

# Delta Restoration Hub Overview

Campbell Ingram

with

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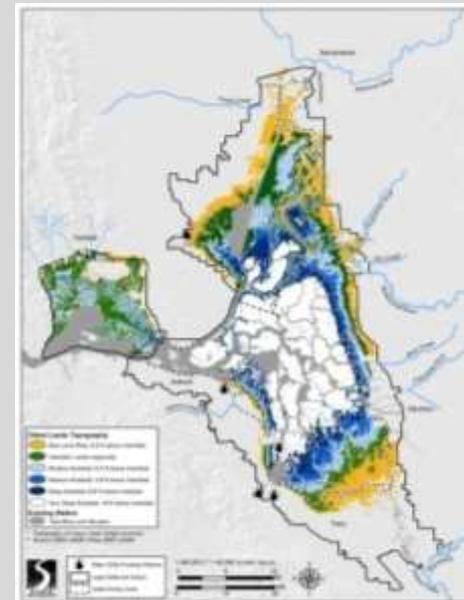
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# Objectives of a 3-year Pilot Hub

- Bring together technology, people and process to ensure best available science, local input and adaptive management—cornerstones of an effective Delta restoration program.
- Address fundamental problems that currently delay projects moving from concept to construction.
- Help coordinate and integrate Delta restoration initiatives.

# Who Developed the Hub

- Delta Restoration Network – 11 agencies (DWR, SFCWA, DFW, NMFS, USFWS, COE, SMRCDD, DSC, DSP, DPC, DC), NGO's (TNC, Audubon, American Rivers, SFEI), Consultants (ESA, Wetlands and Water Resources, MWH, NewFields), and Delta community (5 County Coalition)
- Small subset group developing the Hub proposal (DC, DSC, DSP, SFEI, ESA, NewFields)

# Problem/Opportunity Statement

Delta restoration planning currently lacks:

- A broadly accepted landscape-scale restoration vision for the six recognized restoration opportunity areas supported by conceptual and mechanistic models
- Sufficient early engagement of the Delta community
- Modeling, data inventory, and synthesis tools to support analyses, information sharing, and adaptive management
- A standing expert restoration design team to
  - Support timely property-scale restoration project planning
  - Develop long-term restoration visions for restoration opportunity areas
  - Consider the Delta-wide effects and cumulative impacts of restoration projects

# What is the Restoration Hub

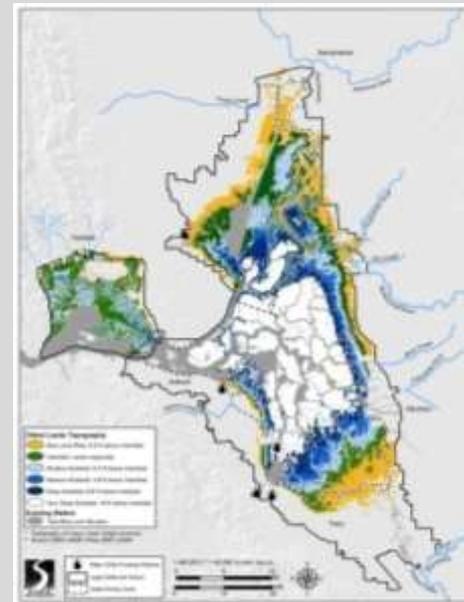
- Tools, Standing Panel, and Process (think smartphone and DRERIP)
- Ensures best available science, local input and AM in landscape visions and individual projects
- Intended to speed up the process and result in cost savings
- Not mandatory! (FRPA, FAST, BDCP)
- Free tools!!!

# Punch line at the top

Stand up a expert hub team supported by models and data analysis for

- Regional landscape visions
- Restoration design alternatives
- Grasp the ecosystem cascade

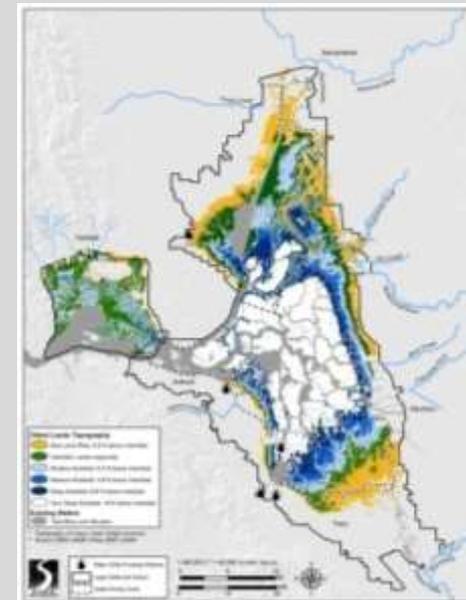
*Credible, skillful, fast, voluntary*



# What the Hub **does**

## *Restoration is many steps:*

- Acquisition
- Site evaluation
- Neighbor issues
- Permits
- Credit application
- CEQA
- Construction
- Levees/flood protection
- Land ownership and O&M
- Performance measurement
- Adaptive management over time



