

Climate Change Impacts on Water Quality & Aquatic Life at Pyramid Lake, Nevada

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Pyramid Lake and over 30 miles of the lower Truckee River lie entirely within the Pyramid Lake Paiute Tribal boundaries in northern Nevada. Pyramid Lake is a terminal lake for the Truckee River Watershed. Several long-term effects have been observed due to the region’s changing climate over the last 120+ years.

Pyramid Lake loses approximately 4 feet of lake elevation annually due to evaporation, which means 424,000 acre feet (AF) of water is needed from the Truckee River flows to maintain lake level. As the population increased in western Nevada from 1900 to 1967, Pyramid Lake dropped approximately 80 feet in elevation and lost 10.7 million AF of water due to Truckee River diversions and out of basin diversions to the new land developments (Figure 1).

During the extended drought of the 1930s, Winnemucca Lake dried up, and the original strain of Lahontan Cutthroat trout (*Oncorhynchus clarkii henshawii*) saw their last spawning run in 1938. As Total Dissolved Solids (TDS) levels increased (Figure 2), species abundance/diversity decreased. Pyramid Lake lost two native cyprinids, the Speckled dace (*Rhinichthys osculus*), and the Lahontan Redside shiner (*Richardsonius egregius*). Both cyprinids were important to the diet of the piscivorous Lahontan Cutthroat trout. Since 1866, Pyramid Lake TDS has increased from 1,500 to 5,900 mg/L. Many snail shells can still be observed along the beach shores of the lake, the result of lowering lake levels and rising TDS in a lake which has no outlet since the early 1900’s.

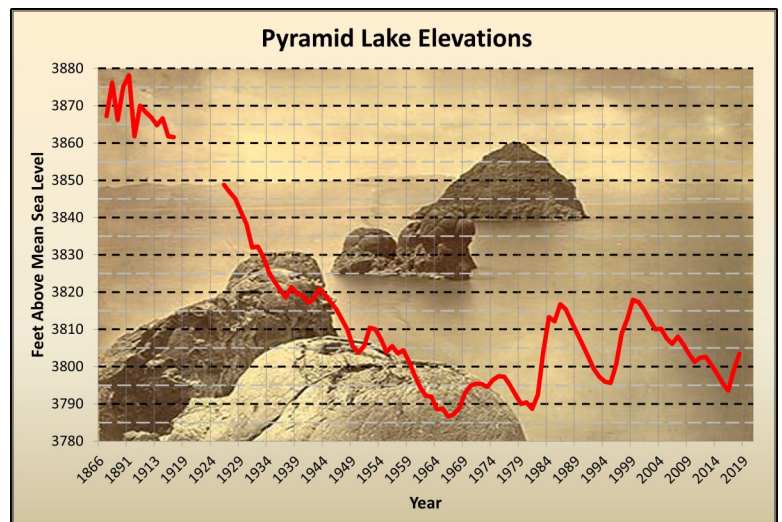


Figure 1: Historical Lake Elevations



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Climate Change Impacts on Water Quality & Aquatic Life at Pyramid Lake, NV (*continued*)

Pyramid Lake received a total of only 700,000 AF of water from the Truckee River from 1987 to 1994, which resulted in a 24-foot drop of lake elevation (Figure 2). During this period, Tribal water quality staff observed an anoxic layer of low dissolved oxygen at the bottom of the lake, which extended from five (5) meters to 30 meters from the bottom, which prevented the lake to completely turn over during winter. Pyramid Lake elevation rose 25 feet during a five (5) year period (1995 to 2000), and then dropped 26 feet during an extended 16-year drought through 2016.

