



Development of Water Quality Standards for Willard Spur

Willard Spur Science Panel

October 30, 2013

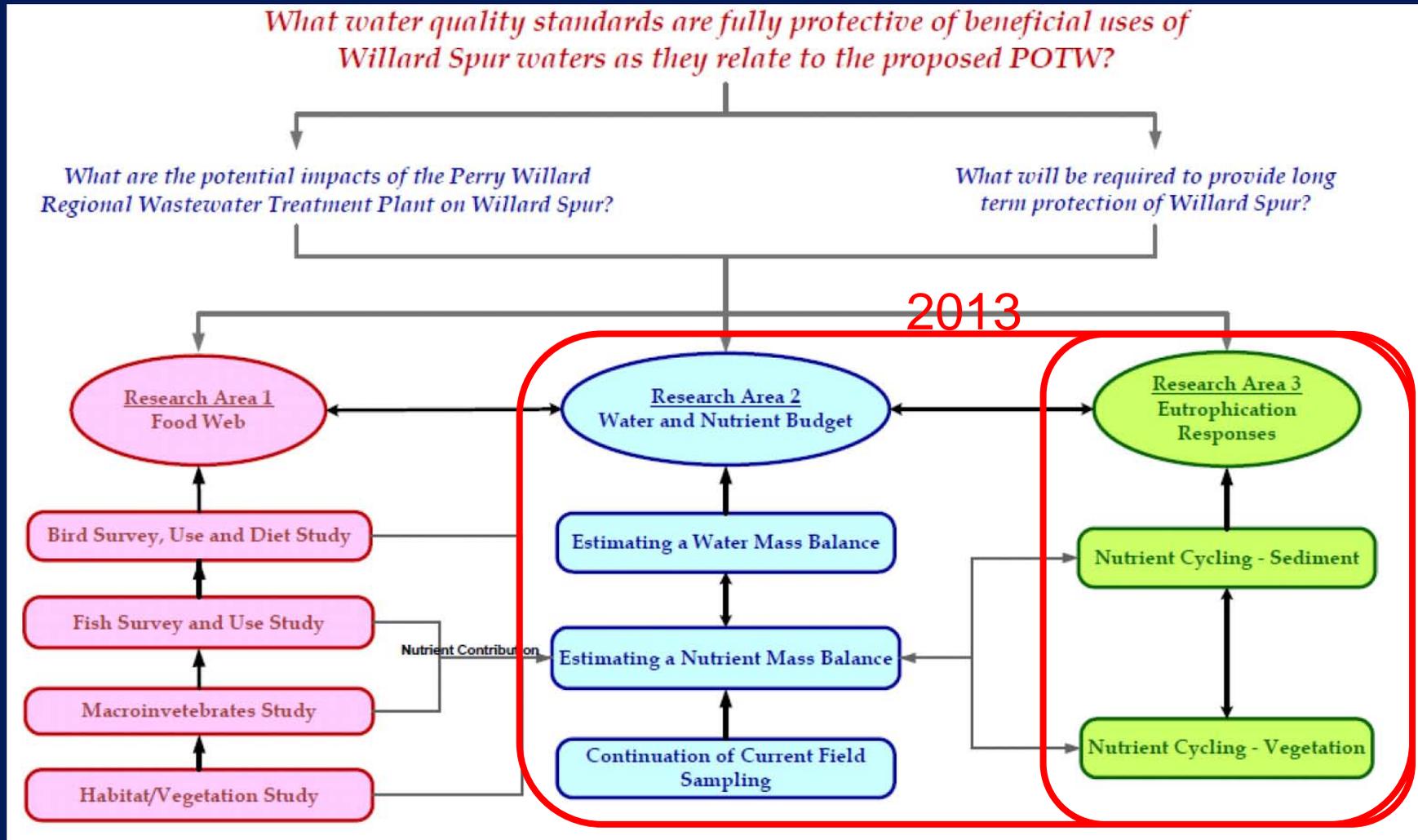


Today's Objective

- **Review current understanding of Nutrient Cycling research to:**
 1. Understand observations and preliminary conclusions
 2. Look for links between efforts
 3. Provide feedback to PIs for final reports



