing Condition Score	0.28 (Not Functioning)
Proposed Condition Score	0.52 (Functioning at Risk)
Change in Overall Condition (uplift)	0.24
Existing Stream Length (ft)	523 Linear Feet
Proposed Stream Length (ft)	677 Linear Feet
Change in Stream Length (ft)	154 Linear Feet
Existing Functional Feet	146 Functional Feet (P2)
Proposed Functional Feet	352 Functional Feet (P2)
Total Uplift	+206 Functional Feet

TABLE 2: PROJECT REACH FUNCTION BASED PARAMETERS SUMMARY

Functional Category	Function-Based Parameters	Existing Parameter	Proposed Parameter	As-Built	Monitoring Year 1	2	3	4	5	10
Reach Hydrology & Hydraulics	Reach Runoff	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
	Baseflow Dynamics									
	Floodplain Connectivity	0.71	0.71	1.00	1.00	1.00	1.00	0.98	0.95	0.95
Geomorphology	Large Woody Debris	0.00	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
	Lateral Migration	0.52	0.97	0.83	0.84	0.85	0.91	0.94	0.94	0.97
	Bed Form Diversity	0.39	0.82	0.82	0.82	0.82	0.79	0.79	0.80	0.81
	Riparian Vegetation	0.24	0.66	0.58	0.60	0.75	0.75	0.84	0.66	0.84
Physicochemical	Temperature	0.71	0.78	0.51	0.61	0.61	0.61	0.61	0.71	0.78
	Dissolved Oxygen									
	Nutrients	0.13	0.19	0.12	0.12	0.12	0.12	0.12	0.15	0.19
Biology	Macroinvertebrates	0.20	0.26	0.18	0.19	0.20	0.20	0.22	0.23	0.26
	Fish	0.60	0.64	0.63	0.63	0.63	0.64	0.64	0.64	0.65

TABLE 3: FUNCTION BASED PARAMETERS SUMMARY

Functional Category	Function-Based Parameters	Existing Parameter	Proposed Parameter
Reach Hydrology & Hydraulics	Reach Runoff	0.89	0.92
	Baseflow Dynamics	0.00	0.00
	Floodplain Connectivity	0.71	0.71
Geomorphology	Large Woody Debris	0.00	0.57
	Lateral Migration	0.52	0.97
	Bed Form Diversity	0.39	0.82
	Riparian Vegetation	0.24	0.66
Physicochemical	Temperature	0.71	0.78
	Dissolved Oxygen	0.00	0.00
	Nutrients	0.13	0.19
Biology	Macroinvertebrates	0.20	0.26
	Fish	0.60	0.64

Table 1: Example SQT output from a hypothetical second order, perennial stream restoration project. Functional feet, the combination of a reach's overall condition score (uplift or loss) and stream length (linear feet) is often used to calculate debits and credits.

Table 2: The SQT accommodates multiple datasets including a stream's existing condition score, proposed condition score, as-built data, and up to ten years of monitoring data. The table shown here is from the Colorado SQT.

Table 3: The Function Based Parameters Summary, also shown here from the Colorado SQT, is used to determine which function-based parameters and/or categories had functional uplift or loss.