



# McNary Reservoir Flowering Rush work 2019

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Unclassified/FOUO



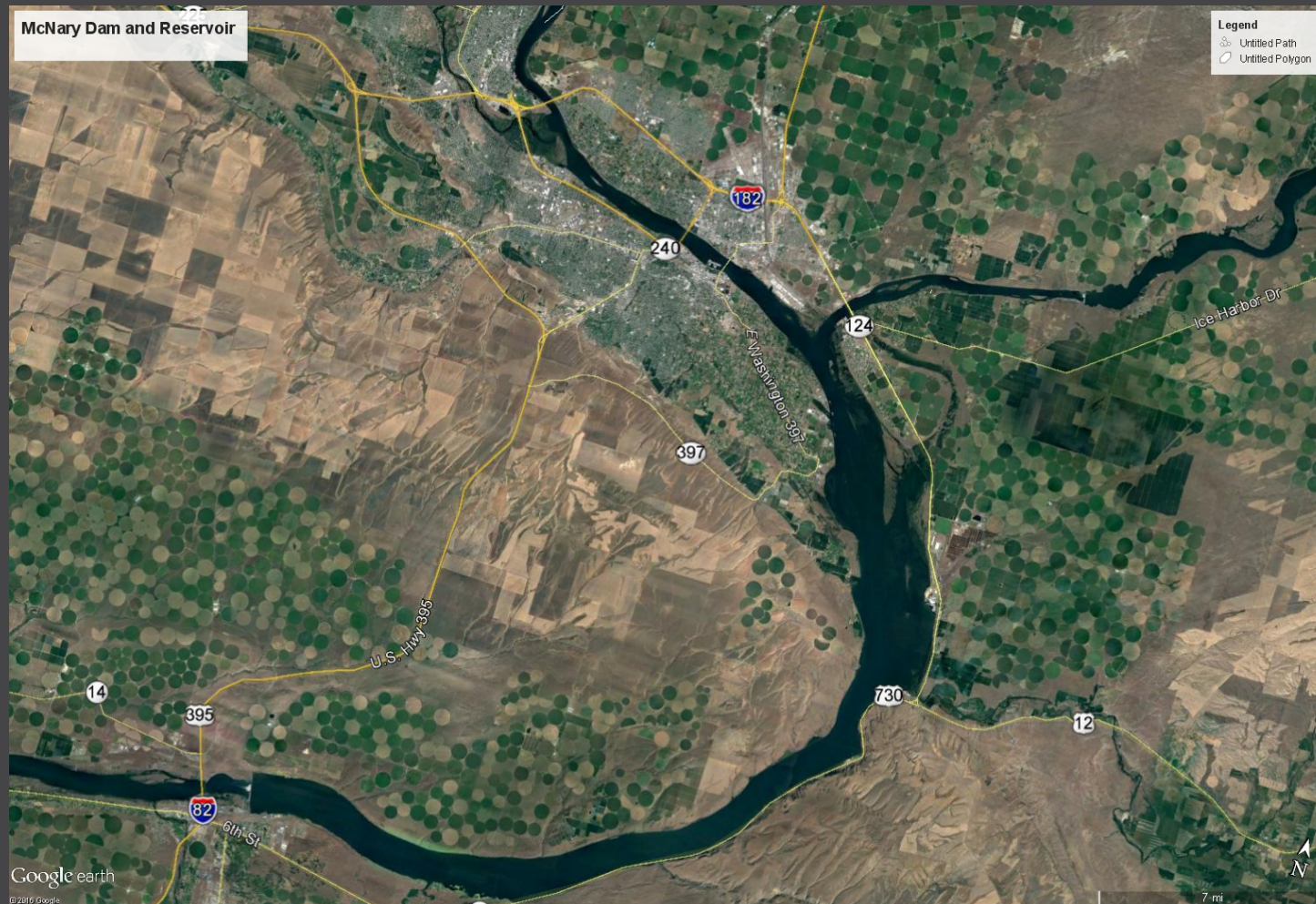
US Army Corps  
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DISCOVER | DEVELOP | DELIVER



Over 64 river miles in McNary Reservoir and over 242 miles of shoreline.



# Number of Projects:

- 1) Flowering rush sediment growth study.
- 2) Flowering rush induction in response to various herbivory: simulated, actual, and chemical treatments
- 3) Field trails of various curtains (bubble and solid) and chemical treatment of Flowering Rush.
- 4) FR biology studies.
  - A) Flowering rush ploidy plant competition study in submerged and emergent trials.



