Summary:

Tahoe Aquatic Resources Inventory (TARI v2.1) was published on Feb 12th, 2016, and can be downloaded from http://www.sfei.org/data/tahoe-aquatic-resource-inventory-tari-version-21-gis-data.

TARI is a GIS dataset developed using standardized and documented mapping protocols to meet regional needs for assessing the distribution, abundance, and condition of wetlands and streams. It consists of lines and polygons representing the extent of stream reaches and wetland areas for 13 wetland types. The stream lines are attributed with Strahler stream order and flow direction.

The Version 2.1 TARI GIS dataset consists of a map of the aquatic resources (streams and wetlands) within the entire Tahoe basin. TARI v2 was initially drafted by the Spatial Informatics Group (SIG, 2015) who employed semi-automated techniques to extend the GIS dataset across the entire Tahoe basin. The mapping protocols that SIG used were based on the mapping procedures developed by the Tahoe WRAMP Demonstration Project (2013). The WRAMP project GIS team mapped two sub-watersheds within the Tahoe Basin (TARIv1), and the SIG project extended the map to the entire basin – basing their methodology on the mapping standards develop by the WRAMP Demonstration Project. SFEI improved on SIG's semi-automated, TARIv2 GIS dataset to bring it more in line with the published TARI mapping standards.

Detailed information about the TARI mapping standards and methodology can be found in *"Tahoe Aquatic Resource Inventory SOP: Mapping Standards and Methodology for Channels, Wetlands, and Riparian Areas in the Tahoe Basin"* which is included in the downloadable ZIP file, and also available online at:

- http://www.sfei.org/sites/default/files/biblio_files/TARI_mapping%20standards_v12%20Feb%2011%202013.pdf

More information on the Tahoe WRAMP Demonstration Project can be found online at:

- http://www.sfei.org/projects/tahoe-wramp-demonstration-watershed-assessment
- http://tahoemonitoring.org/wramp-overview.html

Description of Version Updates:

TARIv1 consisted of a GIS dataset of the aquatic resources (streams and wetlands) in two sub-watershed within the Tahoe basin: Third Creek watershed in Nevada and the Upper Truckee River watershed in California. The maps were developed as part of the Tahoe WRAMP Demonstration Project: a partnership led project to transfer GIS based aquatic resource mapping methodologies to Tahoe agencies, based on the Bay Area Aquatic Resources Inventory (BAARI). The project further developed mapping protocols for sloped wetlands and other aquatic features found in the Sierra Nevada. Two Tahoe agencies were directly involved in the mapping effort including Tahoe Regional Planning Agency (TRPA) and the California Tahoe Conservancy (CTC). The project was funded by the U.S. Environmental Protection Agency (USEPA) and led by SFEI. The Lahontan Regional Water Quality Control Board (RB6) and the State Water Resources Control Board were other project partners. The mapping team employed careful manual interpretation of available remotely sensed aerial imagery and LiDAR (2010) to map the aquatic resources in the two watershed and they conducted field exercises to verify and validate the maps.

TARIv2 was a semi-automated mapping effort conducted by SIG to more quickly map the remaining aquatic features within the Tahoe Basin (it includes the original TARIv1 data).

For streams, their approach consisted of two general phases. In the first phase a proprietary automated method was used to identify likely locations of streams based on areas of high flow accumulation in the 2010 LiDAR. This automated approached worked by filling sinks within the LiDAR-derived DEM, computing the flow direction using the D-Infinity algorithm, then finding stream segments based on areas of high flow accumulation. In the second phase the stream segments were manually reviewed and edited using the 2010 LiDAR and 201 WorldView-2 imagery.

For wetlands, mapping was conducted by SIG's GIS team trained on the TARI mapping standards. They used multi-band Imagery in combination with raster products created from the 2010 LiDAR (DEM, Slope, Aspect, etc) to identify wetlands and aquatic features in the Tahoe Basin. Multiple rounds of reviews were conducted to ensure accuracy and consistency in the data. Additional QAQC were conducted by SFEI.

TARIv2.1 includes edits and additions to the TARIv2 GIS data to bring it closer in line with the TARI standards laid out in the TARI SOP. The following edits were made by SFEI:

Streams:
Smoothing of stream lines
Planerizing of stream lines
Addition of Strahler stream order
Removal of first order streams under the minimum mapping unit
Manual classification of stream network

Wetlands:
Removal of polygonal slivers
Merging of some missing open water features
Some reclassification of wetlands to further match TARI SOP

Additionally edits were incorporated from input from the City of South Lake Tahoe, and Auerbach Engineering, which was submitted using the CARI editor.

Description of Attribute Fields

Streams

WetlandType: coded classification of the stream type. Codes are defined on p5-12 of "TARI Mapping Standards"

SourceDataset: source(s) from which the segment was digitized, or otherwise incorporated into TARI.

Comments: additional comments about feature designation.

ClickCode: simplification of the 'WetlandTyp' attribute used for map database queries in web mapping applications such as http://www.EcoAtlas.org

ClickLabel: verbal description of the ClickCode code

LegCode: further simplification of the 'WetlandTyp' attribute used in the legends of web mapping applications such as http://www.EcoAtlas.org

LegLabel: verbal description of the LegCode code

Strahler: Strahler stream order of the stream segment.

Wetlands

WetlandType: coded classification of the wetland type. Codes are defined on p5-12 of "TARI Mapping Standards"

SourceDataset: source(s) from which the wetland polygon was digitized, or otherwise incorporated into TARI

Notes: additional notes regarding classification

CLICKCODE: simplification of the 'WetlandTyp' attribute used for map database queries in web mapping applications such as http://www.EcoAtlas.org

CLICKLABEL: verbal description of the ClickCode code

NAT_UNNAT: natural vs unnatural designation. Derived from WetlandType

LEGLABEL: verbal description of the LegCode code

LEGCODE: further simplification of the 'WetlandTyp' attribute used in the legends of web mapping applications such as http://www.EcoAtlas.org

OpenWater: open water designation. Derived from WetlandType. "0" for not open water, "1" for open water feature.

Credits

Spatial Informatics Group, 2015, www.sig-gis.com
San Francisco Estuary Institute and Aquatic Science Center, 2016, www.sfei.org
Tahoe Regional Planning Agency (TRPA)
California Tahoe Conservancy (CTC)

Use limitations