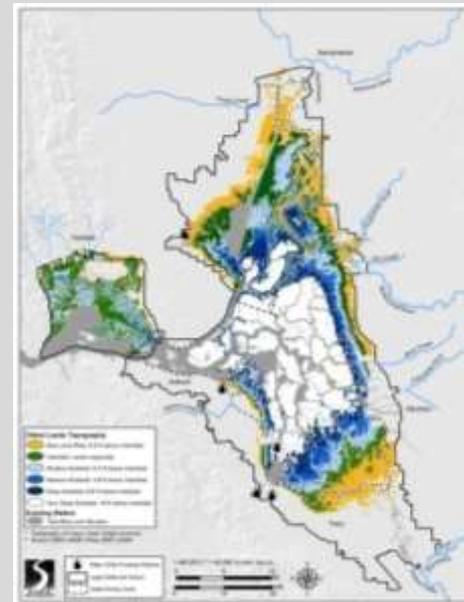
# What the Hub ~~does~~

or not

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Not Hub activities



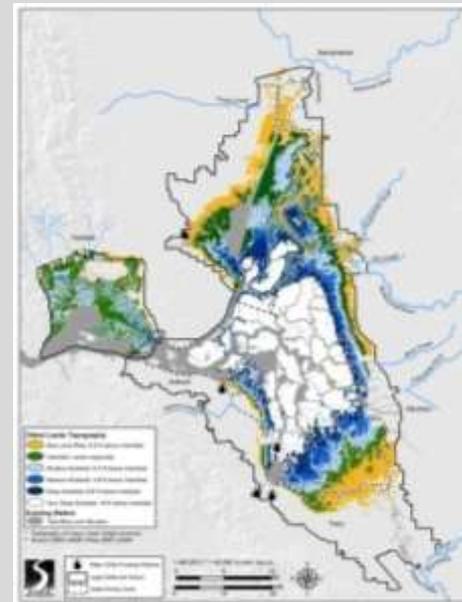
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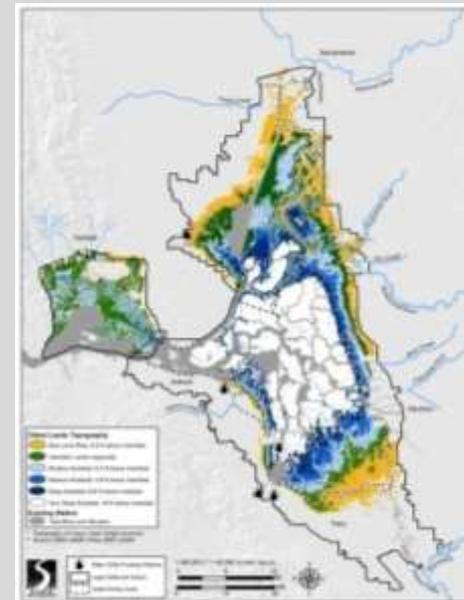
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- Many permits
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But it might help...



# What the Hub **does**

- Regional landscape scale visions
- Restoration design alts (DRERIP)
- Cumulative impacts—ecosystem cascade
- Recommend science going forward



# What the Hub **is**

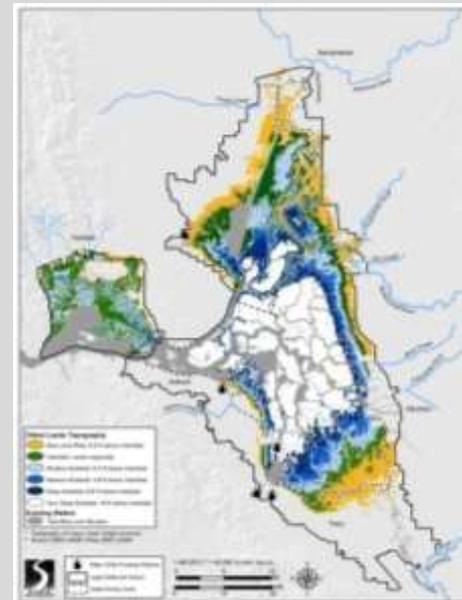
- Recognized multi-disciplinary experts with key agency and stakeholder folks
- A data and modeling analysis center
- A center for decision support
- A place where “what if” and “so what” are THE questions



# What the Hub *is*

The Hub *is* best available science because

- Experts are in the room
- Models are running in the room
- Data is at hand now



# Why a restoration Hub?

At the scales envisioned:

*(Bumper stickers  
will be issued)*

**Changes change the changes**

**Effects affect the effects**

# Why a restoration Hub?

At the scales envisioned:

*Restoration effects are*

- *Non-linear*
- *Thresholds*
- *Feedbacks*
- *Eco-cascades*

➤ *In a word: Complex*

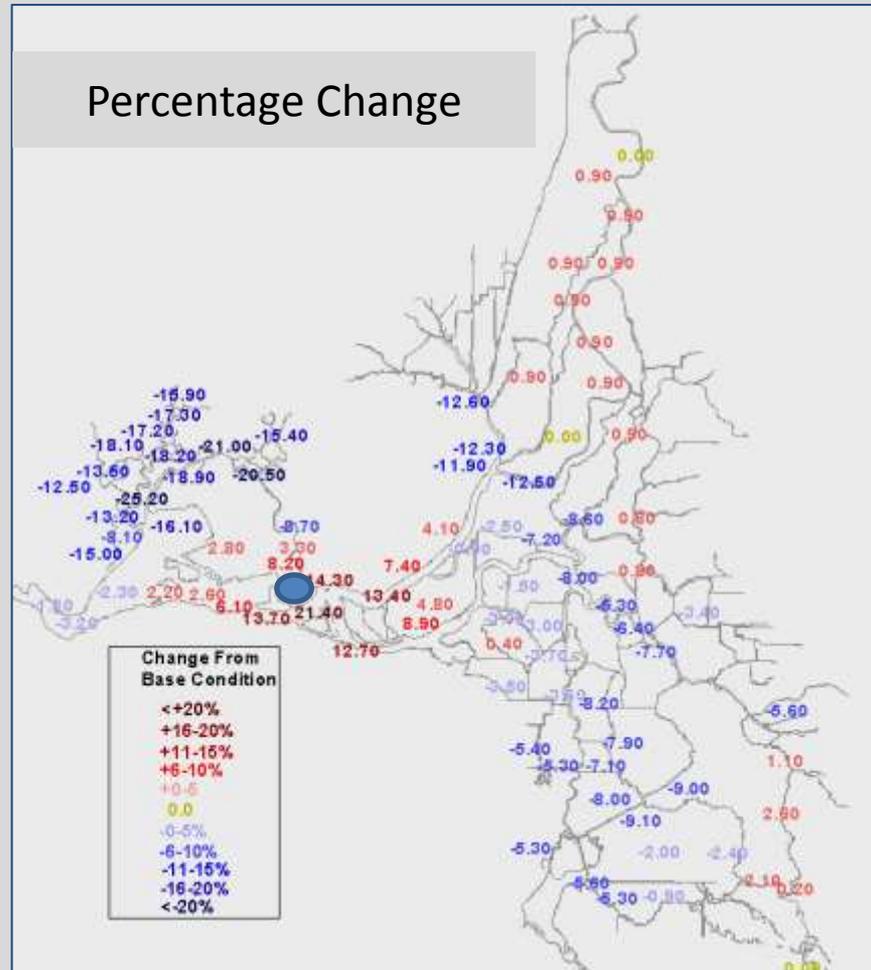
➤ *Yet tractable if we set ourselves up well*

*Changes change the changes*

*Effects affect the effects*

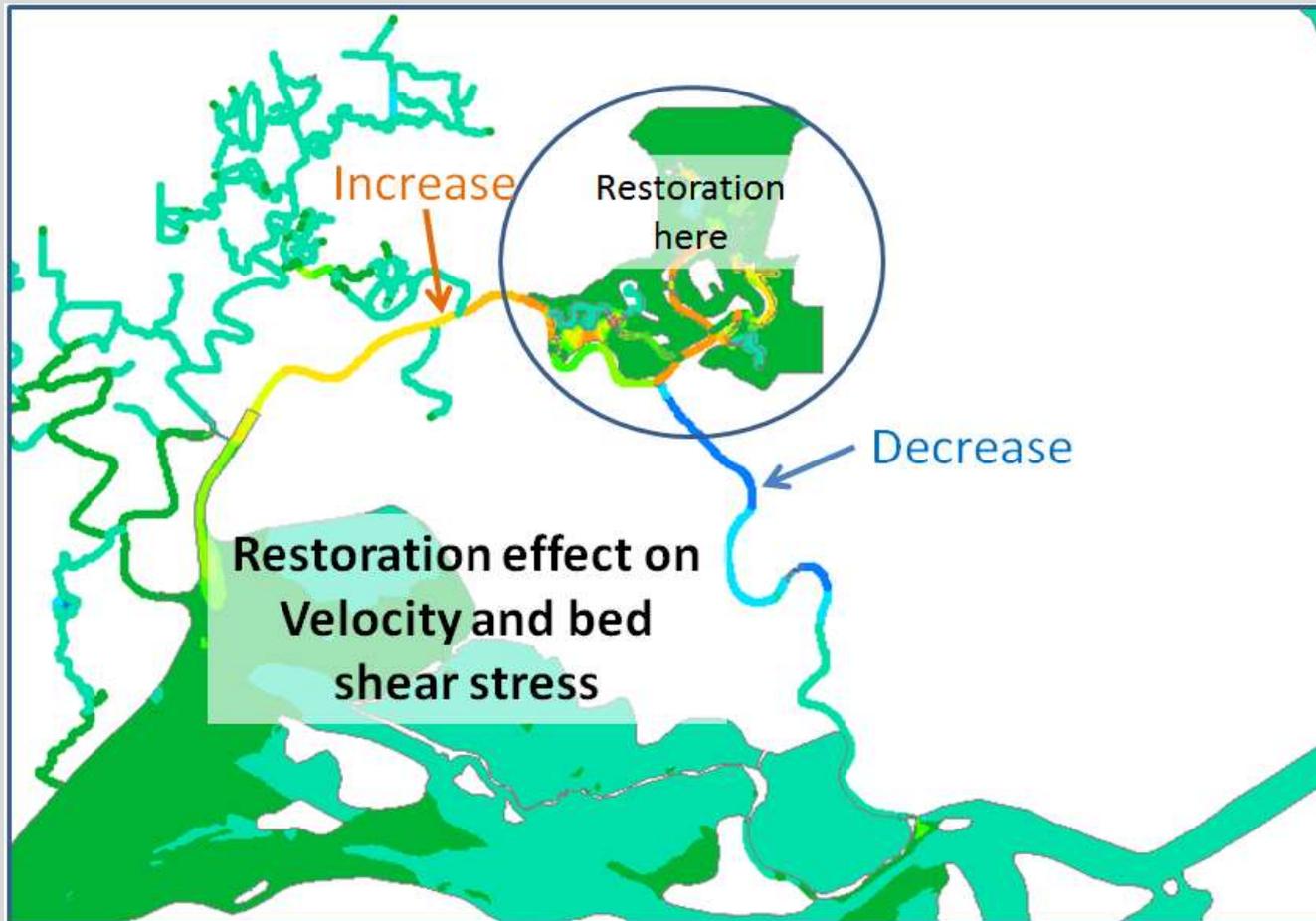
# Why a restoration Hub?