## Osprey Point/Port of Pasco FR Site:



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# Flowering Rush Sediment Study

Testing sediment from locations in McNary Reservoir where no flowering rush has established.

These areas are suitable habitat, depth, sediment type, and have flowering rush found above and below these locations in McNary reservoir

Testing to see if FR will grow in the sediment and compare growth biomass between sites known to have FR and those not.

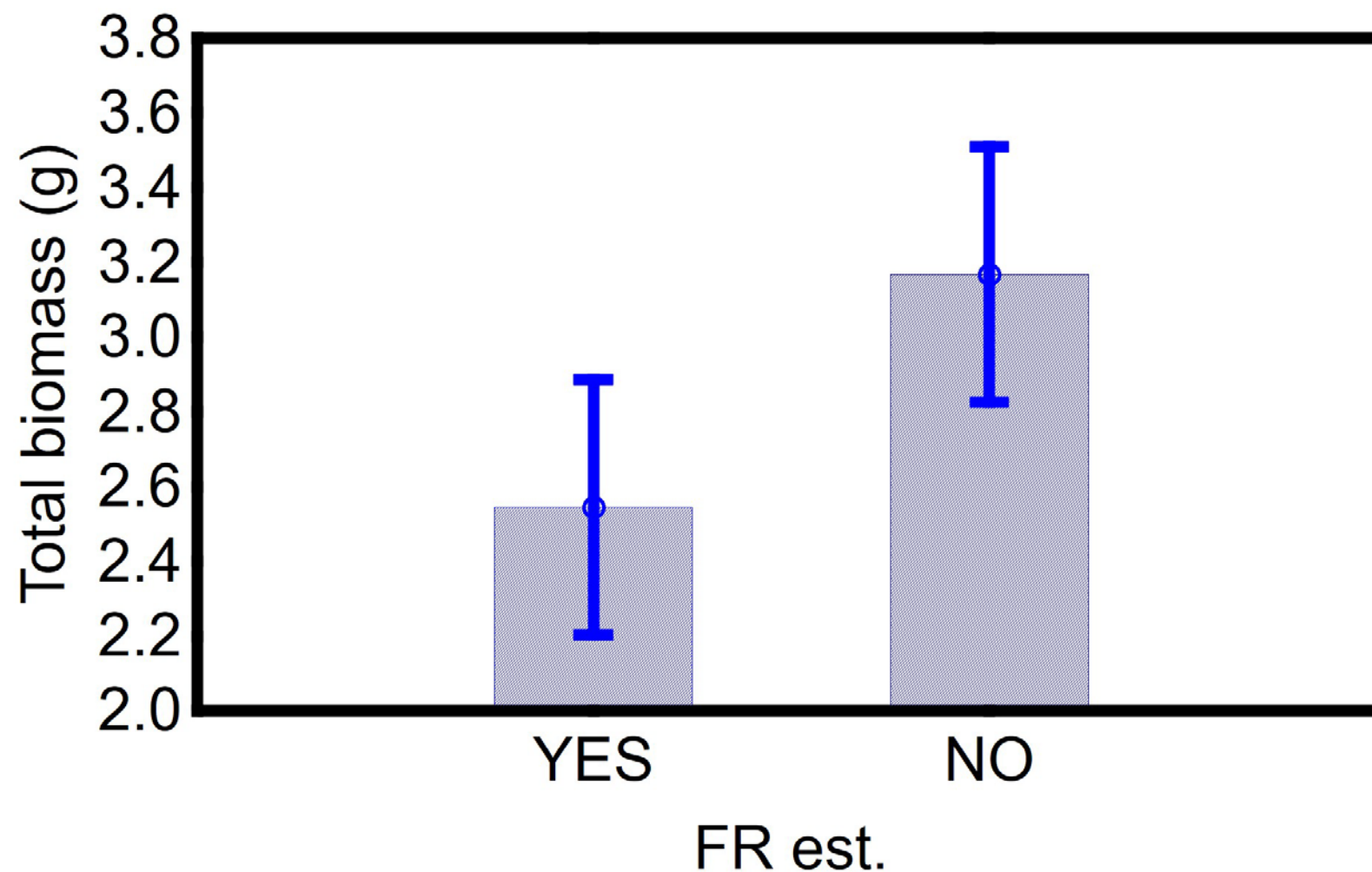
If FR doesn't grow or significant difference between non-FR site and FR sites then will perform chemical analysis on sediments.

Collected sediment samples from McNary Reservoir of 3 known FR sites and 3 non-FR sites in last week of March in 2019.

