What's New in Utah's 2010 *Integrated Report*?

## Revisions to Assessment Method Documentation

In response to stakeholder comments on previous reports, DWQ has rewritten and reformatted the water quality assessment methods to provide additional clarity on the methods that are used to assess Utah's surface waters. Among other things, these revisions provide additional clarity on how DWQ uses sources of outside data and information when making water quality assessments.   This document identifies changes to the assessment methodologies. Unless noted in this document, the assessment methods are the same as for previous *Integrated Reports*.

New Methods for Assessing Recreation Uses

DWQ recently developed new monitoring methods that allow *E. coli* concentrations to be used to assess Recreation and Domestic (Drinking Water) designated uses. The 2010 report describes the analytical methods and results from the first samples evaluated under this new program.

A New Listing Based on Mercury Fish Tissue Concentrations

All waterbodies with fish consumption advisories are listed in Part 2 of the 2010 IR. Two lakes were listed as impaired for 2010, Newcastle Reservoir for mercury and Utah Lake for PCBs.
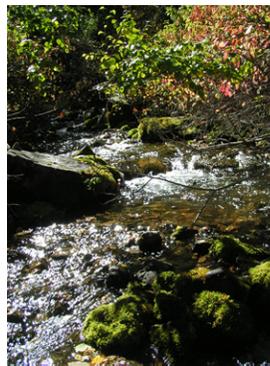
Updated Biological Assessment Method

In 2008, DWQ introduced procedures that can be used to quantify the biological integrity of Utah's streams and rivers. These models represented an important development because they allow DWQ to directly quantify support of aquatic life uses. In 2010, these methods have been further refined as follows:

Utah is the second driest state in the nation, which makes protecting the health of our rivers and streams especially important. DWQ assesses support of the health of these ecosystems so that we can assure that these resources continue to provide Utah's citizens with vital economic and environmental services. The results of these assessments are published every other year in the Integrated Report.

- o New Models have been created to incorporate recently sampled reference sites.
- o New—more statistically rigorous— methods were developed for determining impairment thresholds.
- o Further clarification is provided on how to make a final assessment decision when chemical and biological assessment results differ. These new methods more closely mirror EPA's guidance on

"independent applicability", which suggest that States should error on the side of environmental protection, declaring impairment if any reliable water quality indicator suggests impairment.

Updated Assessment Methods for Lakes and Reservoirs

The biggest change in this reporting cycle for lake assessments was the methodology for calculating Carlson's Trophic Status Index (TSI). For previous assessments, the TSI was averaged from measurements of chlorophyll-a, secchi disk, and total phosphorus.   For 2010 the TSI was based on chlorophyll-a only to be consistent with the recommendations of Carlson (1997). For 2010, TSI's were calculated and compared using both the "old" and "new" methods.

Other changes include:

o   Categories 3B and 3C (insufficient data) were swapped to correctly describe how these categories have been implemented.   The 2008 IR did not accurately describe how these categories were applied. Category 3B is applied when a parameter is not supporting for a lake for one assessment cycle. Category 3C is applied when the data is insufficient to determine support and DWQ will develop an assessment methodology.

o   Removed the text discussing two different TDS standards for stock watering and irrigation because only one standard exists following recent standards changes.

o   Clarified that the temperature data is evaluated for each sampling date.

o   Added text to identify that the DO assessment methods are being re-evaluated.

o   Added text to clarify that any conclusions based on a lens approach will be clearly explained.

Photo Credit: *Fractured Earth*, by Charles Uibel

o   Deleted the requirement that only DO data from the fall was used for determining support status.

Updates to the Great Salt Lake Appendix

Great Salt Lake is a unique ecosystem with different biological organisms than those used to create numeric water quality criteria for fresh water beneficial uses.   Also, there are no comparable reference sites (similar lakes with minimal human-caused perturbations) so traditional assessment methods do not apply. DWQ is devoting as many resources as possible to develop water quality programs for this vital ecosystem. The 2008 *Integrated Report* included an appendix that outlines a process from developing an assessment tool for the lake. In 2010 the report includes an appendix that provides an update on the development of water quality programs for the lake. Highlights of this appendix include a preliminary

evaluation of mercury and its impacts on aquatic life, and a preliminary model—a Multi-Metric Index—that will ultimately allow DWQ to assess the impounded wetlands that surround the lake.