Research Plan for 2013



Looking at historic and current changes due to nutrients

Looking at potential future changes due to nutrients

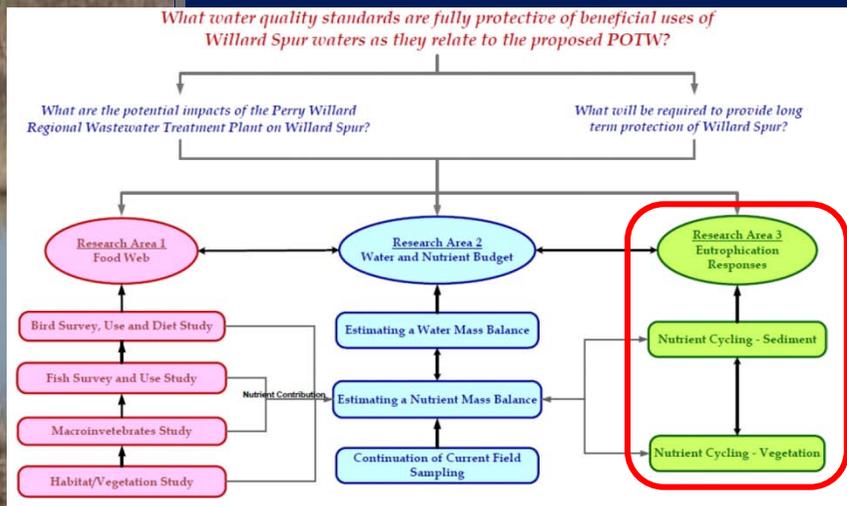
Key questions for all GSL wetlands

UofU Test Plots

UofU Microcosms

DWQ Mesocosms

- How does Willard Spur respond to nutrients?
- What are the assimilation rates for nutrients?
- Where do the nutrients go?





Review of Key Questions

Willard Spur Nutrient Cycling Study

1. What natural changes occur in WS wetlands?
2. What factors drive those changes?
3. How do differences in nutrient conditions drive changes?
4. How does natural variability relate to nutrient cycling?
5. What constitutes a negative response to nutrients?
6. What is a potential trigger that can be used for monitoring?





Review of Key Questions

Willard Spur Mesocosm Study

1. What is the nutrient uptake rate in WS?
2. To what extent do macrophytes/epiphytes influence uptake rates?
3. Do uptake rates differ temporally (June vs Aug)?
4. What is the influence of macrophytes on rates of GPP and ER?