## Results:

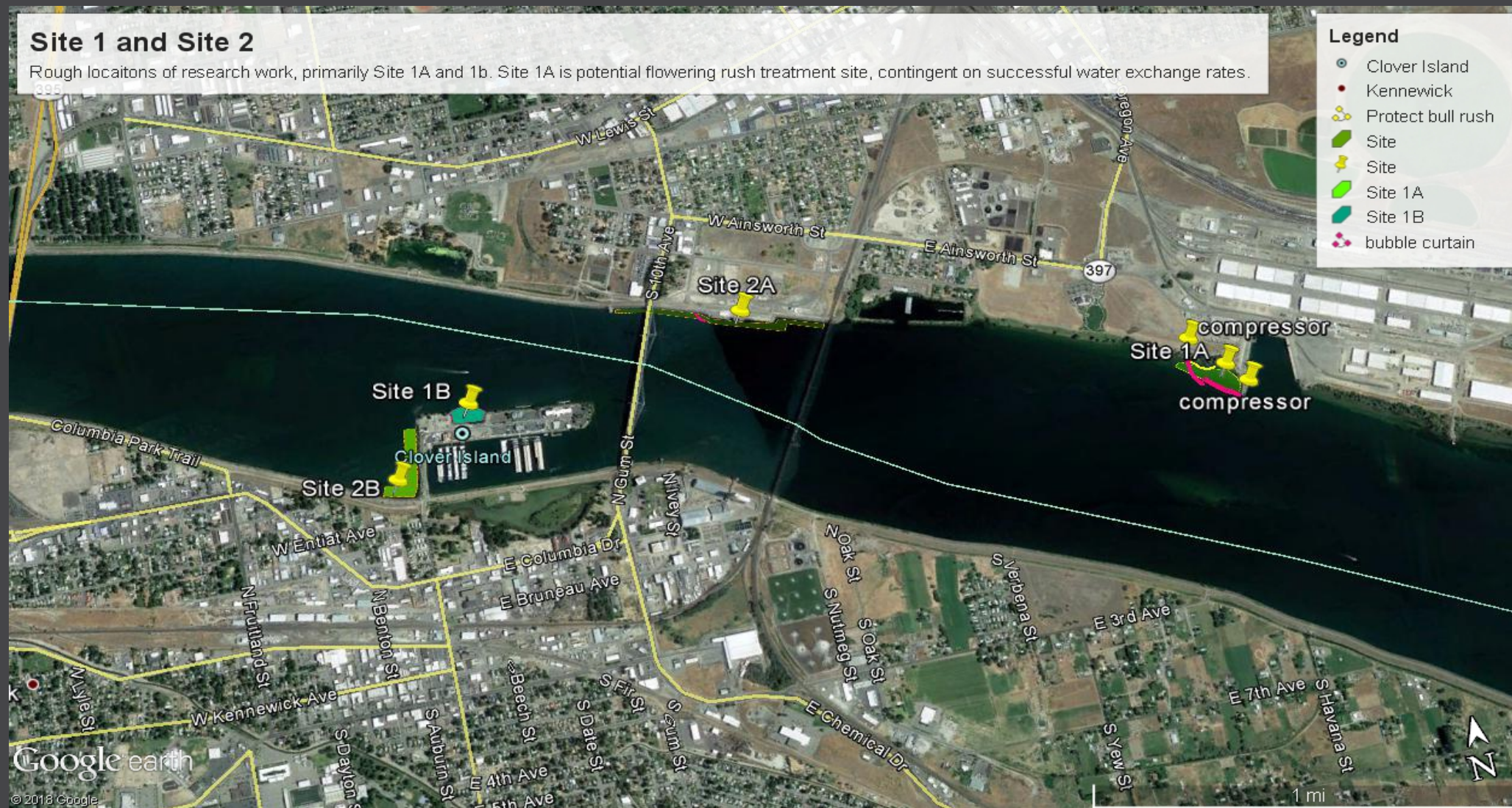
Current effect:  $F(1, 18)=1.6636$ ,  $p=.21344$

