



Development of Water Quality Standards for Willard Spur

Steering Committee Update

Willard Spur Steering
Committee

August 16, 2011

Monday, August 15, 2011

- **Field tour**



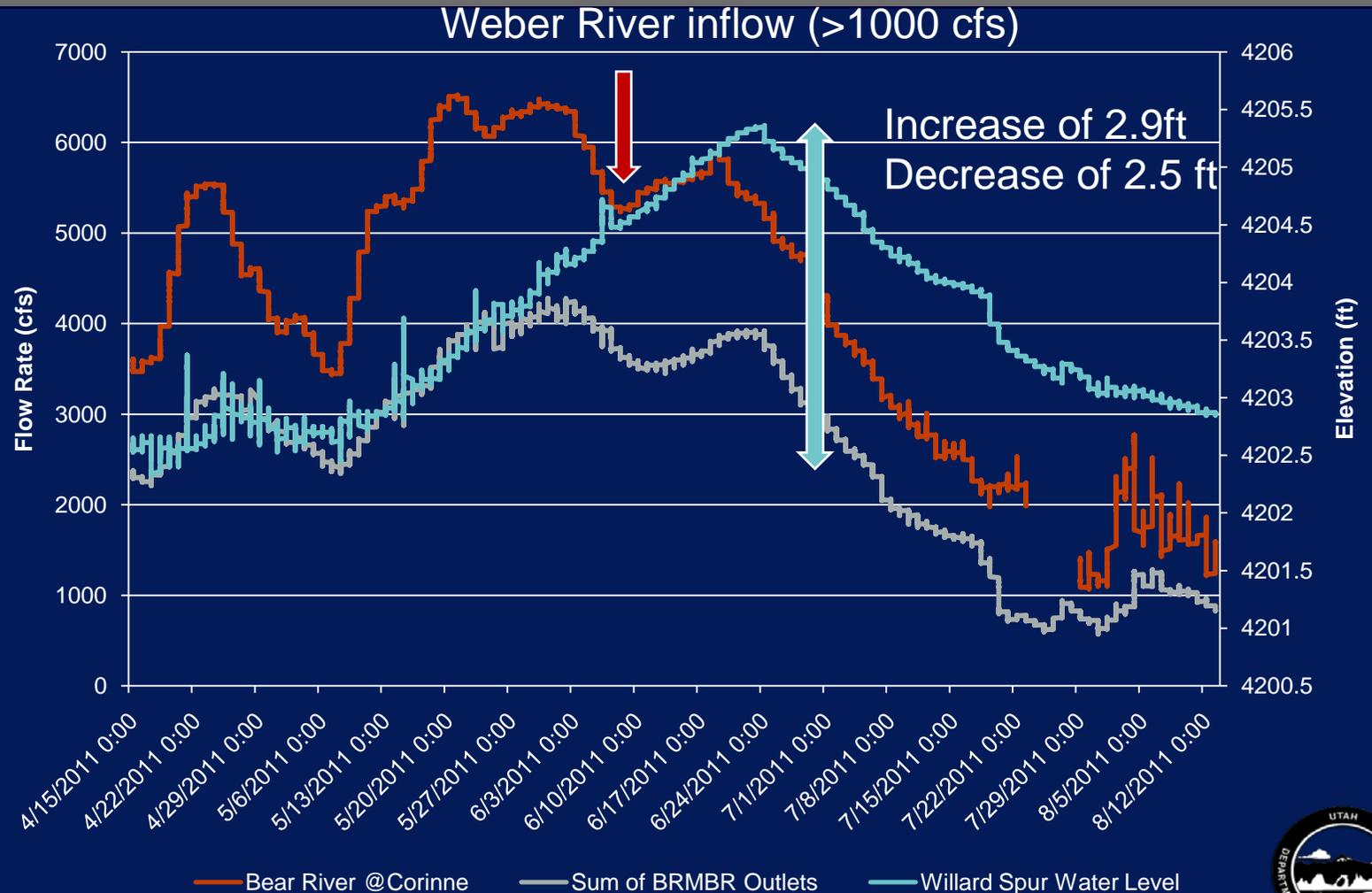


Monday, August 15, 2011

- **Reviewed background**
 - See memo
- **Reviewed objectives and approach**
- **Reviewed sampling program**
 - Methods, challenges, path forward
- **Discussed Willard Spur Dynamics**
- **Discussed data and format**



