

Utah Lake Restoration: Water Quality



August 22, 2017

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Utah Lake Water Quality Study

Purpose

- Sound science informs good policy
- Identify appropriate in-lake nutrient endpoints to protect uses

Funding

- Initial funding of \$1 million from Water Quality Board
- Leverage University of Utah funding of \$1 million
- Potential to leverage POTW research funds

Driving Factors

- Nutrient related 303(d) impairments
- Recent HAB events
- Regulatory certainty

Implementation

- Discharge permits after January 1, 2030
- Utah Nonpoint Source Program



Utah Lake Water Quality

❑ Utah Lake is highly productive with effects on:

- Public health (harmful algal blooms)
- Aquatic life (pH, ammonia)
- Recreation (aesthetics and access)
- Secondary water uses

❑ Shallow lake ecology is different from ecology of deep mountain lakes and reservoirs.

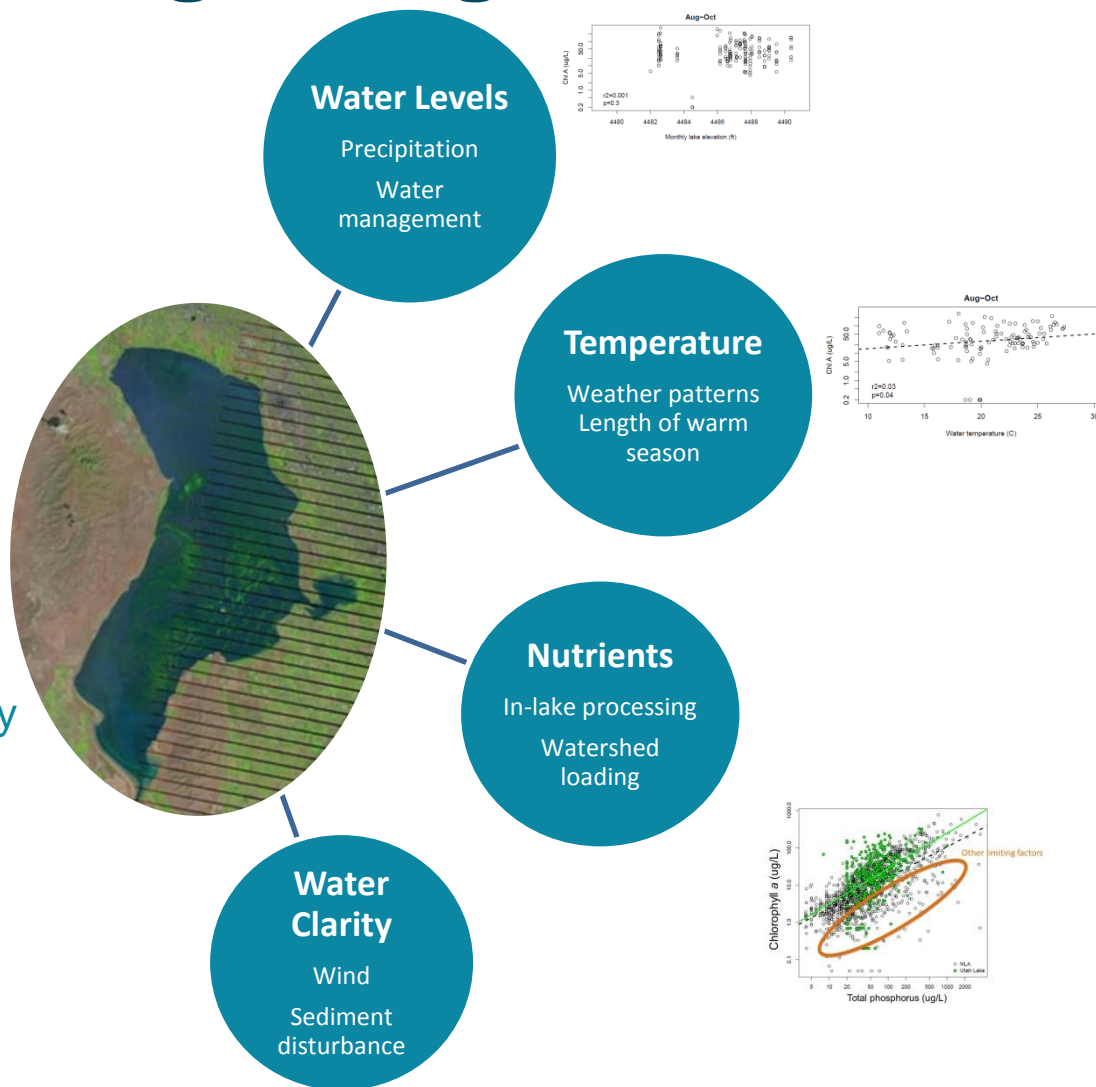
❑ Studies of historic Utah Lake condition indicate a transition from clear lake to the current eutrophic turbid lake in the 20th century.