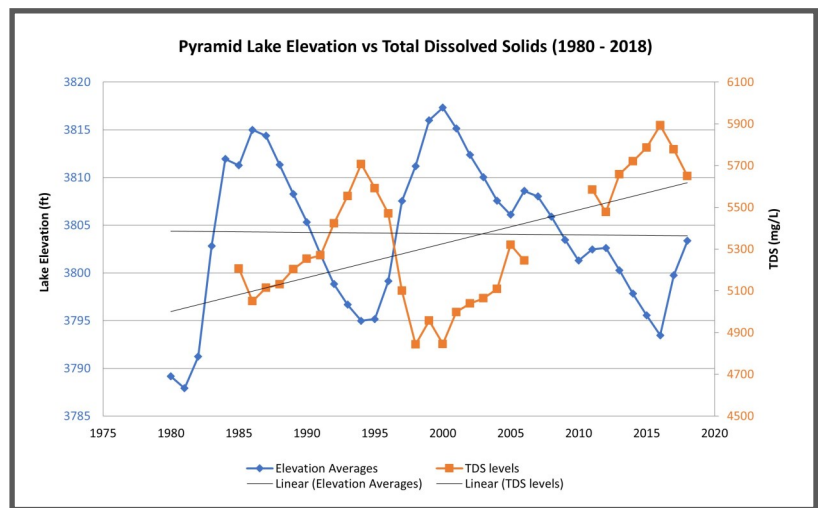


Figure 2: Pyramid Lake TDS

Pyramid Lake Total Dissolved Solids (TDS) increased from 1986 to 1994, and 2000 to 2016 (Figure 2). During these periods of drought, lake levels dropped 24 feet. In the early 1990s, Pyramid Lake Fisheries observed that spawning Lahontan Cutthroat trout were getting smaller in size, to the point the Tribe implemented a slot limit of 19 to 24 inches to protect bigger spawning fish. A limit of only one fish over 24 inches per day was implemented to protect the trophy size fish populations. Increasing TDS levels has also affected the size and abundance of Tui Chub (*Gila bicolor*), the primary food source for the bigger Lahontan Cutthroat trout.

Since 1987, the mean average temperature of Pyramid Lake and the Truckee River has increased over 2°C. This has led to higher water temperatures, increased levels of Nitrogen, and increased occurrences of cyanobacteria blooms in Pyramid Lake. Testing results from five Pyramid Lake samples collected on July 10, 2020 and July 14, 2020 resulted in Nodularin toxin concentrations from 2,000 ug/L to 10,000 ug/L, which were some of the highest toxin concentrations the contract lab had ever seen. *Nodularia spumigena* (Photo 1) is a heptatoxin which can damage the liver.

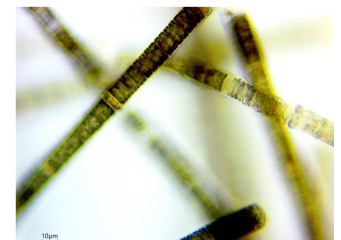


Photo 1: *Nodularia spumigena*

Data obtained from the Western Regional Climate Center (WRCC 2020a) depicts a general warming trend for the Truckee River basin (Truckee Hydrologic Unit Code [HUC] 16050102) dating back to the early 1900s (Figure 3). This warming trend has sharply increased since about 1980, continuing through the baseline period for this consultation. Since 2000, Tribal water quality staff has observed increased abundance of periphyton (filamentous algae) and tolerant benthic macroinvertebrates (planaria, snails, dipterans) during Truckee River sampling events.

For information, visit:

[Pyramid Lake Fishing](#)
pyramidlakefisheries.org

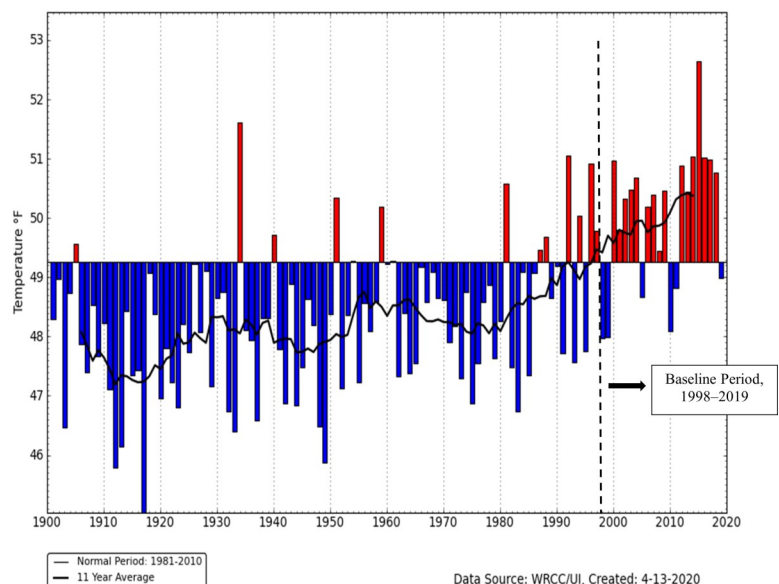


Figure 3: Mean Temperature by Water Year (ending in September) for the Truckee HUC, 1900 – 2019. Data Source: Western Regional Climate Center (WRCC 2020a).

Updates and Announcements

EPA Public Listening Sessions and Roundtables on the Lead and Copper Rule Revisions

The EPA has scheduled two virtual public listening sessions on April 28th and May 5th to obtain further input on the Lead and Copper Rule Revisions (LCRR). During this event, registered members of the public will be provided the opportunity to share their thoughts and concerns about the impact of lead in their community as it relates to the LCRR with EPA senior officials and managers. Those interested in speaking can sign up for a 3-minute speaking slot on EPA's website at: www.epa.gov/safewater.

Members of the public that are unable to attend any of the events will be able to submit comments via the docket at: <http://www.regulations.gov>, Docket ID: EPA-HQ-OW-2021-0255 until June 30, 2021.

For more information, please visit: [Lead and Copper Rule Revisions Virtual Engagements | Ground Water and Drinking Water | US EPA](#)

Tribal Consultation and Public Comment Opportunities

Public Comment Opportunity: Analysis of Subsurface Metabolism in Groundwater Modeling

Ends: June 6, 2021

The U.S. Environmental Protection Agency released its Analysis of Subsurface Metabolism in Groundwater Modeling for public comment. The report evaluates assumptions used in Pesticide in Water Calculator groundwater modeling, which the EPA developed to estimate pesticide concentrations in vulnerable groundwater sources and is used in human dietary risk assessments.

The deadline to submit comments is June 6, 2021. You may submit comments online in docket EPA-HQ-OPP-2021-0241 at www.regulations.gov. For more information on the Pesticide in Water Calculator, please visit: [About Water Exposure Models Used in Pesticide Assessments | Pesticide Science and Assessing Pesticide Risks | US EPA](#)

Tribal Consultation Opportunity: Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Volume 4 Risk Communication

Ends: July 15, 2021

The U.S. Environmental Protection Agency (EPA) is initiating consultation and coordination with federally recognized Indian Tribes and requesting comments on guidance for assessing chemical contaminant data for use in fish advisories, volume 4 risk communication. This guidance provides tribes, states, and territories information on how to develop, implement, and evaluate a risk communication program in order to have clear and effective risk communication methods for fish and shellfish advisories.

The deadline to submit comments is July 15, 2021. The EPA is holding an informational webinar for tribes on April 14, 2021 (2:00 - 4:00 PM EST). To register, click [here](#).

For additional information, please visit <https://tcots.epa.gov> for the consultation materials. To read the guidance, please visit: [Develop Risk Communication Programs for Fish and Shellfish Consumption Advisories | Advisories and Technical Resources for Fish and Shellfish Consumption | US EPA](#)

Grant Opportunities

U.S. EPA Environmental Justice Grants

Deadline: May 7, 2021

The U.S. EPA is accepting applications for Environmental Justice Small Grants and Collaborative Problem-Solving Grant.

Environmental Justice Small Grants Program

This program supports and empowers communities working on solutions to local environmental and public health issues.

Environmental Justice Collaborative Problem-Solving Cooperative Agreement Program

This program provides funding for projects that address local environmental and public health issues within an affected community.