Inflow from Tributaries

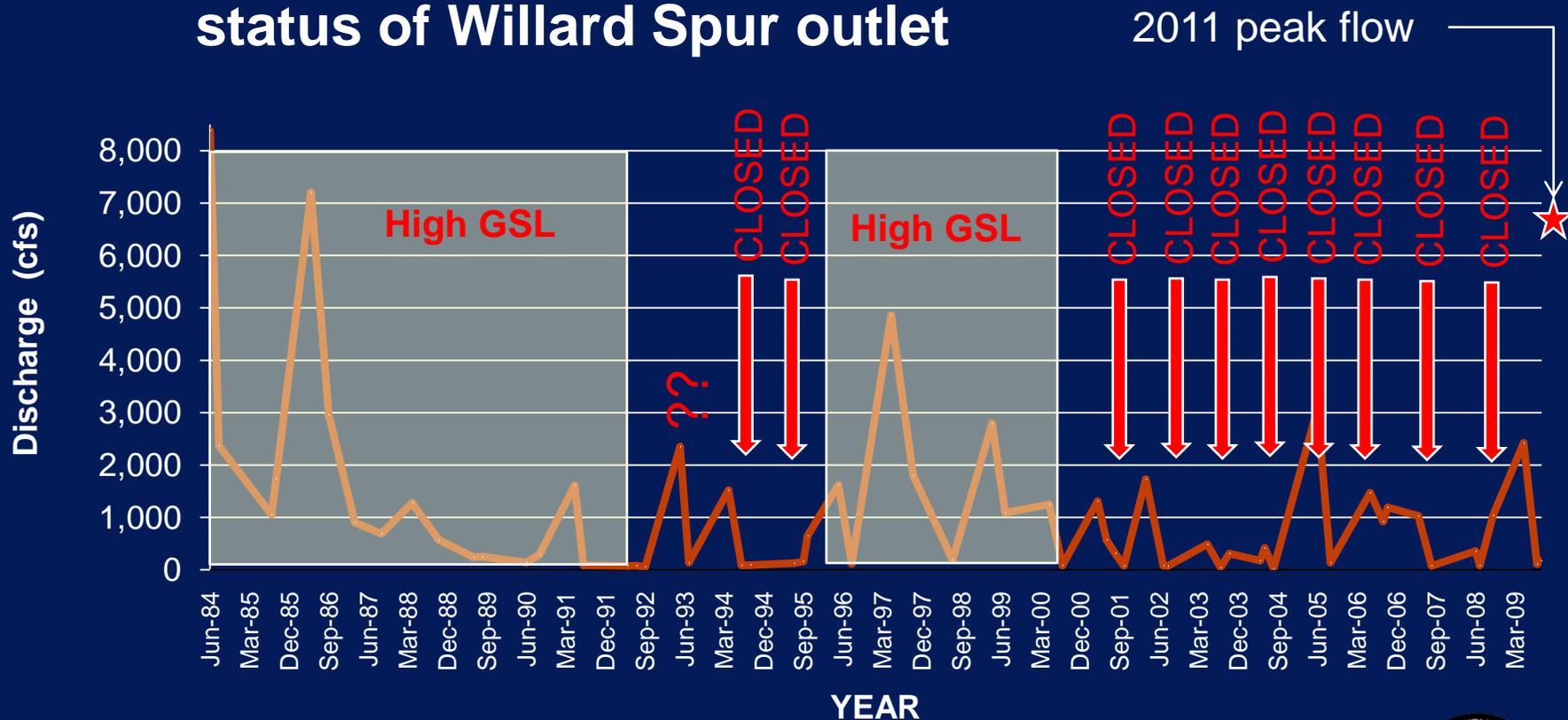


Source: <http://waterdata.usgs.gov/nwis>



Open or Closed Condition

- Bear River flows vs. status of Willard Spur outlet



Source: <http://waterdata.usgs.gov/nwis>
USGS 10126000 BEAR RIVER NEAR CORINNE, UT
Outlet status from satellite imagery





Tuesday, August 16

- **Objective:**
 - What water quality standards are appropriately protective of beneficial uses of Willard Spur waters **as they relate to the proposed POTW discharge?**
- **Working Hypothesis for Critical Condition**
 - Outfall reaches open water, open water is closed off from Bear River Bay





Conceptual Models

- **Objective**

- Link the pressures that create stressors to the responses that may impact the beneficial uses
- Visualize these relationships from the cause to the impacted use





Tuesday, August 16

- **Pressure/Cause – PWRWTP discharge**
- **Stressors – Nutrients, changed hydrology on mudflat**
- **Responses – macroalgae, phragmites**

Simplified Nutrient Conceptual Model

Nutrient Load

Primary Response

Altered Algal Community

Increased Organic Decomposition

Secondary Response

Decreased SAV Density and Cover

Decreased Light Availability

Low Dissolved Oxygen

Impacts to Beneficial Uses

Loss of Habitat
Birds, Fisheries, Recreation

Altered Food Web
Birds, Fisheries, Recreation

Poor Water Quality

Recreation



Simplified Hydrology Conceptual Model

Continuous Flows

Primary
Response

Wet soils

Increased
Vegetation

Secondary
Response

Loss of
beneficial
vegetation due
to invasives

Habitat for
Predators

Impacts to
Beneficial Uses

Loss of Habitat
Birds,
Fisheries,
Recreation

Altered Food Web
Birds,
Fisheries,
Recreation

Poor Water
Quality

Recreation





Tuesday, August 16

- **Beneficial Use Impacts**
 - Bird use and food web
 - Food web: fish, plants, macroinvertebrates



Studies

- Water budget
- Nutrient budget
 - *Sediment/water exchange*
 - *Nutrients/macroalgae*
 - *Nutrient limitation*
 - *Sediment burial*
- Food budget
- Bird diet & carrying capacity
- Fish species/population

modeling



Path Forward

- **Upcoming Science Panel meetings**
 - September 22, 2011
 - October 6, 2011
 - November 3, 2011
 - January 12, 2012