❑ Understanding nutrient dynamics and the restoration potential of Utah Lake requires site-specific investigation.



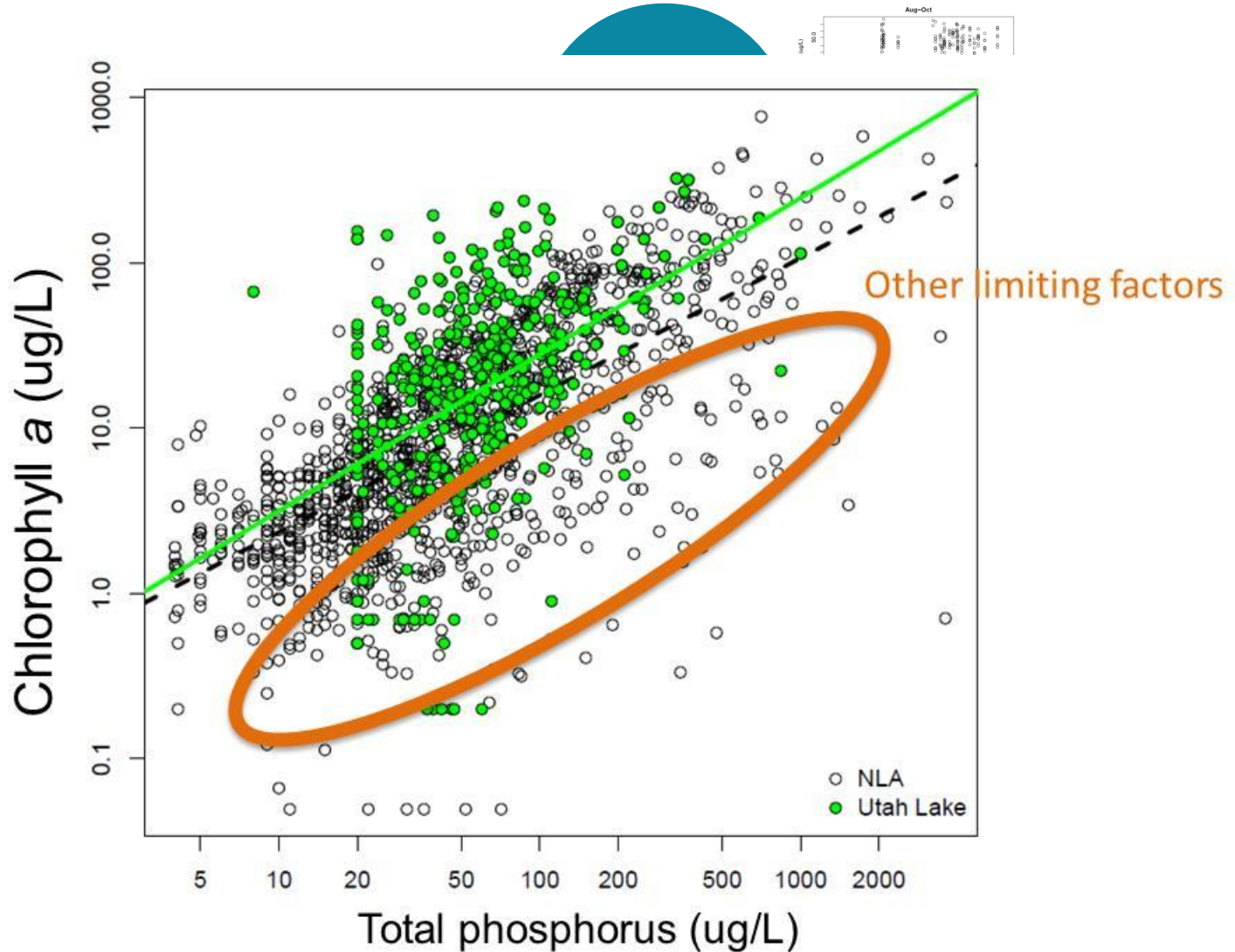
Factors Contributing to Algal Blooms

- Increased nutrient pollution promotes development and persistence of harmful algal blooms
- Large HABs require external sources of nutrients to be sustained
- Reduction of nutrient inputs from watershed sources can significantly reduce HAB frequency and magnitude

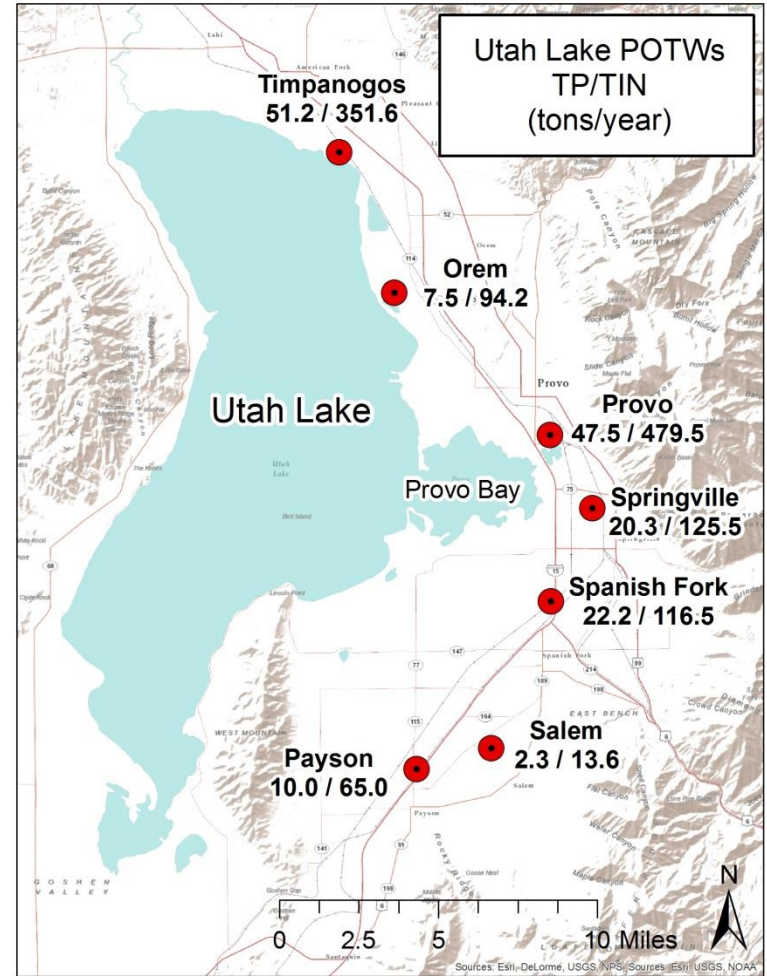
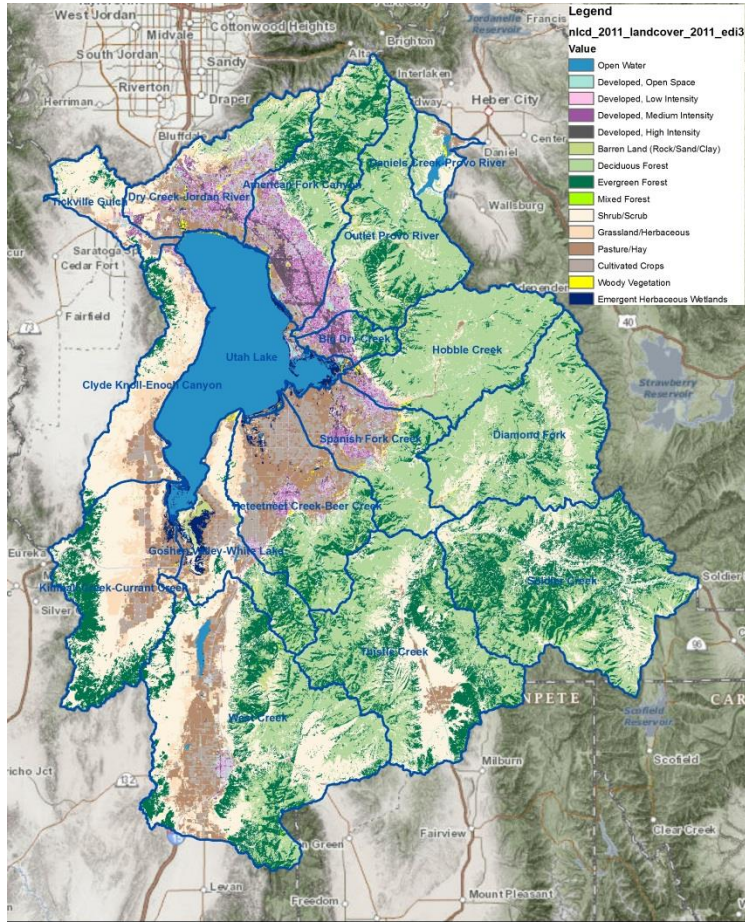