9/29/2003
1993 2011

Field Conditions 2013

Note: GoogleEarth image is from 2003

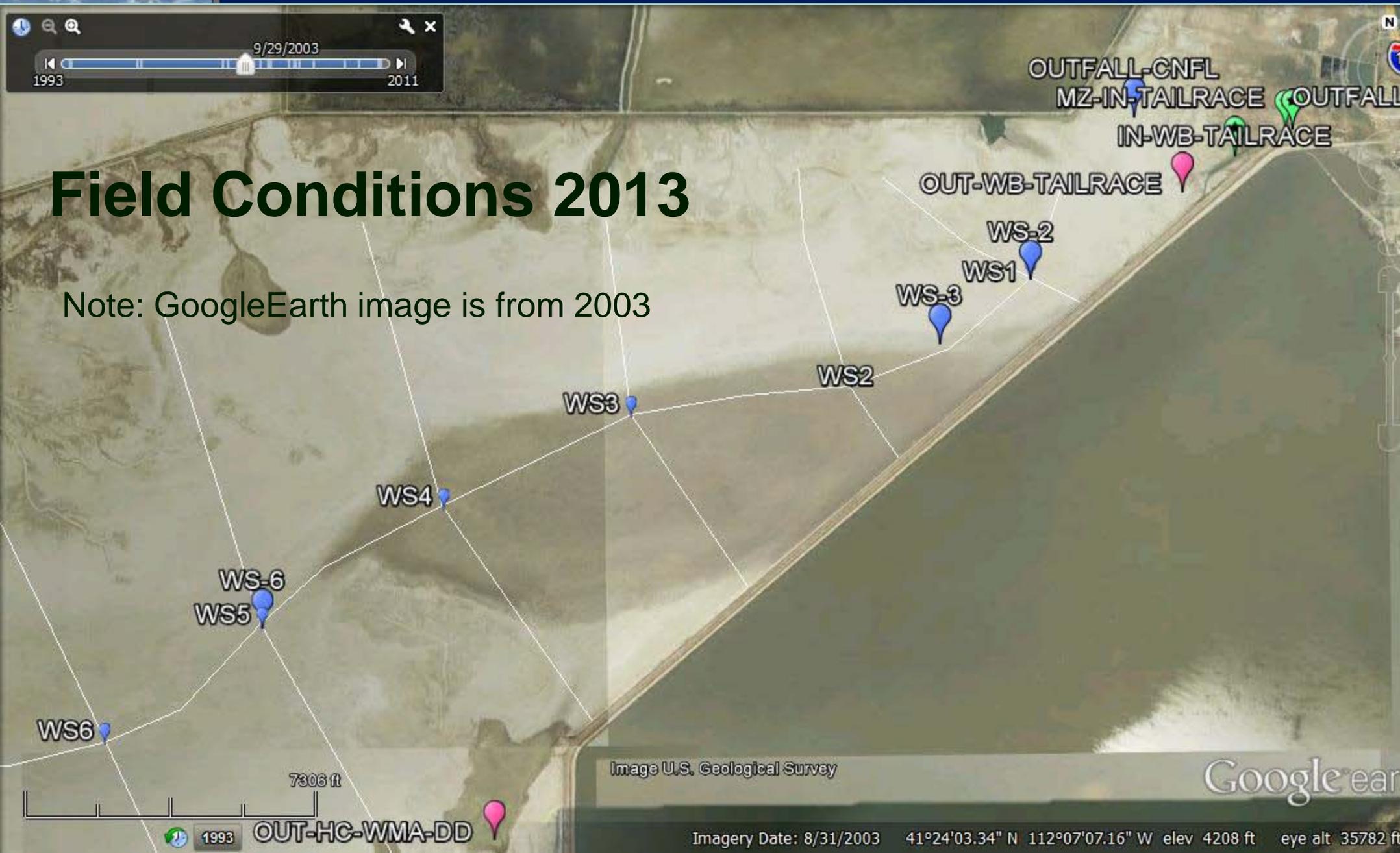


Image U.S. Geological Survey