**Restoration will:** Decrease *and* increase salinity



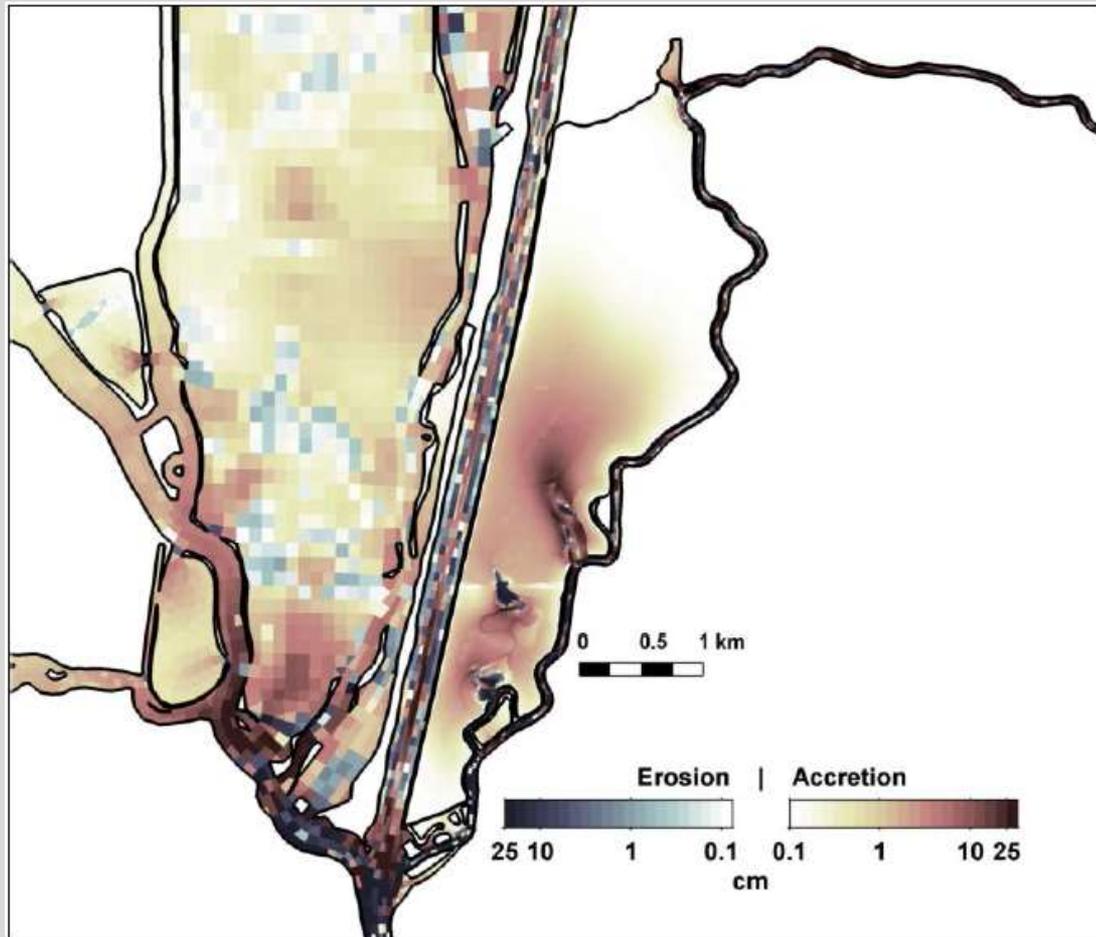
# Why a restoration Hub?