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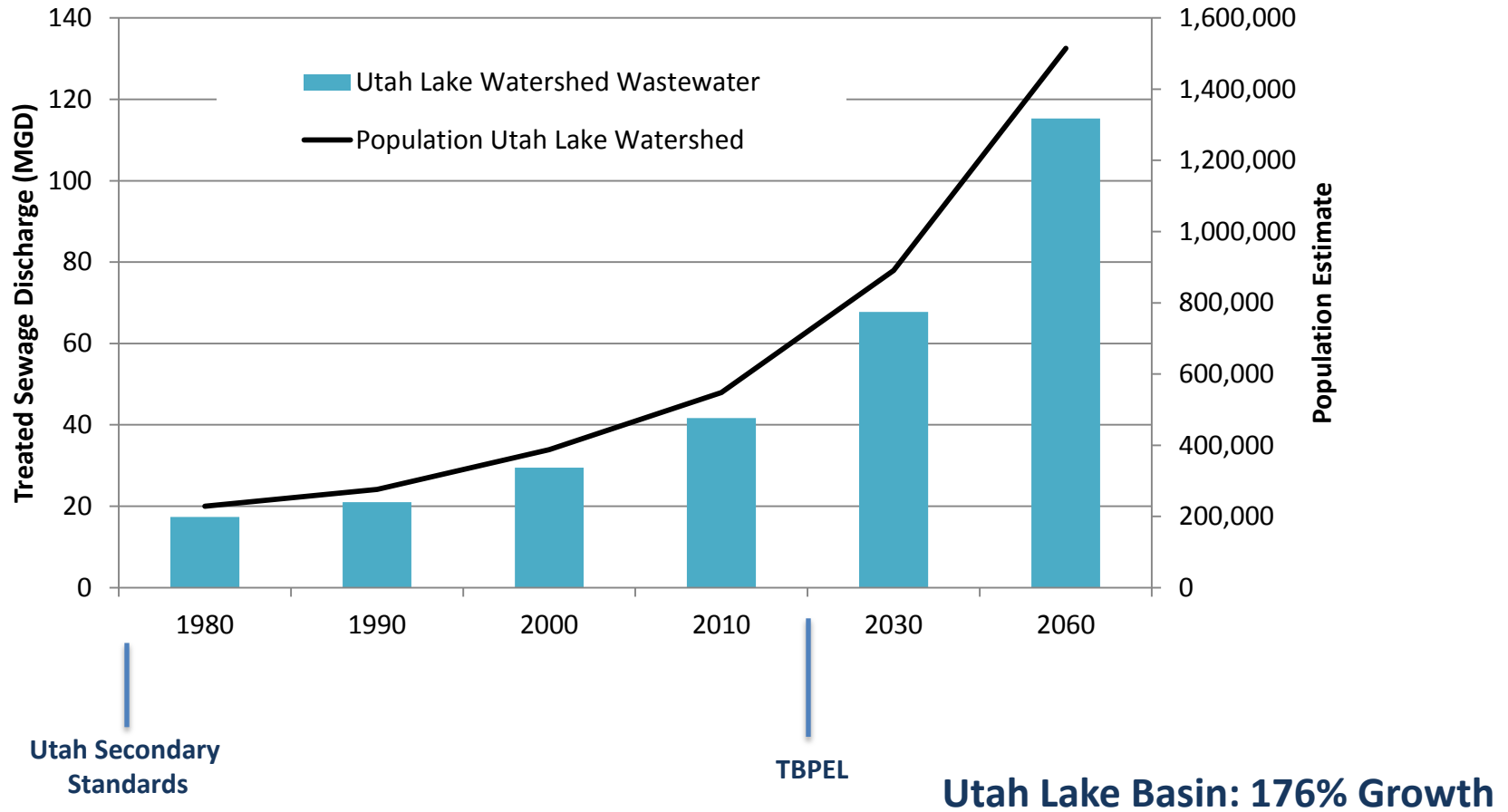