Google earth

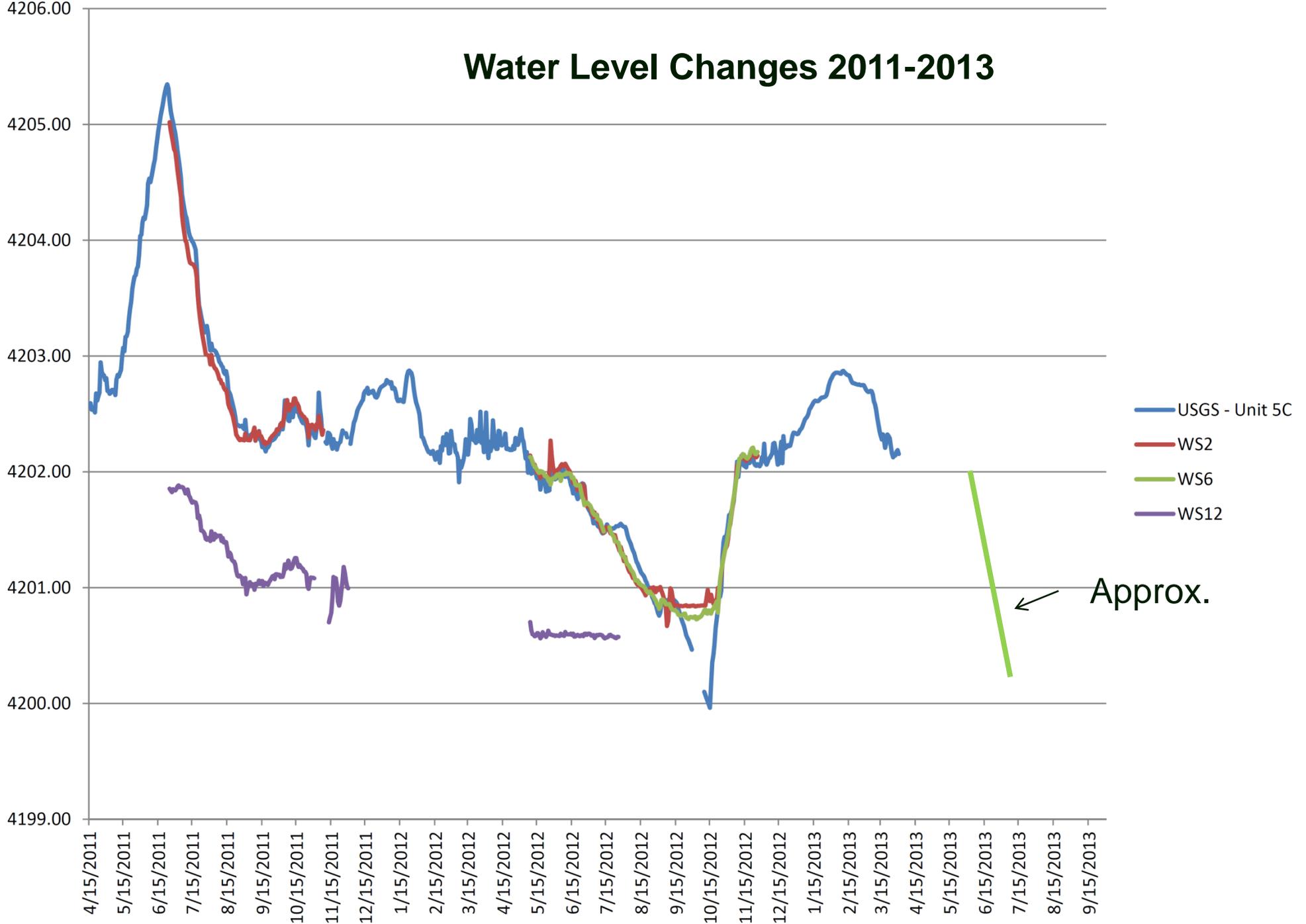
Imagery Date: 8/31/2003 41°24'03.34" N 112°07'07.16" W elev 4208 ft eye alt 35782 ft