Areas of emphasis include projects focusing on:

- COVID-19 impacts on underserved communities (both)
- Climate/Disaster Resiliency (both)
- Ports Initiative projects (small grants)
- Projects from small non-profits of 10 or fewer employees (small grants)
- New applicants and grantees (both)

Available funding include \$50,000 each for small grants and \$160,000 each for CPS awards. The deadline to submit an application is May 7, 2021. For more information, please visit: [Environmental Justice Grants, Funding and Technical Assistance | Environmental Justice | US EPA](#) or www.grants.gov.



U.S. Fish & Wildlife Tribal Wildlife Grants Program

Deadline: June 18, 2021

The U.S. Fish & Wildlife Tribal Wildlife Grants are used to provide technical and financial assistance to Tribes for the development and implementation of programs that benefit fish and wildlife resources and their habitat. Activities may include but are not limited to: planning for wildlife and habitat conservation, fish and wildlife conservation and management actions, fish and wildlife related laboratory and field research, habitat mapping, habitat preservation, and public education that is relevant to the project.

The deadline to submit an application is June 18, 2021. For more information, please visit: [View Opportunity | GRANTS.GOV](#) or [Fish and Wildlife Service - Native American Liaison \(fws.gov\)](http://www.fws.gov)

Accepting Proposals for the 2021 Tribal Lands and Environment Forum: A Virtual Gathering

 The 2021 Tribal Lands and Environment Forum: A Virtual Gathering is scheduled for August 16-19, 2021. TLEF is now accepting proposals at: <http://bit.ly/TLEFproposal>.
 Topics will be related to primary media, which include, but not limited to, solid/hazardous waste management, brownfields, emergency response, and multi-media subjects. The deadline to submit a proposal is **May 14, 2021**.

Native American Water Association

The Native American Water Association is a non-profit organization that provides tribal water and wastewater operators, managers, utility commissions and tribal leadership with training and technical assistance.

Upcoming training:

- Biological Wastewater Treatment Process Control Made Easy: May 5, 2021 (9:00 AM MST)
- Data Management – Make Your Numbers Relevant, Meaningful, and Useful: May 19, 2021 (9:00 AM MST)
- SBR System Inhibition, Toxicity, and Recovery: June 2, 2021 (9:00 AM MST)

For more information and to register, please visit: [Native American Water Association Events | Eventbrite](#)

Inter Tribal Council of Arizona, Inc. - National Tribal Water & Wastewater Operator Training & Certification Program

The Inter Tribal Council of Arizona, Inc. National Tribal Water and Wastewater Operator Training and Certification Program is providing live online training. Each course consists of sequential lessons that are provided in a series of live online classes that are 3-hours in length.

Upcoming courses include, but are not limited to:

- General Module & Very Small Water System: June 16 to July 19, 2021
- Water Distribution – Level 1: July 19 to August 23, 2021

For more information, training schedule, and to register, please visit: <https://itcaonline.com/programs/environmental-quality-programs/tws-tmap/tws-training-events/>

USGS Climate Adaptation Science Centers (CASC)

The USGS Climate Adaptation Science Center is hosting a webinar on Navigating the Climate Adaptation Science Centers: A National Network of Climate Adaptation Support for Native Nations on April 28, 2021. Tribal resilience liaisons from several CASCs will provide an introduction to the CASC, share examples of cultural resource projects, and how to engage with CASCs for support.

- April 28, 2021 (10:00 AM to 11:00 AM MST). To register: [Registration \(gotowebinar.com\)](#)

EPA Small Systems Monthly Webinar Series

- May 25, 2021: Harmful Algal Blooms and Algal Toxins
- June 29, 2021: Tribal Community Water Systems
- July 27, 2021: Drinking Water Microbes 102

For more information, please visit: <https://www.epa.gov/water-research/small-systems-monthly-webinar-series>

EPA Water Research Webinar Series

- May 26, 2021: Life Cycle Costs of Water Infrastructure Alternatives: New Tools for Stormwater Life Cycle Cost Analysis
- June 30, 2021: Approach to Track Chemical Mixtures in Urban Waters Impacted by Road Salts

For more information, please visit: <https://www.epa.gov/water-research/water-research-webinar-series>

NTWC Members: For more information, visit [Meet the Council](#)

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