A Thermal Map for all Oregon Streams

NorWeST StreamTemp

Scenario 1:
Mean August
Stream Temperatture
1993 - 2011

Stream sites with temperature data used to develop the thermal map for Oregon. Data consist of 18,774 summers of monitoring effort from 6,461 unique sites.

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The aquatics community within Oregon has amassed significant amounts of stream temperature data through their collective monitoring efforts in previous decades. As part of a West-wide effort, the NorWeST project has developed a comprehensive interagency stream temperature database for Oregon that consists of 18,774 summers of monitoring effort at 6,461 unique sites (map inset). Those data were used with spatial-statistical network models (details at the SSN/STARS website: www.fs.fed.us/rm/boise/AWAE/projects/SpatialStreamNetworks.shtml) to develop an accurate stream temperature model (R^2 = 90%; RMSE = 1.0°C), which was then used to predict 30 high-resolution (1 kilometer) historical and future climate scenarios for streams and rivers in Oregon. This poster depicts a historical scenario of the mean August temperature from 1993-2011 for 60,000 kilometers of stream mapped to the 1:100,000-scale NHDPlus hydrography layer trimmed to exclude intermittent reaches and those >15% slope. NorWeST stream temperature scenarios and state temperature maps are available in user-friendly digital formats (e.g., ArcGIS shapefiles and .pdf files) from the project website (www.fs.fed.us/rm/boise/AWAE/projects/NorWeST.html) and can also be viewed dynamically online using this webtool (www.sciencebase.gov/gisviewer/NorWeST/). Daily summaries (min/max/mean) of the temperature data used to develop the temperature model are also available through the website if permission was given for their distribution. All data are attributed to the original source agency and contributing biologists or hydrologists in metadata files. By providing open access to stream temperature information in user-friendly formats, the NorWeST project is facilitating coordination of monitoring activities among organizations, better conservation planning, and new research on temperature dynamics and thermal ecology.

The analytical infrastructure used to develop the Oregon stream temperature model consists of a new class of spatial-statistical model for data on stream networks that could also be used with water chemistry attributes (e.g., pH, alkalinity, conductivity, etc.), biological datasets (species occurrence, abundance, genetic attributes), or habitat surveys to provide a wealth of new information about streams. More details regarding those applications are provided in the references below and at the National Stream Internet Project website (www.fs.fed.us/rm/boise/AWAE/projects/
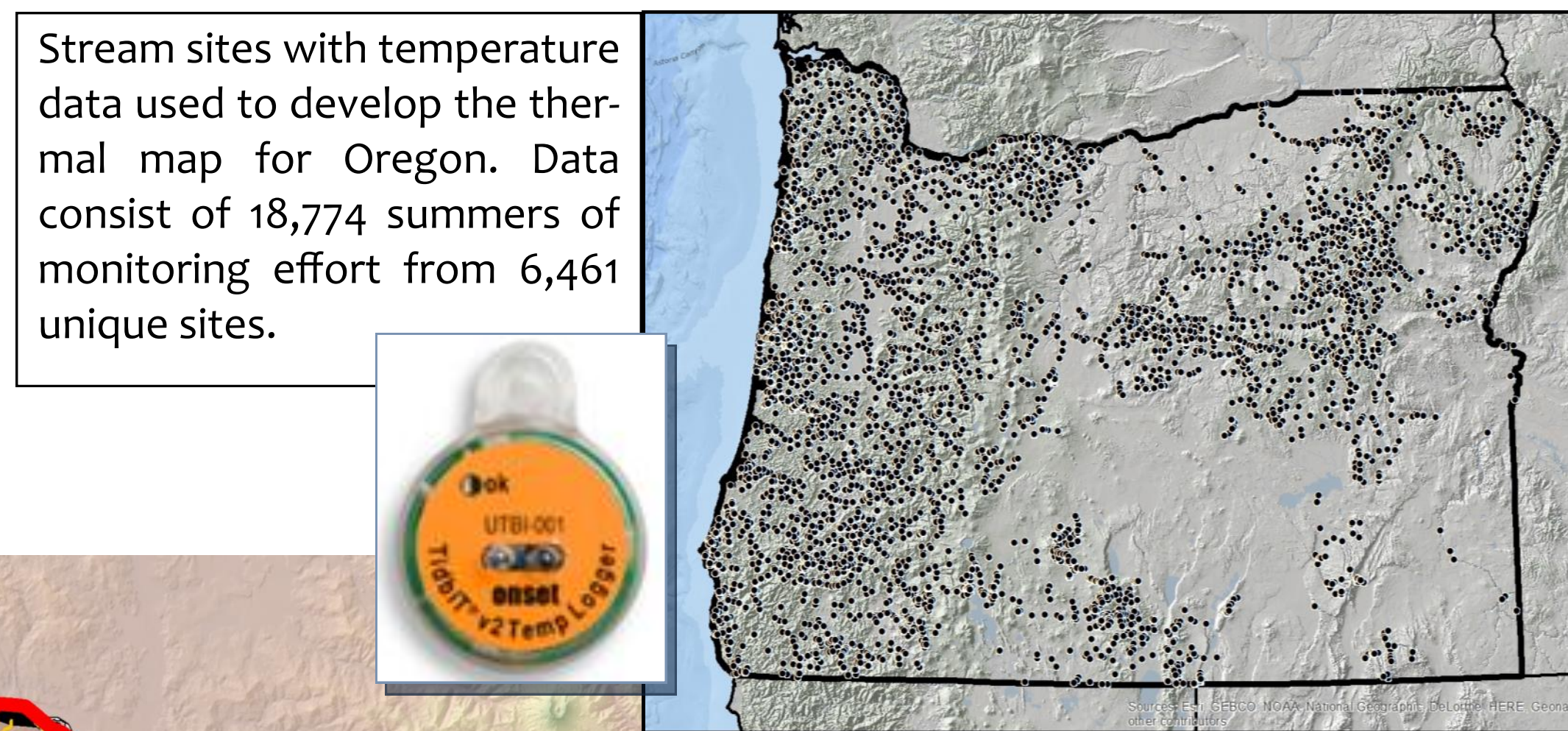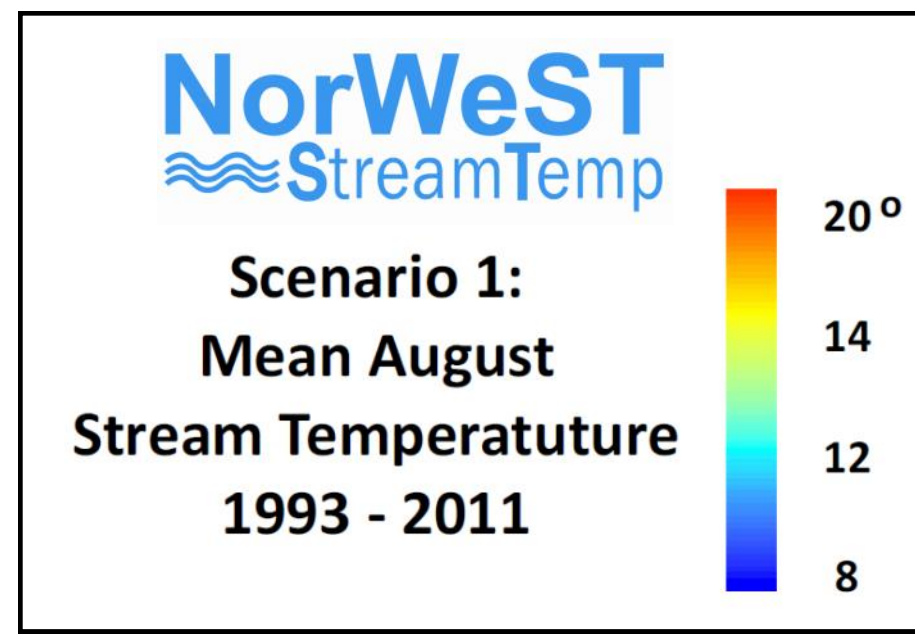
KEY REFERENCES

NorWeST Website: www.fs.fed.us/rm/boise/AWAE/projects/NorWeST.html

Spatial Statistical Network Models

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