Changes to Assessment Units

Assessment Units (AUs) are watersheds that have been delineated for assessment purposes. Assessments made at a location are assumed to apply to all stream segments. Sometimes, DWQ finds evidence that some water segments are physically or ecologically distinct, which requires that these watersheds be "split" into smaller, more homogenous segments. The following table provides a list of AUs that were divided into smaller watersheds for the since the first draft of the 2008 IR:

Previous AU Name	New AU Name	Rationale
Summit Creek	Summit Creek Lower and Upper	AU split at diversion that affects water quality and quantity
High Creek	High Creek Upper and Lower	AU split at diversion that affects water quality and quantity

Waterbodies Added to the 303(d) List of Impaired Waters

The following table contains AUs that appear on the 303(d) list for the first time in 2010:

AU Name	Cause
CottonwoodWash	Benthic Macroinvertebrate Impairment
Westwater Creek	Benthic Macroinvertebrate Impairment
Pack Creek	Selenium
Strawberry River-1	Boron
Willow Creek	Benthic Macroinvertebrate Impairment
Price River-3	Benthic Macroinvertebrate Impairment
Upper Quitchupah Creek	Benthic Macroinvertebrate Impairment
Lower Quitchupah Creek	Benthic Macroinvertebrate Impairment
Johnson Creek	Temperature
CombWash	Benthic Macroinvertebrate Impairment
North Fork Virgin-2	E. coli
North Fork Virgin-1	Temperature
Virgin River-1	Boron
Sage Creek	Temperature
Big Creek	Temperature
North Creek	Temperature
Summit Creek-Lower	Temperature
South Fork Little Bear	Temperature
Silver Creek	Total Dissolved Solids
Provo River-4	E. coli
Main Creek-1	Temperature, E. coli
Provo Deer Creek	E. coli
Snake Creek-1	E. coli
Jordan River-1	E. coli

AU Name	Cause
Jordan River-4	Benthic Macroinvertebrate Impairment
City Creek-2	Cadmium
Parley Canyon Creek-1	E. coli
Pinto Creek	Benthic Macroinvertebrate Impairment
East Fork Sevier-3	Benthic Macroinvertebrate Impairment
Sevier River-20	Benthic Macroinvertebrate Impairment
Parowan Creek	Benthic Macroinvertebrate Impairment
Calder Reservoir	Temperature
Red Fleet Reservoir	Temperature
Big SandWash Reservoir	Temperature, Dissolved Oxygen
Starvation Reservoir	Temperature
Lower Bowns Reservoir	Temperature, Dissolved Oxygen
Wide Hollow Reservoir	Temperature, Dissolved Oxygen
Recapture Reservoir	Temperature
Echo Reservoir	Temperature
Rockport Reservoir	Temperature
UtahLake	PCBs in Fish Tissue
NavajoLake	pH
Piute Reservoir	Temperature
Koosharem Reservoir	Temperature
Newcastle Reservoir	Mercury in Fish Tissue, Temperature

Waterbodies Removed from the 303(d) List of Impaired Waters

The following table contains waters that were removed from the 303(d) list in the 2010 reporting cycle:

AU Name	Rationale
Matt Warner Reservoir	TMDL approved
Brough Reservoir	TMDL approved
Calder Reservoir	TMDL approved
Steinaker Reservoir	TMDL approved
Red Fleet Reservoir	TMDL approved
Newcastle Reservoir	TMDL approved
Unita River-1	TMDL approved and meeting TDS Standard
Lake Fork-1	TMDL approved and meeting TDS Standard
Deep Creek	TMDL approved and meeting TDS Standard
Huntington Creek-2	TMDL approved and meeting TDS Standard
Paria River-3	Meeting TDS Standard