



# Development of Water Quality Standards for Willard Spur

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## Willard Spur Science Panel

January 29, 2014



# Today's Objectives

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- **Understand the significance** of nutrient cycling processes in Willard Spur:
  1. How do we define the nutrient cycle?
  2. What factors most influence nutrient cycling and uptake?
  3. How do we define a “natural” response in Willard Spur?
  4. Will added nutrients change this?



# Today's Objectives

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- **Understand the significance** of nutrient cycling processes in Willard Spur
- **Assuming we do not understand all of the details, what are the significant drivers and risks to Willard Spur from nutrients?**



What impact does the Plant have?





# Today's Agenda

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- 1. Review of program objectives**
- 2. Review of overall changes that have been observed**
- 3. Review of Nutrient Cycling Study results**
- 4. Review of uptake experiments**





# Tomorrow's Objectives

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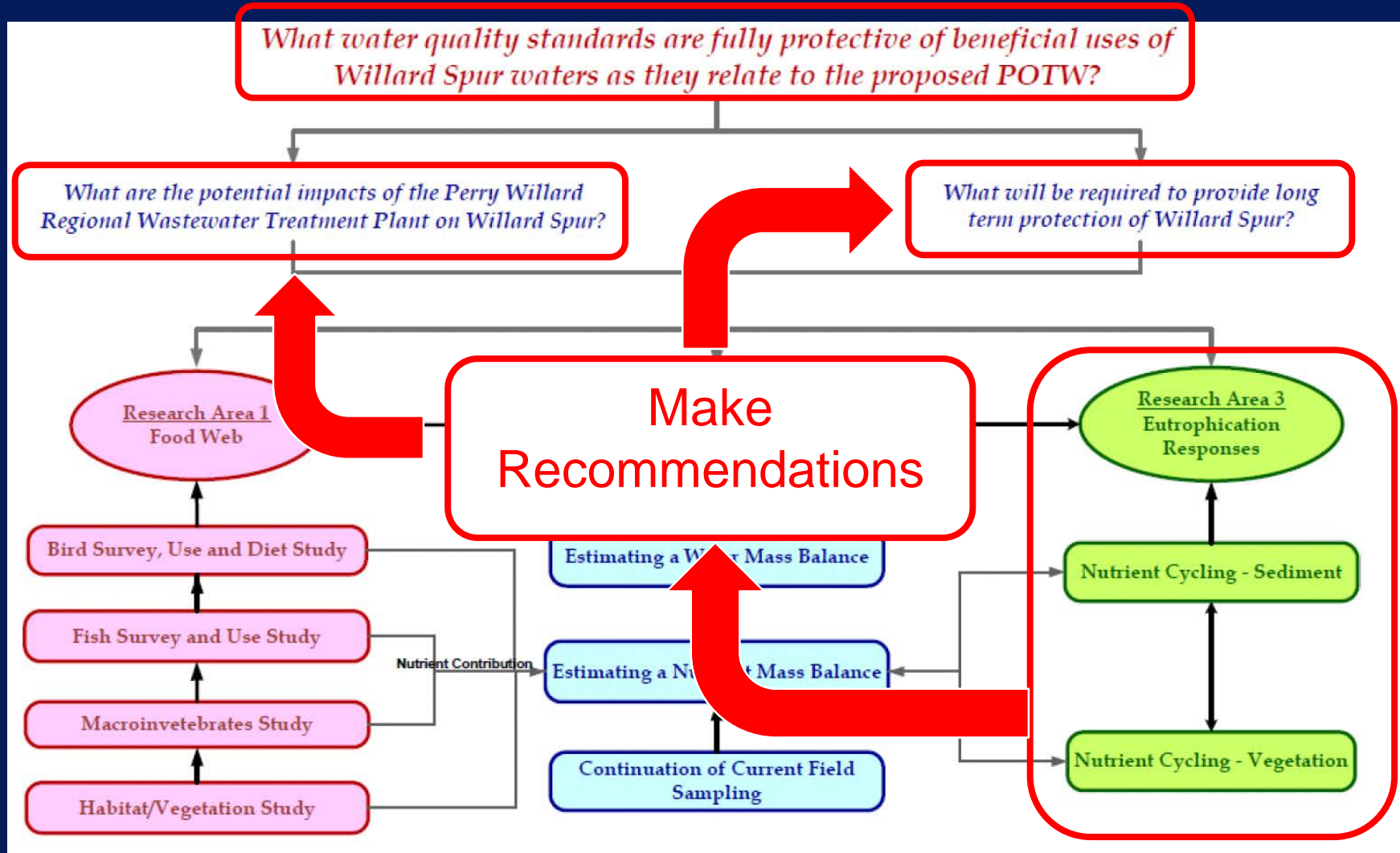
- **Discuss potential impacts from the Plant**
- **Identify potential recommendations for protecting Willard Spur**