**Restoration will:** Increase *and* decrease velocity



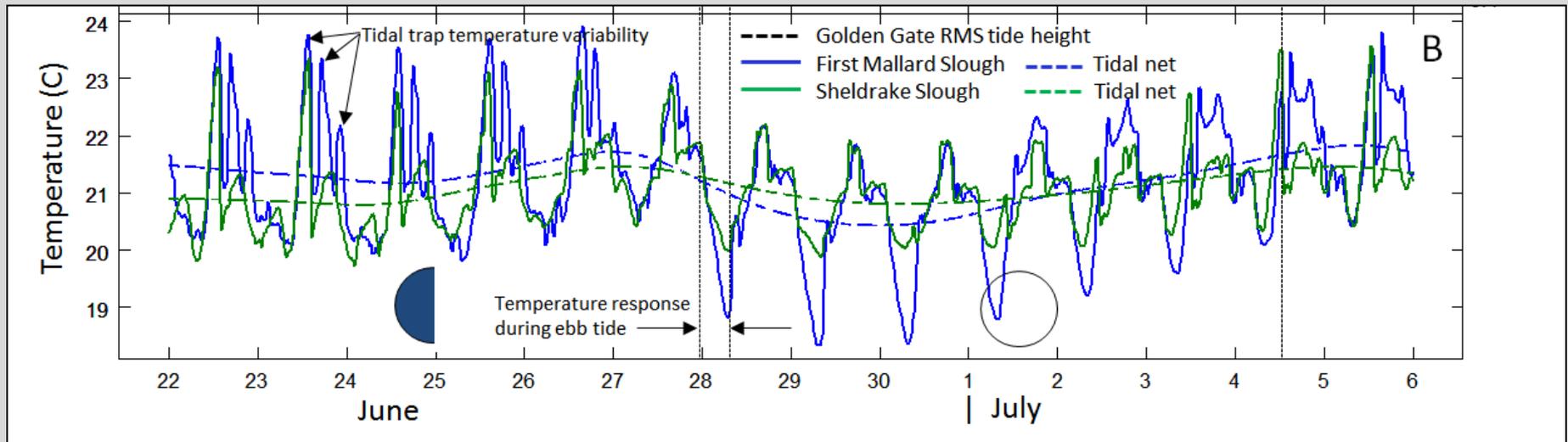
# Why a restoration Hub?

**Restoration will:** Cause sedimentation *and* erosion



# Why a restoration Hub?

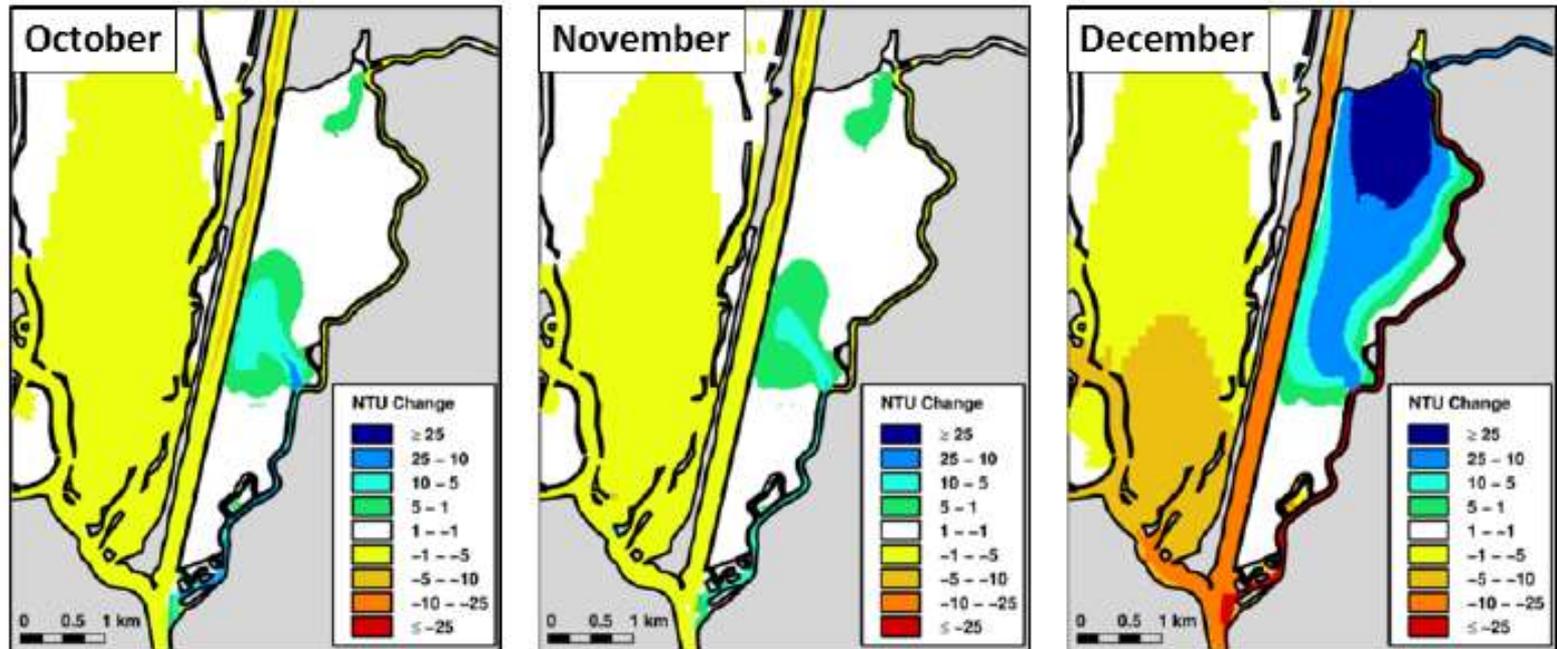
**Restoration will:** Make water warm *and* cold



