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From Restoration to Optimization: Adaptive Management for Carbon Sequestration and Greenhouse Gas Reduction in DWR's restored wetland ecosystems

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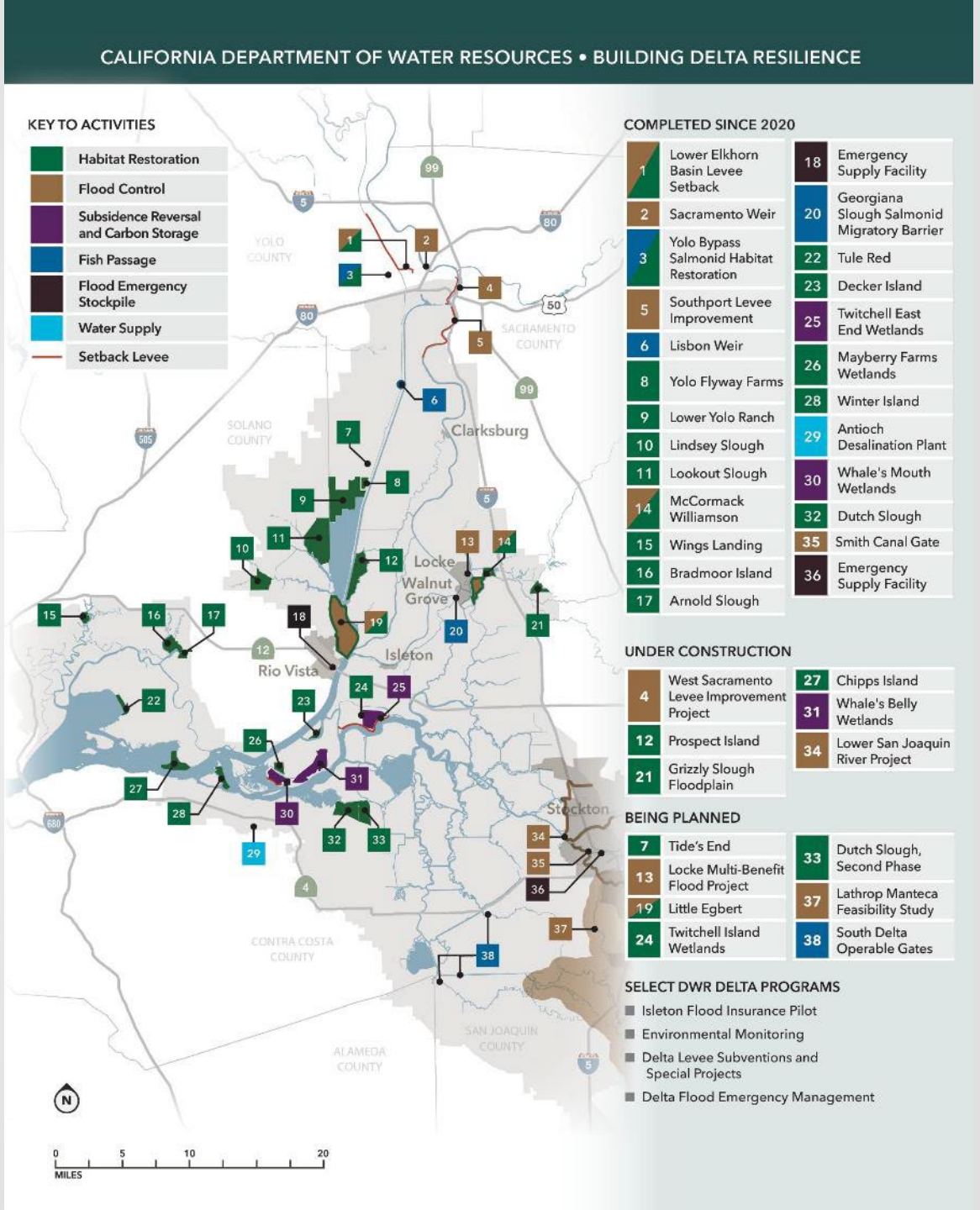
DWR's Nature-Based Climate Solutions