Vertical bars denote  $\pm$  standard errors





# 2019 Field sites for Curtain Testing and Diquat Treatment:





## Solid Curtain:



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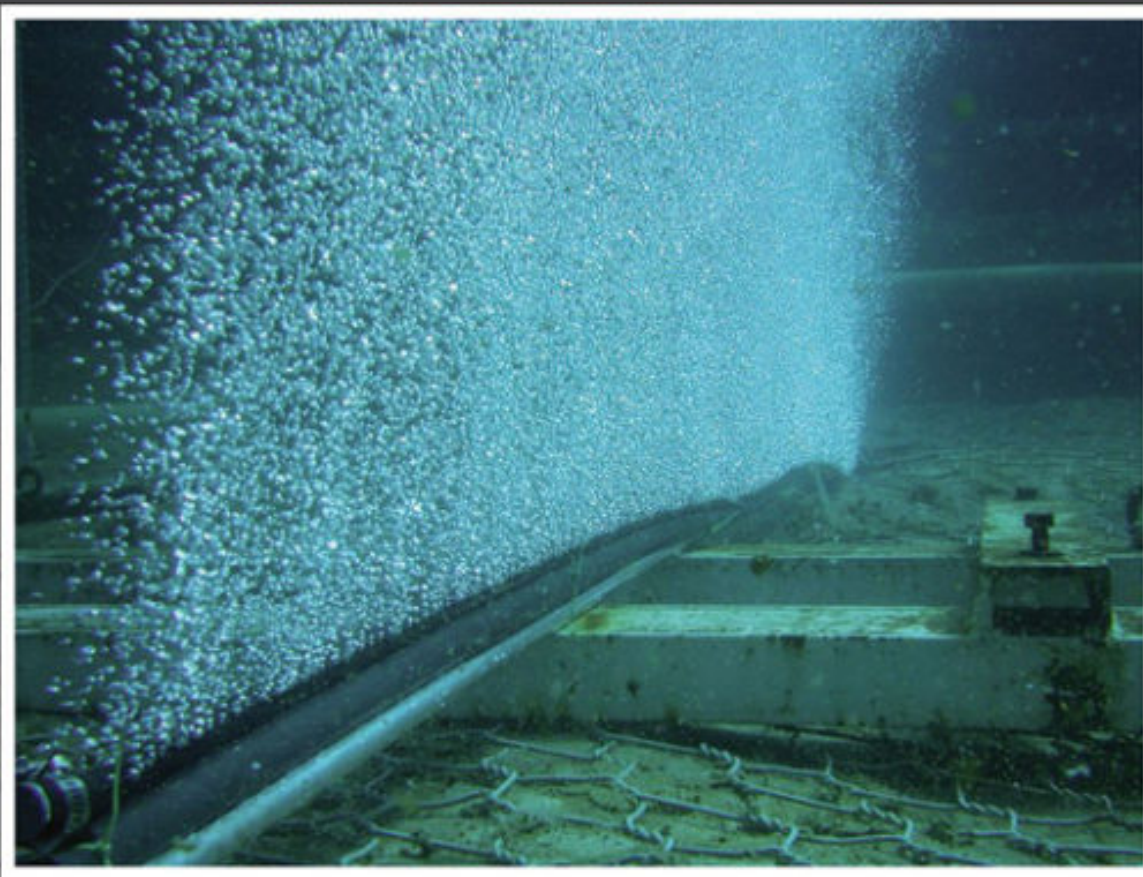
# Multiple Bubble Curtain Scenarios:

## 2019 Field Trial

Bubble curtain placement for tests and treatment.



# The Bubble Curtain:





## Bubble Curtain Cont:



## Without Bubble Curtain:



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## With Bubble Curtain:



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## **Additional FR work ERDC is performing:**

- 1) Collected FR specimens from McNary Reservoir for Concentration Exposure Time (CET).**
- 2) Perform Concentration Exposure Time (CET) in growth chamber.**
  - 2019 used roughly six week growth specimens**
  - 2020 using roughly six month growth specimens**



## Concentration Exposure Time (CET):







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## CETs Cont:

- 1) Testing three products that literature shows levels of effectiveness on FR.
  - a) Diquat Dibromide (Reward), Endothal (Aquathol), and Diquat Dibromide/Endothal combination (AquaStrike)
- 2) All products applied at maximum concentration allowed by product label.  
Reward (0.37ppm), Aquathol (5ppm), AquaStrike (1.8ppm(Endothal) & 0.36ppm(Diquat))
- 3) Testing three exposure times (3hr, 6hr, 12hr) of the above products to determine effectiveness on McNary Reservoir Flowering Rush. Above and below ground biomass was collected 4, 8, and 12 weeks after treatment to determine herbicide efficacy.
- 4) Exposure times are based on potential projected exposure times in a run of a river reservoir system.

## Upcoming Proposals for Research



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## Currently Two Proposals in for Funding-

- 1) Ecology and Biology of Flowering Rush.
- 2) Diploid control methods.

# Acknowledgments and Thanks.

## ERDC:

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- Dr. Linda Nelson

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# Questions:

