Overview of Why We’re Here: Setting the Context

Why does DWQ do what it does?
Utah Water Quality Board

Mission

- Guide the development of water quality policy and regulation in the state.

Members

- Appointed by the governor (consent of senate).
- Makeup is defined by statute (Utah Code Section 19-5-103).
- Represent various interest groups of the water quality community.

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Affiliation</th>
<th>Term Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myron E. Bateman, Chair</td>
<td>360 Kingston Drive, Tooele, Utah 84074</td>
<td>Non-Federal Government, Republican</td>
<td>First Appointed: 05/25/2011, Term Ends: 03/01/2019</td>
</tr>
<tr>
<td>Clyde L. Bunker</td>
<td>1670 N. Jones Road, Delta, Utah 84624</td>
<td>Agriculture and Livestock, Republican</td>
<td>First Appointed: 05/01/2011, Term Ends: 03/01/2019</td>
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<tr>
<td>Steven K. Earley</td>
<td>210 N. 400 E., Centerville, UT 84014</td>
<td>Non Government Organization, Republican</td>
<td>First Appointed: 5/20/2015, Term Ends: 3/01/2019</td>
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<tr>
<td>Gregg Alan Galecki</td>
<td>PO Box 203, Fairview, UT 84629</td>
<td>Mineral Industry, Republican</td>
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<tr>
<td>Jennifer M. Grant</td>
<td>4700 Daybreak Parkway, South Jordan, UT 84095</td>
<td>Manufacturing Industry, Independent</td>
<td>First Appointed: 03/01/2013, Term Ends: 06/21/2021</td>
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<tr>
<td>Michael Luers</td>
<td>2800 Homestead Road, Park City, UT 84098</td>
<td>Special Service Dist., Independent</td>
<td>First Appointed: 5/20/2015, Term Ends: 3/01/2019</td>
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<tr>
<td>Alan Matheson</td>
<td>Department of Environmental Quality, 195 North 1950 West, P.O. Box 144810, Salt Lake City, UT 84114-4810</td>
<td>Executive Director, Department of Environmental Quality, Independent</td>
<td>First Appointed: 03/01/2016, Term Ends: 06/21/2021</td>
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<tr>
<td>David C. Ogden</td>
<td>75 East Center Street, Richfield Ut. 84701</td>
<td>Non-Federal Government</td>
<td>First Appointed: 8/23/2017, Term Ends: 8/31/2021</td>
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<tr>
<td>Jim VanDerslice, PhD</td>
<td>375 University of Utah, Salt Lake City, UT 84108</td>
<td>Non-Federal Government, Independent</td>
<td>First Appointed: 03/01/2016, Term Ends: 06/21/2021</td>
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Utah’s Regulatory Authority to Protect and Restore Water Quality

Clean Water Act Sections 303, 304, 305, and 402 (among others) → Delegated from EPA to State of Utah, DEQ

Utah Water Quality Act (Title 19-5) outlines Powers of Water Quality Board and Director of Division of Water Quality
Statewide Uses Designations (R317-6)

Class 1 -- Protected for use as a raw water source for domestic water systems

Class 2 -- Protected for recreational use and aesthetics.

Class 3 -- Protected for use by aquatic wildlife.

Class 4 -- Protected for agricultural uses including irrigation of crops and stock watering.

Class 5 -- The Great Salt Lake.
Application of Standards (R317-2-7.1)

The numeric criteria listed in R317-2-14 shall apply to each of the classes assigned to waters of the State as specified in R317-2-6.
Narrative Standards R317-2-7.2

“It shall be unlawful, and a violation of these rules, for any person to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum or other nuisances such as color, odor or taste; or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by bioassay or other tests performed in accordance with standard procedures; or determined by biological assessments in Subsection R317-2-7.3.”
Utah’s Nutrient Strategy

“Hold the Line” state-wide on nutrients with Technology Based Phosphorus Effluent Limit of 1 mg/L by 1/1/2020
Utah’s Nutrient Strategy

Headwater Numeric Nutrient Criteria to protect pristine waters
Utah’s Nutrient Strategy

Develop site-specific nutrient standards for major waters
Utah’s Nutrient Strategy

Continue nonpoint source project implementation
...In the Context of Utah Lake
Utah Lake Designated Beneficial Uses

2B: Protected for infrequent primary contact recreation.