# Why a restoration Hub?

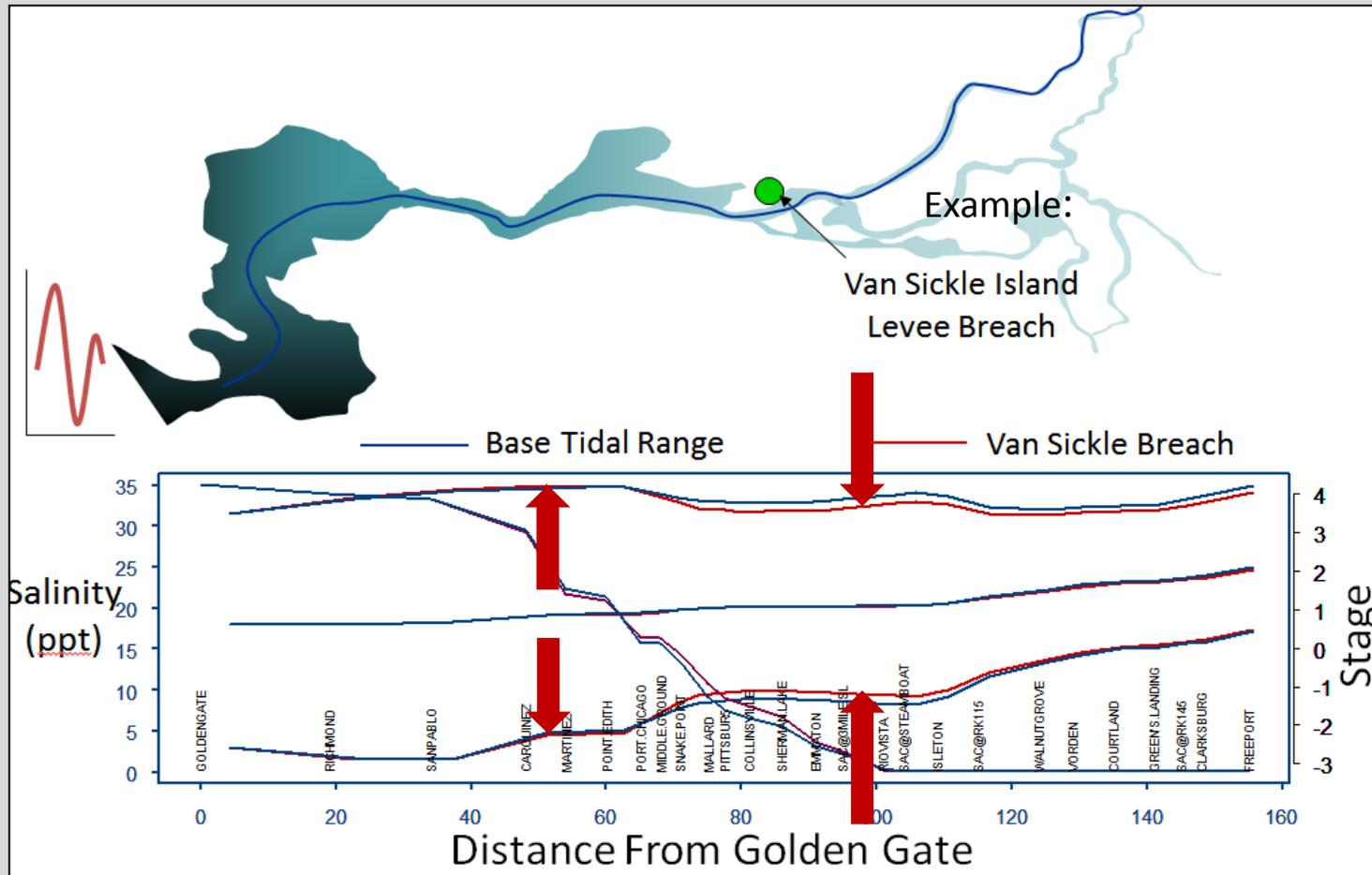
**Restoration will:** Increase *and* decrease turbidity

## A. Turbidity Change in NTU



# Why a restoration Hub?

**Restoration will:** Make tides bigger *and* smaller



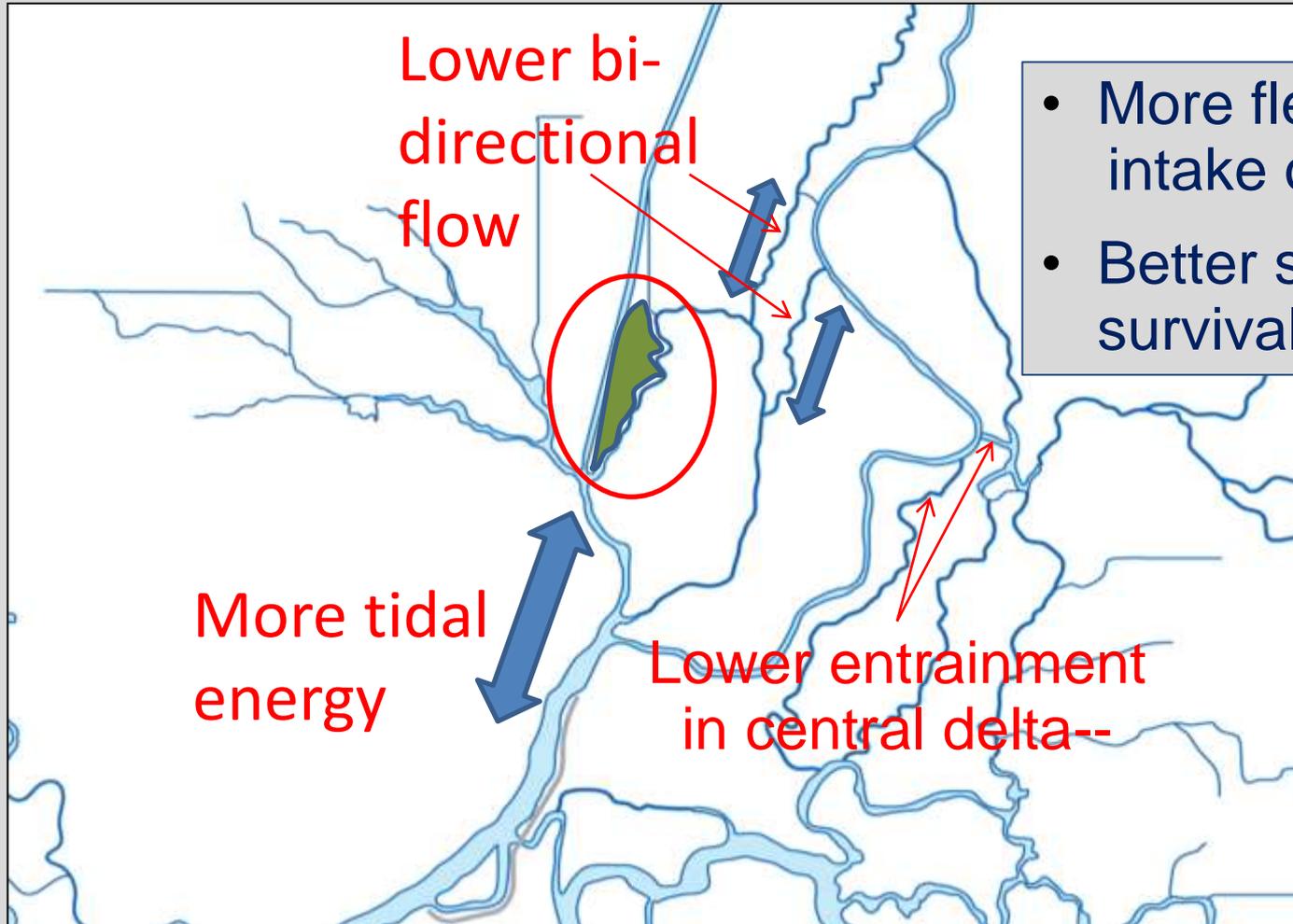
# Why a restoration Hub?

***Restoration will:*** Methylate *and* sequester Hg



# Why a restoration Hub?

**Restoration will:** require systems consideration



- More flexible intake operations?
- Better salmon survival?

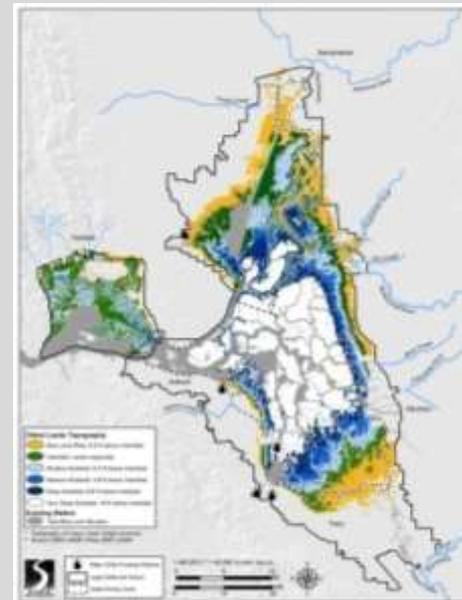
# Why a restoration Hub?

- Best  
Available =  
Science
- The right people
  - Great tools
  - Routine collaborative environment

# How the Hub functions

*Projects comes to the Hub with:*

- Specific objectives
- Site evaluation complete
- Constraints and opportunities



# How the Hub functions

## *Routine Collaborative Environment:*

- Expert contracts and agreements in place
- State of the art data tools and analysts on site
- Modeler contracts in place

# How the Hub functions

## *Prior to first Hub meeting:*

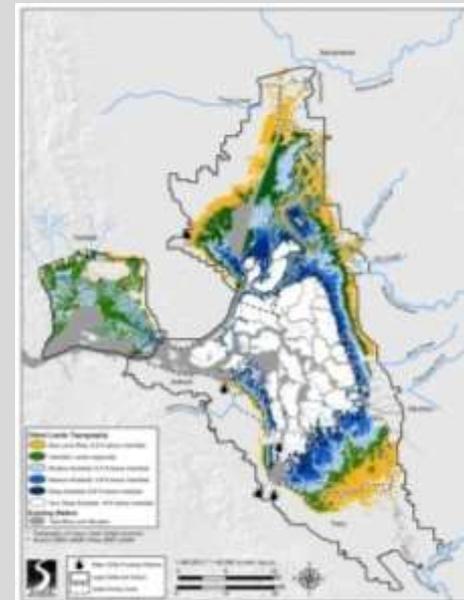
- Compile data (historical baseline, elevation, site evaluation, etc)

## *1st expert meeting (1-2 days):*

- Common understanding
- Review regional landscape vision
- Baseline data informatics presentation
- Identify non-science constraints

## *Expected outcomes:*

- Scope initial modeling and output metrics



# How the Hub functions

## *2nd Hub meeting (1-2 days):*

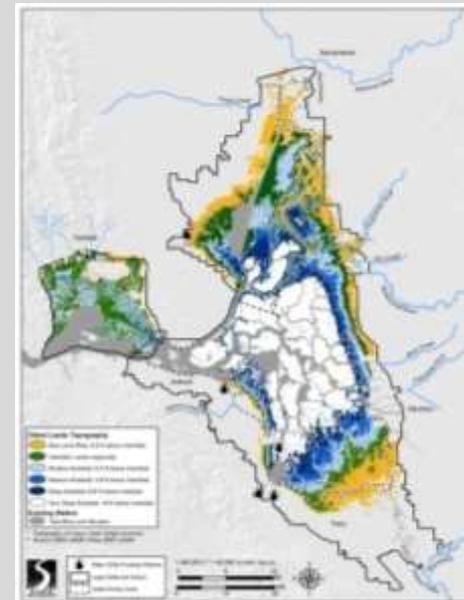
- Review modeling and data workflows
- Review expert assignments

## *Design Charrette*

- Initial DRERIP evaluation of modeling
- Develop alternatives for further modeling
- Refine data and model output metrics (workflows)

## *Expected outcomes:*

- ***Effective, acceptable, permittable alternatives***



# How the Hub functions

## *3rd Hub meeting (1-2 days):*

- Review modeling and data workflows
- Review expert assignments

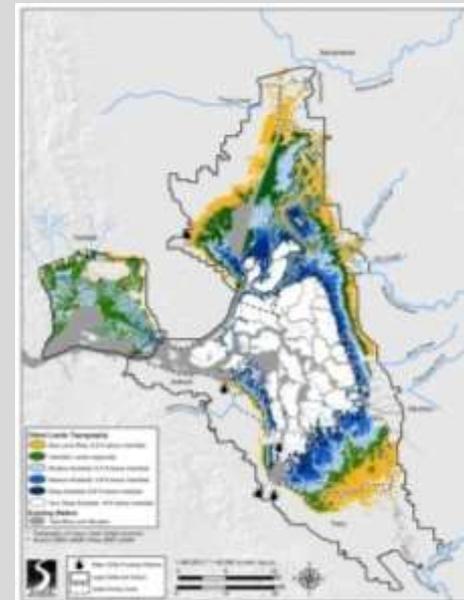
## *Design Charrette*

- Refine alternatives using DRERIP evaluation
- Refine model and data output metrics

## *Expected outcomes:*

- ***Fewer and better alternatives***

Iterate if  
needed



# Next Steps

- Develop the Hub as a three year pilot project to test process and technology
- Request software and support from “big data” provider
- Developing 15/16 BCP
- Request bridge funding from foundations
- Beginning to implement components for real time projects

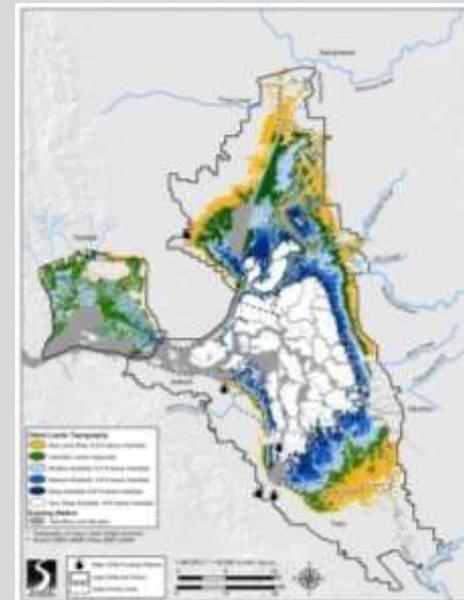


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