- DWR is leading Delta wetland restoration to:
  - Reverse subsidence
  - Sequester carbon
  - Enhance habitat
  - Protect water quality



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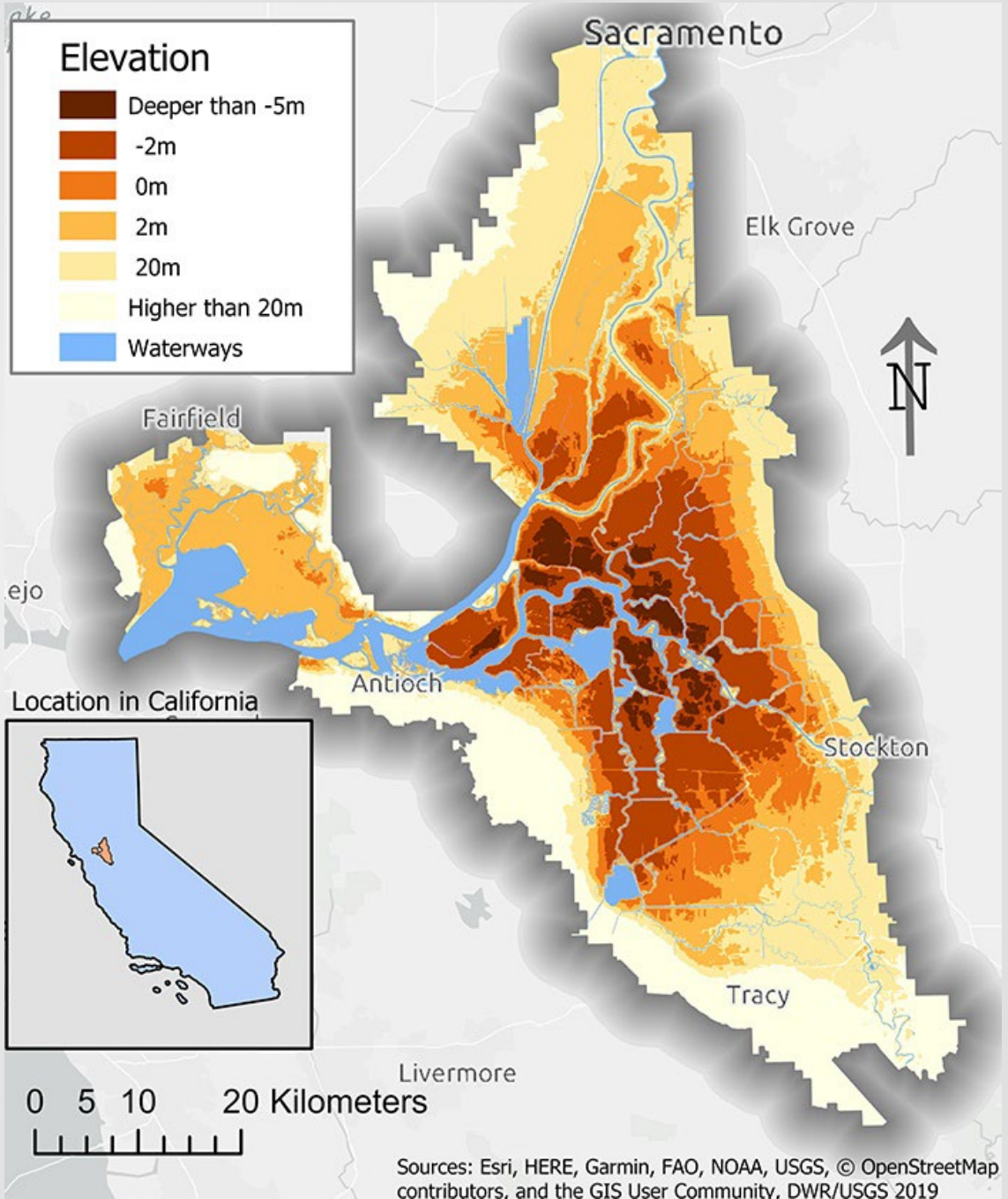
Long-term research *is why we are here!*

- DWR led research since 1997
- Identified subsidence reversal and carbon benefit
- Eddy covariance = gold standard
- Has allowed for model and carbon market development



Delta Stewardship Council
A CALIFORNIA STATE AGENCY

USGS science for a changing world

California Climate Investments

Ducks Unlimited

University of California

California Department of Water Resources

Leveraging this a top tier nature-based climate solution

- Wetlands = climate powerhouses
  - Among most effective ecosystems for carbon sequestration & climate resilience
- Scalable, science-backed solutions
  - Integrating monitoring, modeling, & management to maximize climate benefits.