3B: Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.

3D: Protected for waterfowl, shore birds and other water-oriented wildlife, including the necessary aquatic organisms in their food chain.

4: Protected for agricultural uses including irrigation of crops and stock watering.

Utah Lake is NOT designated as Class 1C (Source of domestic drinking water)
Downstream Water Use
Utah Lake Water Quality Timeline

2002 303(d) Impairments (TP)
  • 2004-2008 TMDL Initiative
    • Loading Estimates for WWTP, tribs, and misc. sources

2008 Utah Statewide Nutrient Strategy
  • TBPEL - 2015
  • Headwater criteria – in progress
  • Site specific investigation for high priority waters

Utah Lake Harmful Algal Blooms (HABs)
  • 2014 - HAB near Lindon Marina
  • 2015/2016 - HAB Guidance Document
Utah Lake Water Quality Timeline

2016 303(d) Impairments
- Harmful Algal Blooms
- pH – Provo Bay
- Ammonia – Provo Bay

Utah Lake Water Quality Study
- Initiated in November 2015
  - Phase 1 work plan elements
- November 2016 – Initiated Stakeholder Process development
# Utah Lake Impairment Listings

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**Utah Lake Uses**

2B: Protected for infrequent primary contact recreation.

3B: Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.

3D: Protected for waterfowl, shore birds and other water-oriented wildlife, including the necessary aquatic organisms in their food chain.

4: Protected for agricultural uses including irrigation of crops and stock watering.
Utah Lake Water Quality Study Phase I
Utah Lake Water Quality Study

Purpose
• Evaluate the role of excess nutrients on designated use impairments
• Identify appropriate in-lake nutrient endpoints

Driving Factors
• Nutrient related 303(d) impairments
• Continuation of previous studies
• Recent HAB events
• Regulatory certainty

Funding
• $1 million from Water Quality Board

Implementation
• Discharge permits after January 1, 2030
• Utah Nonpoint Source Program
Phase 1 Work Elements

Task 1 – Stakeholder Development

Task 2 – Data and information management

Task 3 – Designated Use Assessment

Task 4 – Source and nutrient load analysis

Task 5 – Model Selection and Development
Utah Lake Stakeholder Involvement

Utah Lake Water Quality Stakeholder Group
• Tiered from Utah Lake Commission TAC
• 100+ representatives:
  • Local municipalities and Utilities
  • POTWs
  • Local Universities
  • Private Consulting
  • Advocacy Groups
  • State, local and federal government

Water Quality Subgroups
• Data and Information Management (Task 2)
• Beneficial Use Assessment (Task 3)
• Load Analysis (Task 4)
• Model Selection and Development (Task 5)
Project Status: Data and information management (Task 2)

Coordination of monitoring activities
- DWQ Monitoring Activities
- Partner monitoring/research

Data compilation and database development
- Share data
- Populate Database
- Circulate Database

Literature Review and synthesis
Beneficial Use Assessment (Task 3)

Beneficial use assessment
- Update Integrated Report with recent data as appropriate

Baseline data characterization
- Data completeness
- Analysis of trophic related parameters
- Data gap analysis
Source and Nutrient Load Analysis (Task 4)

Water budget

Bulk load analysis

Refine load estimates

- Spring and storm runoff
- Dry weather and base flow
- Seasonal distribution
- Nonpoint source loading

Metadata Characterization

- Watershed loading data evaluation
- Source identification/characterization
- Water budget evaluation
- Monitoring strategy
Model Selection and Development (Task 5)

Model Selection Process
- Stakeholder subgroup
- Evaluate model options

Model Selection
- Model selection report

Model Development
- University of Utah

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Introduction to ULWQS Phase II (and III)
Utah Lake Water Quality Study