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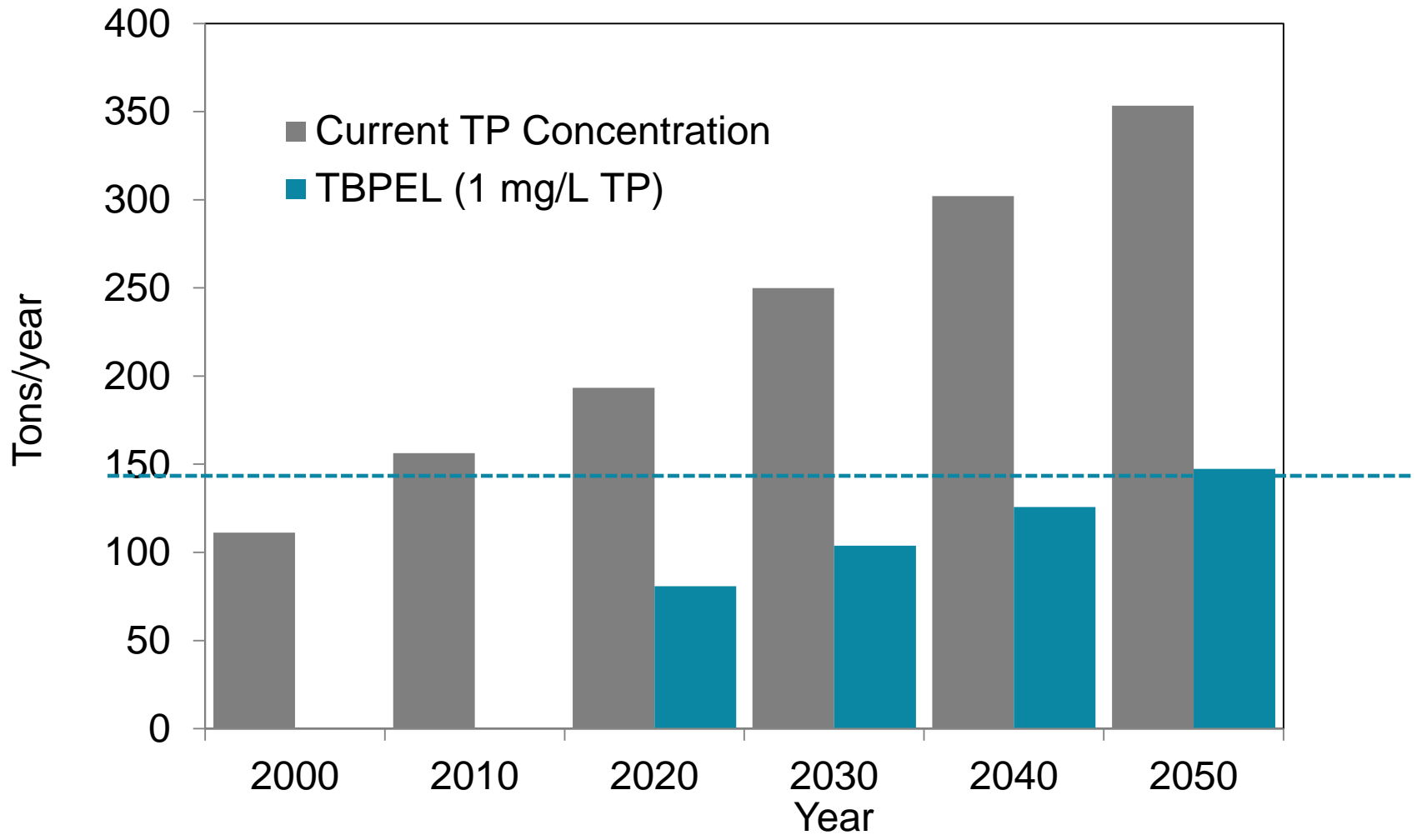
Nutrient Sources