Update on Field Conditions

Conditions only became drier since our last meeting on August 29, 2013



Water Level Changes 2011-2013



Looking E-SE

Willard Bay

Flow From
BRMBR



Aerial photos courtesy John
Luft/UDWR

Date taken: August 19, 2013



Looking S-SE

HCWMA

GSLM

Flow from
BRMBR

August 19, 2013



Looking W-SW

Willard
Bay

HCWMA

GSLM

August 19, 2013





- **Conditions on October 10, 2013**





- **Conditions on October 10, 2013**



Water from BRR-6
@ BRMBR

Water from Harold
Crane WMA

Water along
toe of Willard
Bay

Willard Spur
Open Water

BRMBR

Willard
Bay

Outlet Channel

Plant Outfall Pipeline

August 19, 2013





- **Conditions on October 10, 2013**

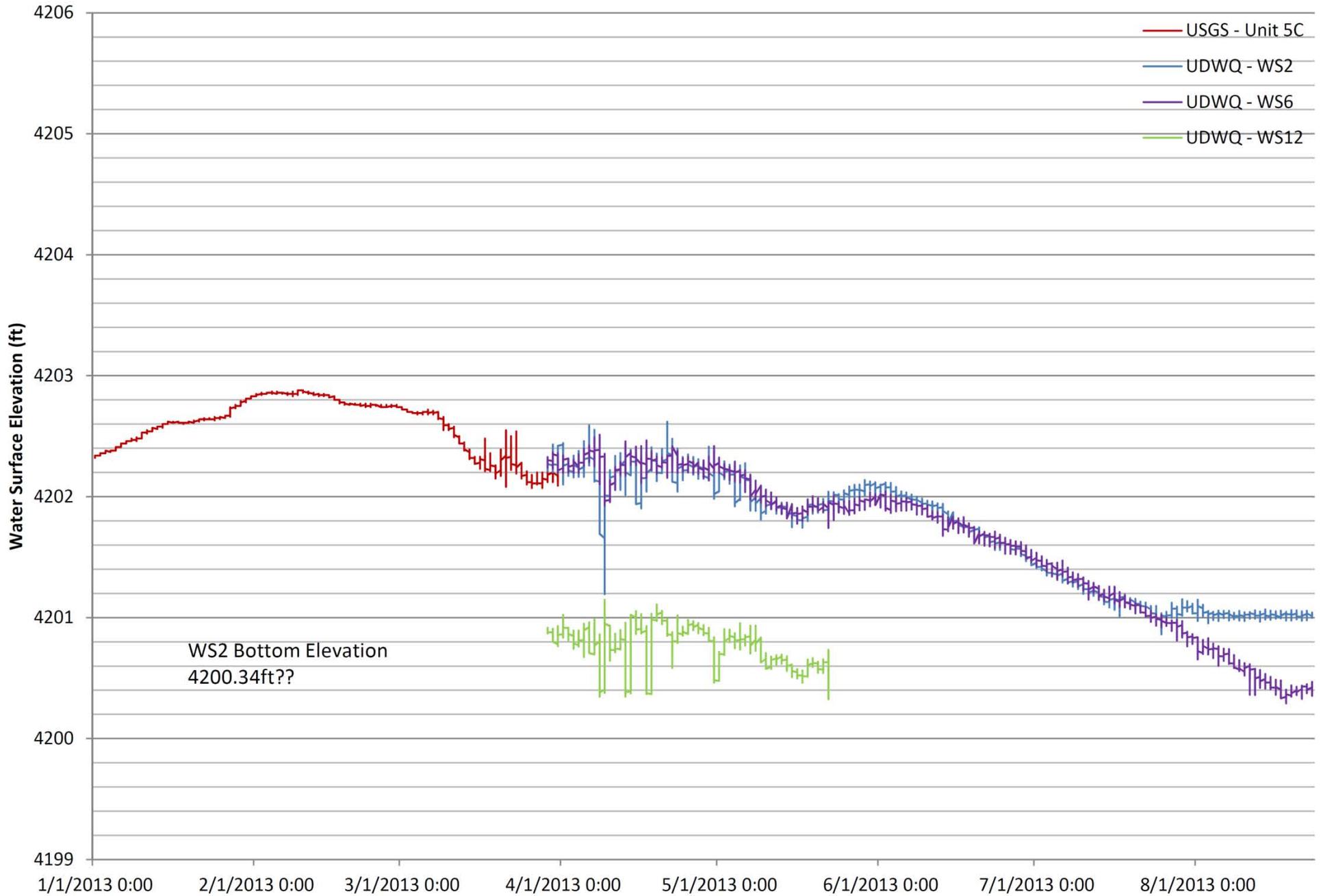


No water from BRR11/BRMBR

Water from tailrace is evaporating

Water at toe of Willard Bay

2013 Willard Spur Water Levels



Next Steps in the Field

- One more month of sampling
- Bed load samplers



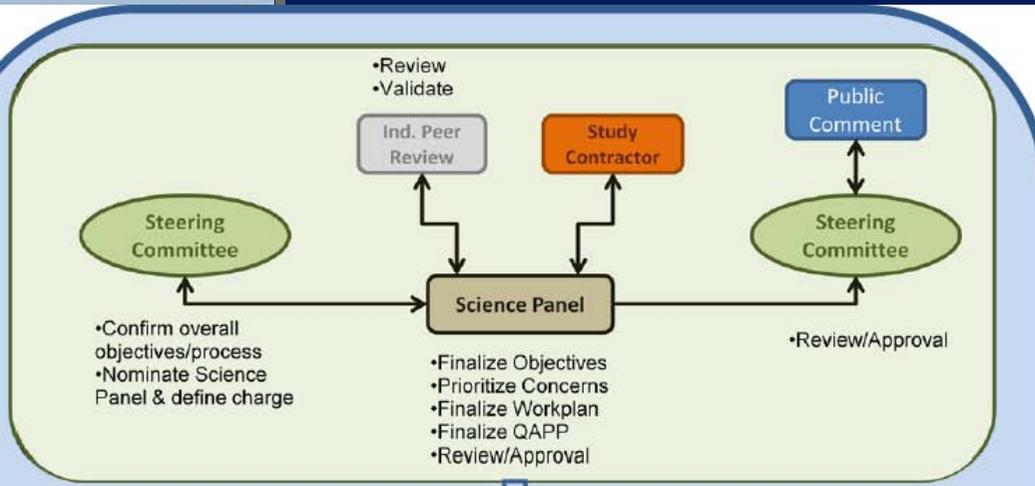
Remnants of SAV/algae near
HCWMA



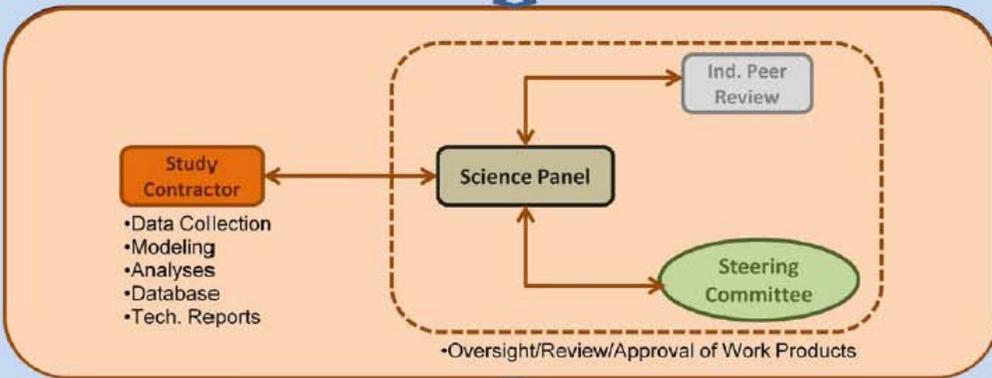