Phase 2: 2018-2020

- **Formalize Stakeholder Process**
  - Steering Committee
  - Science Panel

- **Research Priorities**:
  - To Support Water Quality Modeling
  - Nutrient Cycling
  - Ecological Response

- **Model Development**
  - Sensitivity Analysis
  - Calibration/Validation Report
  - Nutrient Scenarios

- **Establish Utah Lake Numeric Nutrient Criteria**

- **Alternative:** Use Attainability Analysis
- **Alternative:** Delisting
- **Alternative:** Utah Lake TMDL

- **Non Point LAs**
- **Permit Limits**
  - POTWs
  - Storm water
  - Industry

Phase 3: 2020-2030

- **NPS Implementation**

**Research Priorities:**

- To Support Water Quality Modeling
- Nutrient Cycling
- Ecological Response

**Model Development:**

- Sensitivity Analysis
- Calibration/Validation Report
- Nutrient Scenarios

**Establish Utah Lake Numeric Nutrient Criteria**
Preliminary Study Questions

Nutrient Dynamics
- How are nutrients linked to algal blooms, dissolved oxygen, ammonia, and other water quality concerns in Utah Lake?
- What are the roles of internal lake processes, weather, and water management on nutrient cycling and algal blooms?

Loading Characteristics
- What is the origin, timing, and magnitude of nutrient loading to Utah Lake?
- How do nutrient loads to Utah Lake translate into downstream effects in the Jordan River and Great Salt Lake?

Recreation Use Survey
- What is the desired condition for recreational users?

Costs and Benefits
- How much will it cost for Utah County communities to reduce nutrients from wastewater, stormwater, and agricultural runoff?
- What are the economic and social costs of Harmful Algal Blooms?
- What are the benefits of improved water quality in Utah Lake to the fishery, recreational users, water users, and community development?
Overview of ULWQS Stakeholder Process
Stakeholder Process

Stakeholder Group
- Utah Lake Commission Technical Committee
- 100+ representatives:
  - Local municipalities, POTWs, universities, consultants, advocacy groups, water users, recreationists, government.
- Water quality subgroups for technical direction

Challenges
- Very large committee
- Stakeholders Under or unfairly represented
- Lack of common understanding of goals/endpoints
- Conflict resolution
- Limited/ineffective collaboration
- Consensus-based decision making
Division of Water Quality

• Steering Committee Co-chair
• Provide for meeting facilitation
• Staff administrative & technical support
• Approval of Steering Committee and Science Panel charters
• Facilitate recommendations to WQB

Utah Lake Commission

• Steering Committee Co-chair
• Forward recommendations to WQB

Utah Water Quality Board

• Consider recommendations from Steering Committee, ULC, and DWQ
• Adopt water quality criteria
Process Structure

Utah Lake Commission

Steering Committee

Science Panel

Study Contractor(s)