**Agree on our path forward**



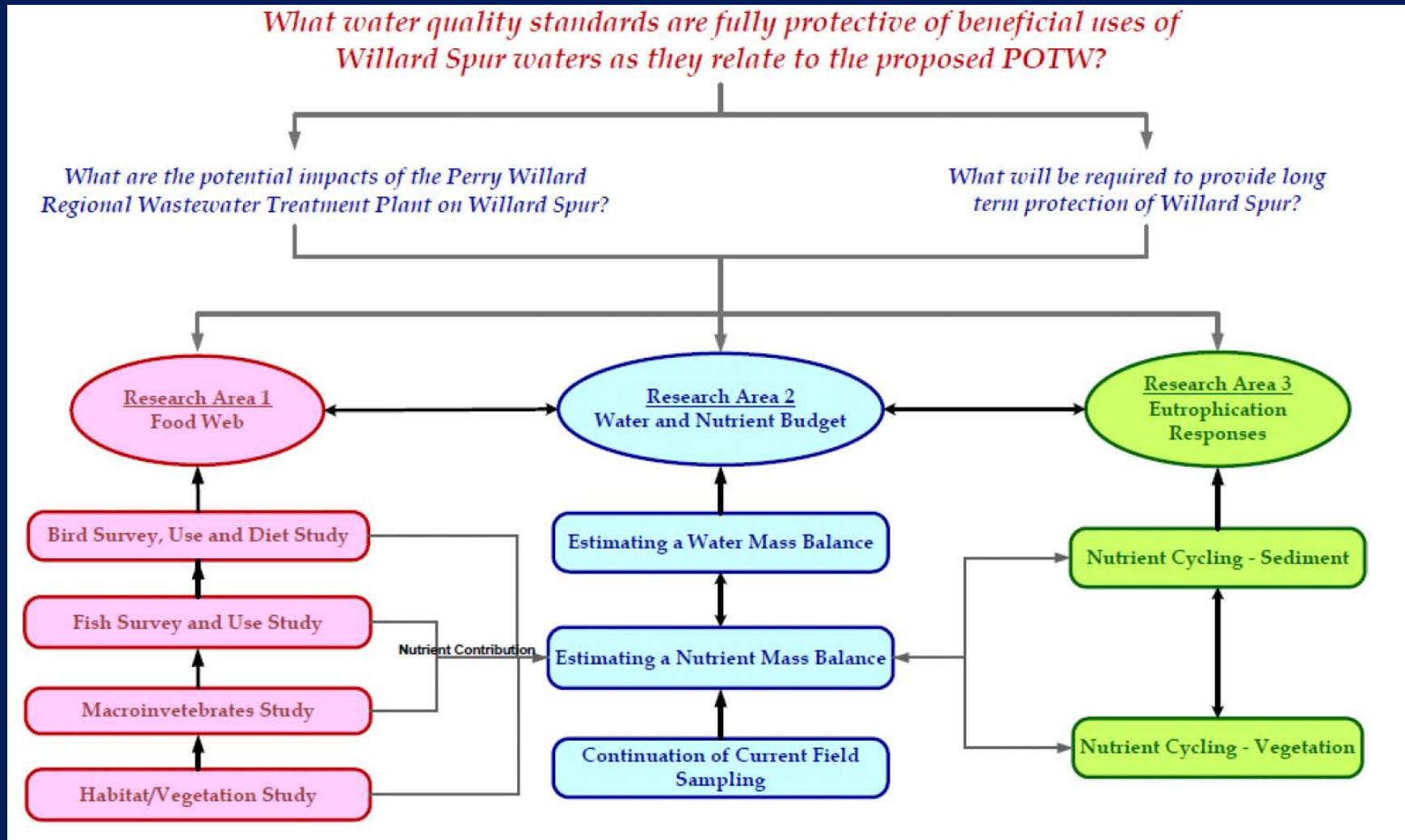
# Willard Spur Research Plan



Looking at historic and current changes due to nutrients

Looking at potential future changes due to nutrients

# Willard Spur Research Plan



Looking at historic and current changes due to nutrients

Looking at potential future changes due to nutrients



# What are the potential impacts of the Plant on Willard Spur?

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1. What characteristics of the effluent are of concern?
2. What are the nutrient loads in the effluent with & without nutrient removal?
3. What are the sources of nutrients and their relative significance?
4. How much of the Plant's load reaches Willard Spur?
5. How will the outlet channel respond?
6. When does the effluent reach Willard Spur?
7. How might nutrients affect the ecosystem?





# What will be required to provide long term protection of Willard Spur?

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1. What are the beneficial uses of Willard Spur?
2. What is the present condition of Willard Spur?
3. What are “natural” responses vs responses to the Plant?
4. How is Willard Spur cycling/responding to nutrients?
5. What factors influence how Willard Spur responds to nutrients?
6. How might Willard Spur respond to increased nutrients?

Key questions for all GSL wetlands

UofU Test Plots

UofU Microcosms

DWQ Mesocosms

What are the significant nutrient cycling processes?

How do they influence our recommendations?