Questions?

Path to Completion 2011

Plan Formulation



2012-2013 Research & Evaluation



2014

Reporting & Recommendations



DWQ Input & Oversight
Throughout Process

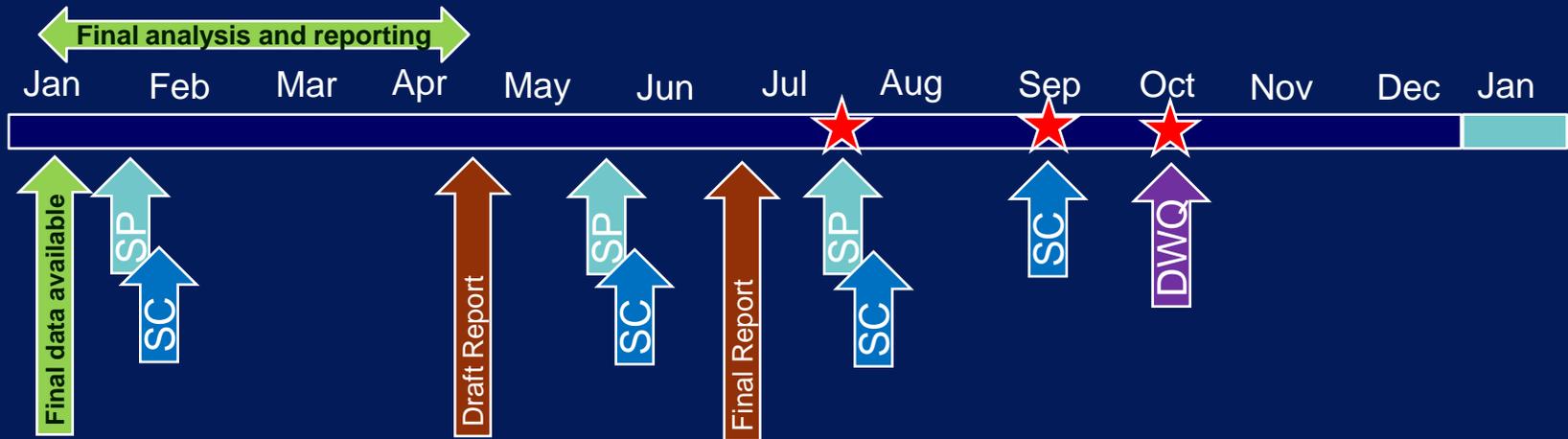


Schedule of Deliverables

	Description	Data	Draft	Final
	2012 Research Studies			
→	Final reports		30-Dec-12	30-Jul-13
	Database			
→	2011-2012 Database			30-Jun-13
	2011-2013 Database		28-Feb-14	30-Jun-14
	2013 Research Plan			
	Plant Impacts	31-Jan-14	30-Mar-14	30-Jun-14
	Nutrient Cycling Study	30-Sep-13	30-Nov-13	28-Jan-14
	Open Water Studies	30-Oct-13	3-Jan-14	28-Feb-14
	Final Reporting			
	2011-2013 Hydrology	31-Jan-14	30-Mar-14	
	2011-2013 Nutrient Loads	31-Jan-14	30-Mar-14	
	Nutrient Cycling Study		30-Apr-14	30-Jun-14
	Final Reporting		30-Apr-14	30-Jun-14



Path Toward Completion - 2014



-  Science Panel meeting
-  Steering Committee Meeting
-  Final Recommendation

Next meeting?

Calendar for October 2013 (United States)

October						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Questions?