Utah Lake Stakeholders/Public Input

Division of Water Quality

Water Quality Standards Work Group

Water Quality Board

US EPA
# Steering Committee Membership

<table>
<thead>
<tr>
<th>Stakeholder Interest</th>
<th>Affiliation</th>
<th>Representative</th>
<th>Alternate</th>
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<tbody>
<tr>
<td>Utah Lake Commission (Co-chair)</td>
<td>Utah Lake Commission Executive Director</td>
<td>Eric Ellis</td>
<td>Sam Braegger</td>
</tr>
<tr>
<td>Water quality</td>
<td>Utah Div. of Water Quality</td>
<td>Erica Gaddis</td>
<td>Jim Harris</td>
</tr>
<tr>
<td>Recreation, fishing, and sovereign lands</td>
<td>Utah Department of Natural Resources</td>
<td>Chris Keleher</td>
<td>Laura Ault</td>
</tr>
<tr>
<td>Agriculture/ water rights/ water users</td>
<td>Utah Lake Water Users Association</td>
<td>Jesse Stewart</td>
<td>Jon Hilbert</td>
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<tr>
<td>Fish and wildlife</td>
<td>U.S. Fish and Wildlife Service</td>
<td>George Weekley</td>
<td>Chris Cline</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Utah Conservation Commission Zone 3, Utah Department of Agriculture and Food, or local agricultural interest</td>
<td>Jay Olsen (UDAF)</td>
<td>Daniel Gunnel (UDAF/Conservation Commission Zone 3)</td>
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<tr>
<td>Public health</td>
<td>Utah County Health Department</td>
<td>Jason Garrett</td>
<td>Craig Bostock</td>
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<tr>
<td>Recreation</td>
<td>Recreational club, anglers, hunters, or business</td>
<td>Garrett Smith (Utah Lake Water Ski Association)</td>
<td>Todd Fry (Bonneville Sailing Club)</td>
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<td>Conservation and environment</td>
<td>Environment or conservation organization</td>
<td>Heidi Hoven (Audubon Society)</td>
<td>Ella Sorensen (Audubon Society)</td>
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<td>Water management of Utah Lake</td>
<td>Central Utah Water Conservancy District or appropriate water manager</td>
<td>Gerard Yates (CUWCD)</td>
<td>Mike Rau (CUWCD)</td>
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<td>Stormwater</td>
<td>Utah County</td>
<td>Jay Montgomery (Utah County Stormwater Association)</td>
<td>Travis Taylor (Utah County)</td>
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<td>Publicly Owned Treatment Works</td>
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<td>David Barlow (Timp. SSD)</td>
<td>David Land (Timp. SSD)</td>
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<td>Gary Calder (Provo City)</td>
<td>Cory Pierce (Spanish Fork City)</td>
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<td>Academia</td>
<td>University researcher</td>
<td>Dennis Shiozawa (BYU)</td>
<td>Nancy Mesner (USU)</td>
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Steering Committee

Purpose: Guide development of in-lake water quality criteria that are protective of designated uses and sustain natural resources of Utah Lake

Objectives/Duties

- Partnerships among stakeholders
  - Consensus based approach
  - Promote collaboration among stakeholders
  - Access to scientific and policy expertise
  - Coordinate funding sources
- Establish science panel
Steering Committee

Purpose: Guide development of in-lake water quality criteria that are protective of designated uses and sustain natural resources of Utah Lake

Objectives/Duties

• Develop goals and objectives
• Acknowledge uncertainty
• Recommendation to Commission and WQB
Stakeholder Facilitation

Situation Assessment
• Assess stakeholder dynamics
• Build trust among stakeholders
• Identify critical issues and challenges
• Opportunities for mutual gain
• Identify potential obstacles

Meeting Facilitation
• Steering Committee
• Science Panel
• Science Panel/contractor interactions

Stakeholder Facilitation
• Coordination of internal and external stakeholders
• Public engagement
Objectives and Duties of the Science Panel
Science Panel

Purpose:
Guide water quality criteria development by overseeing targeted scientific study

Objectives/Duties
• Develop scientifically defensible approach
• Identify gaps in scientific expertise and understanding
• Recommend study objectives to Steering Committee
• Develop strategic research program
• Develop process for independent peer review
• Develop guidance for treatment of uncertainty
• Recommend water quality criteria to Steering Committee
Science Panel

Objectives/Duties

• Recommend and prioritize studies
• Develop study methods
• Guide Scientific research
  • Define study objectives
  • Review and approve study work plans
  • Direct PI’s and study contractors
  • Review and participate in data collection efforts
  • Interpret and report results
• Collaborate with related research programs
# Science Panel Membership

<table>
<thead>
<tr>
<th>Representative</th>
<th>Affiliation</th>
<th>Primary Discipline</th>
<th>Aquatic ecology</th>
<th>Biogeochemistry</th>
<th>Fisheries management</th>
<th>Hydrodynamic modeling/hydrology</th>
<th>Nutrient cycling</th>
<th>Limnology</th>
<th>Toxicology</th>
<th>Water quality criteria</th>
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<td>Michael Brett</td>
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Independent (Voting)

Ex Officio (Non-Voting)
Discussion

utahlake.deq.utah.gov

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