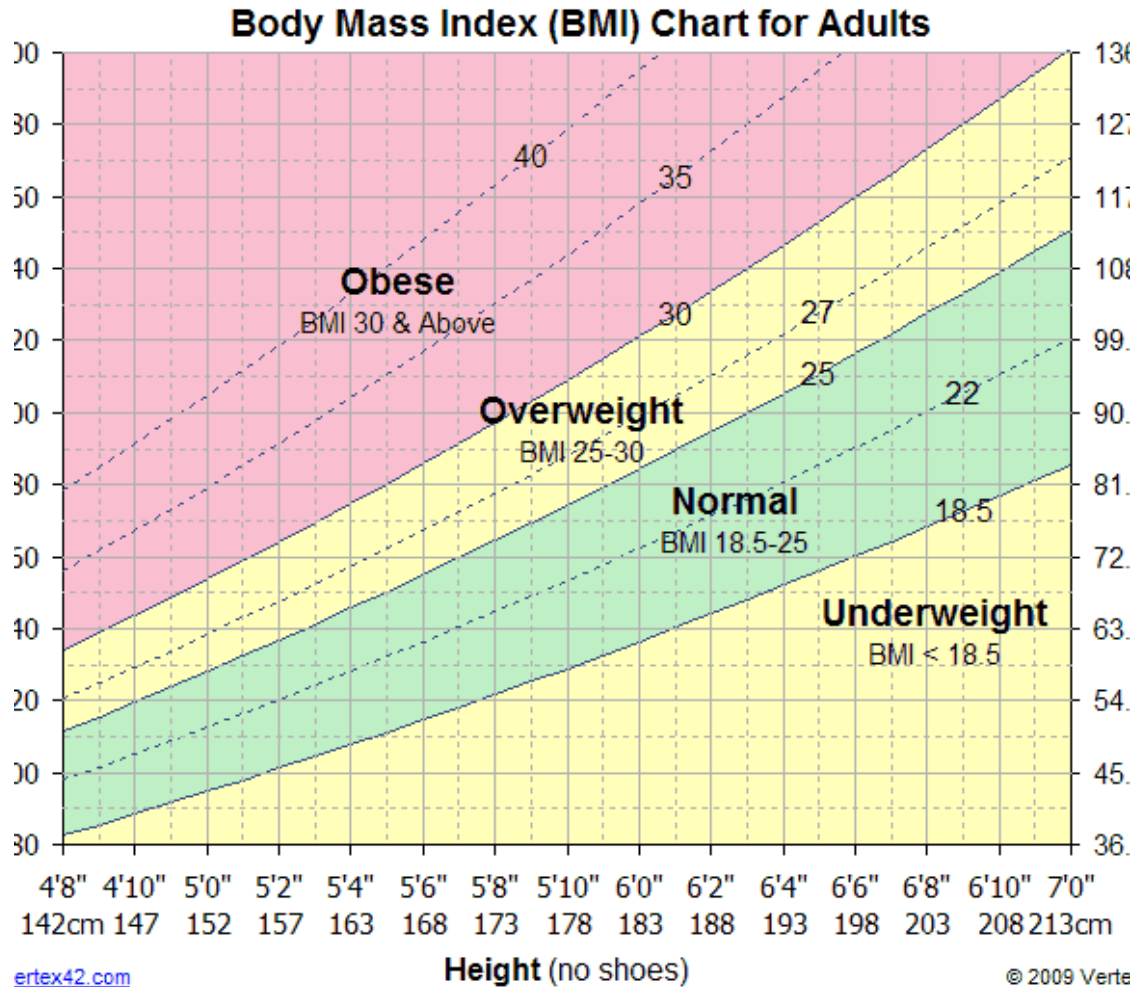
Utah County Population Growth



Utah Lake POTW Projected Phosphorus Loads



Health as a Continuum



Health as a Continuum

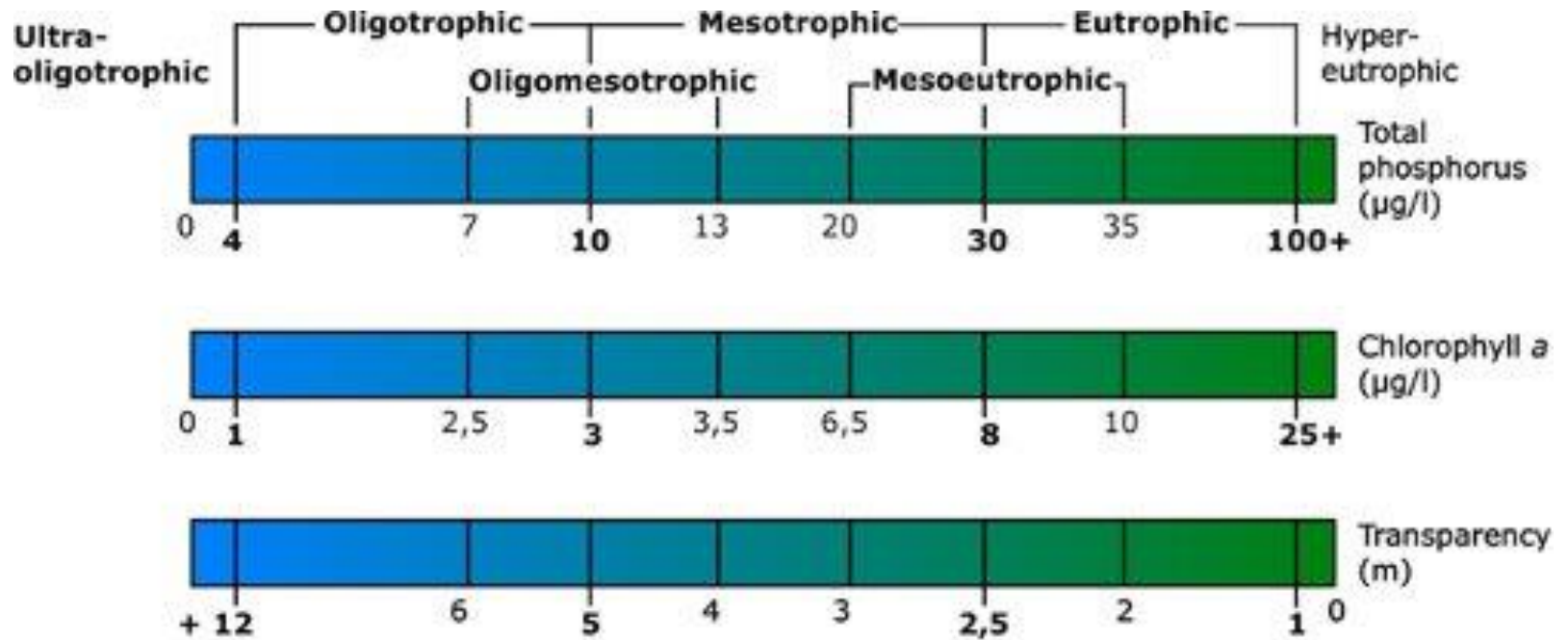


Image source: mddelcc.gouv.qc.ca

Evaluating Tradeoffs

Wastewater Infrastructure

\$4.7 – \$161 million

Storm water systems

Tens of millions \$\$

Nonpoint source reduction

Tens of millions \$\$

Habitat restoration

\$\$\$

Public health

Irritative and potential toxic effects

Aquatic life

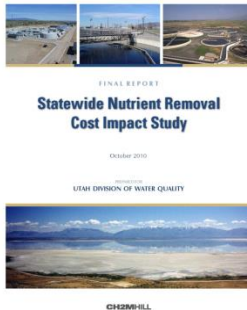
June Sucker and other species

Secondary water

Salt Lake and Utah Counties

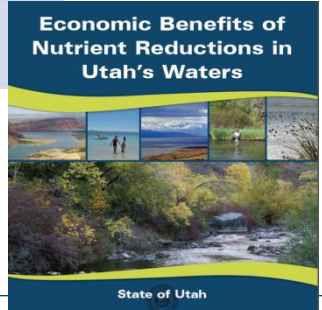
Recreation

492,000 trips/year to Utah Lake
\$1.4 - \$2.4 billion/year state-wide



Costs

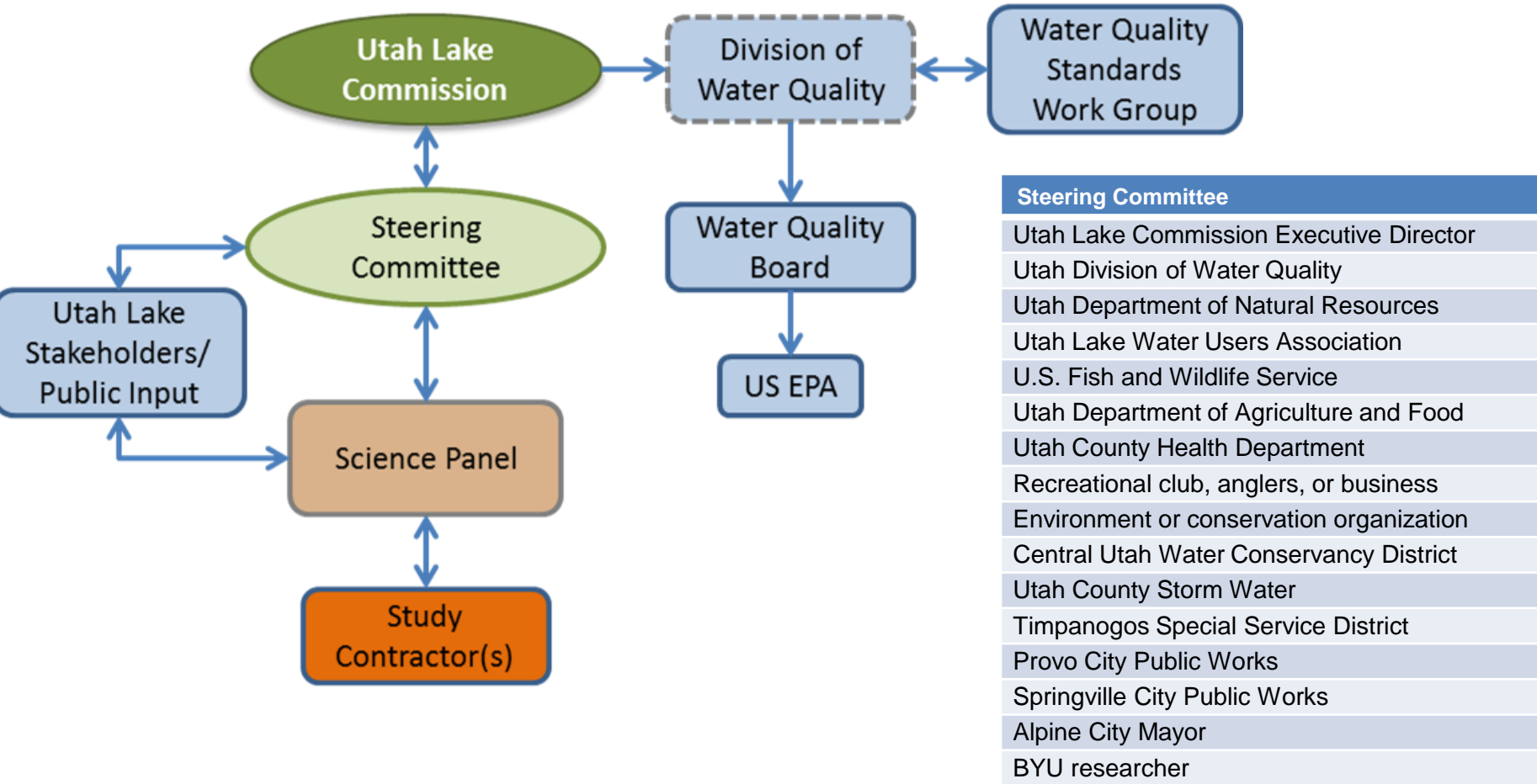
Benefits



Utah Lake Water Quality Study

Purpose:

Develop recommendations for any necessary in-lake water quality criteria that are protective of designated uses and sustain natural resources of Utah Lake



Preliminary Study Topics

Nutrient Dynamics and Use Protection

- Roles of internal lake processes on nutrient cycling and algal blooms
- Appropriate site-specific algal and nutrient targets
- Linkages to aquatic life through ammonia, pH, and oxygen
- Attainability of returning Utah Lake to a “clear” state from a “turbid” condition

Nutrient Loading

- Origin, timing, and magnitude of nutrient loading to Utah Lake
- Linkages with Jordan River and Great Salt Lake

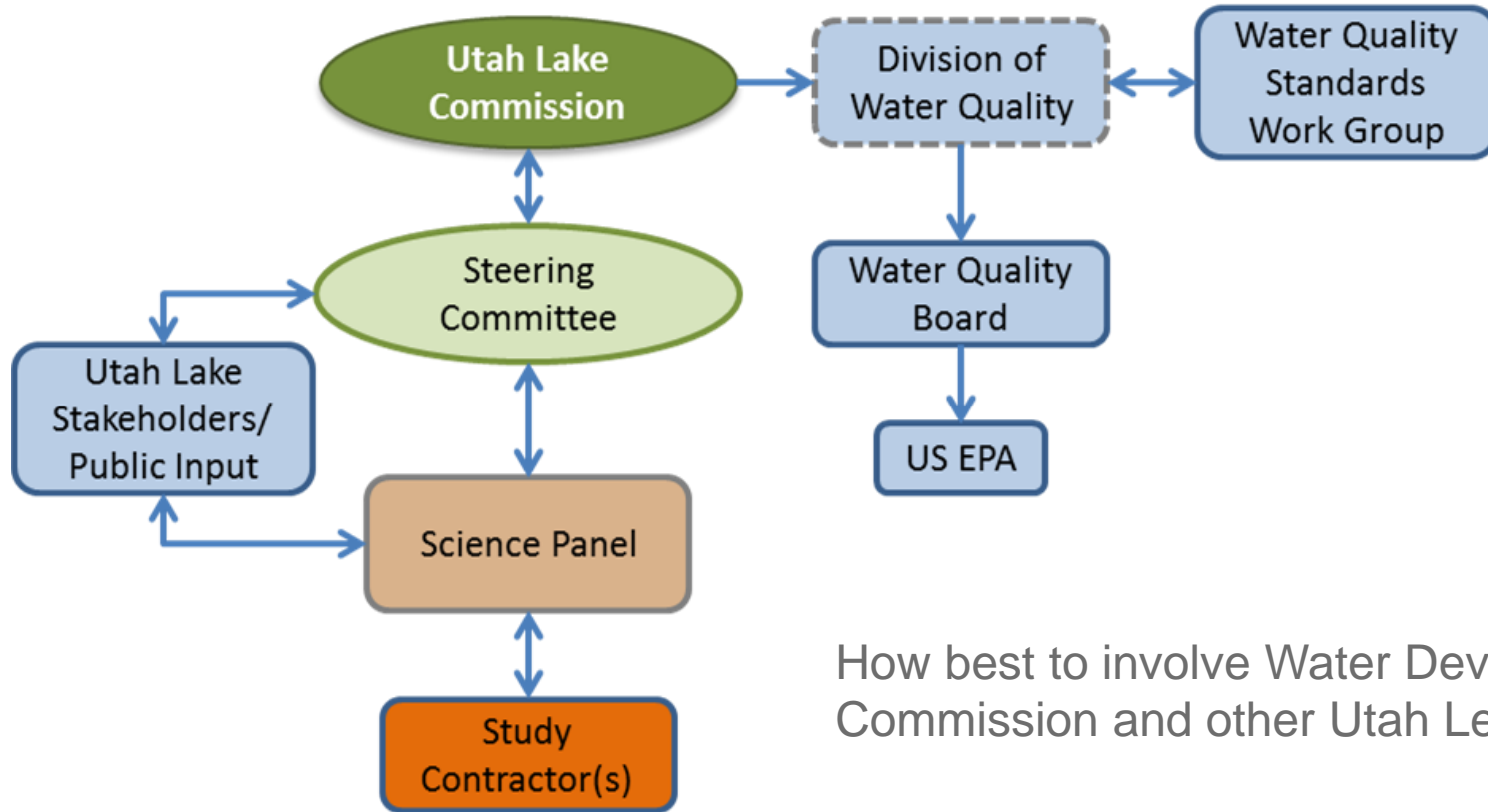
Costs and Benefits

- Costs of nutrient reduction (wastewater, stormwater, and nonpoint sources)
- Economic costs of algal blooms and Harmful Algal Blooms
- Quantify benefits of improved water quality in Utah Lake

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How best to involve Water Development Commission and other Utah Legislators?