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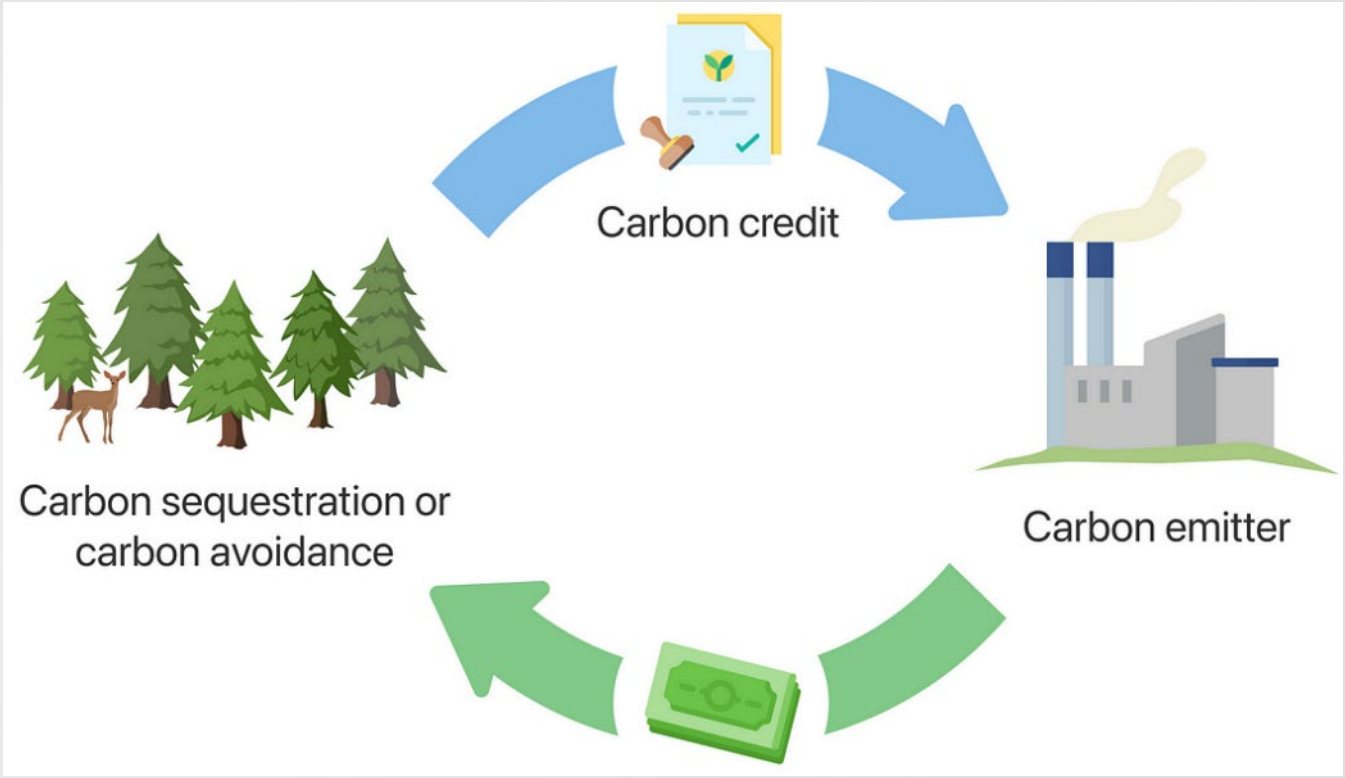
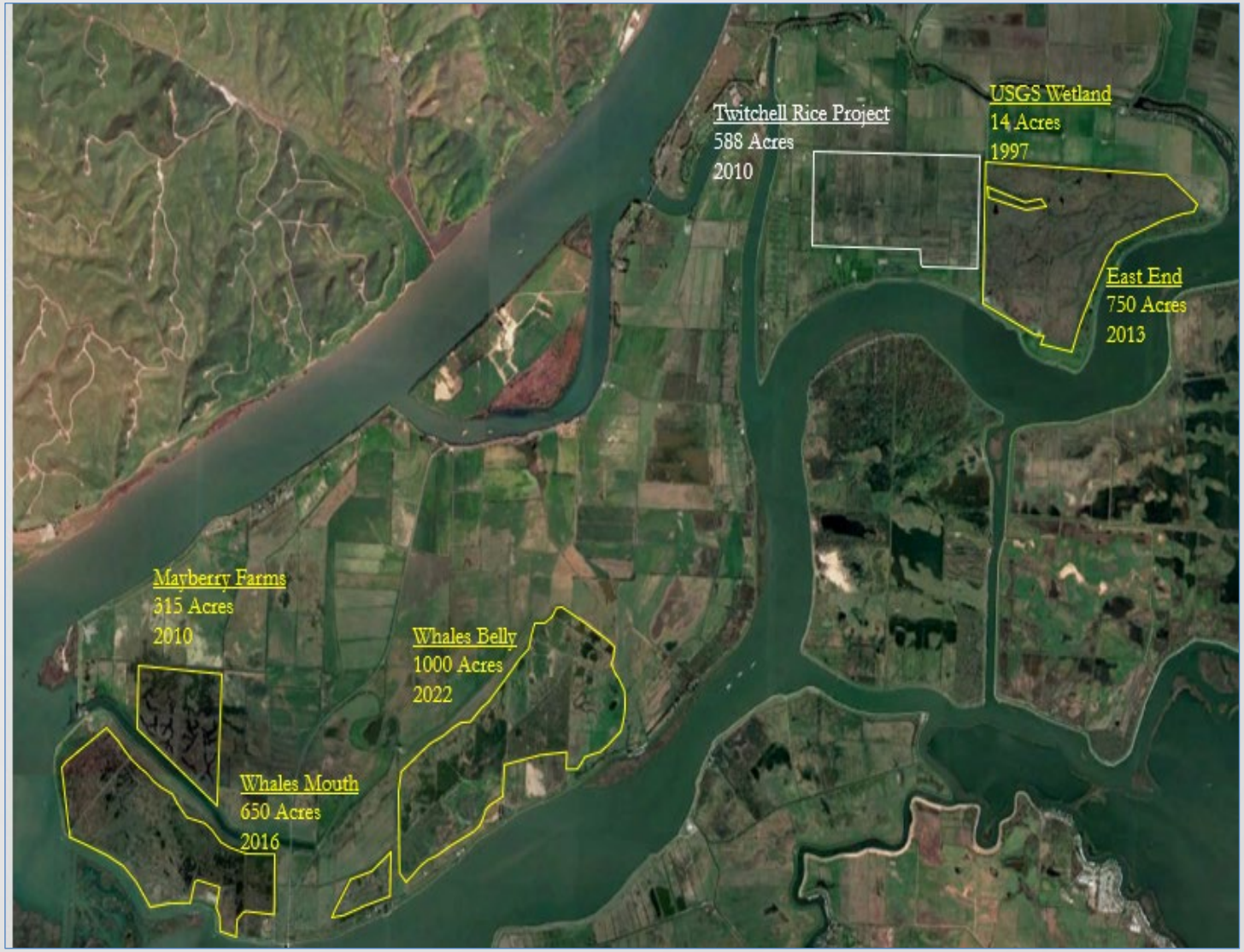
What is a carbon credit?

- **American Carbon Registry (ACR) Emissions Reduction Credits**
- Credits = ***verified reductions*** in greenhouse gas emissions
- Sold to organizations to offset emissions



Generating carbon credits at scale

- Sherman and Twitchell subsidence reversal wetlands
- 52,000 carbon credits (tons CO_2eq); ~60,000 on the way
- Translates to ~6 credits per acre annually



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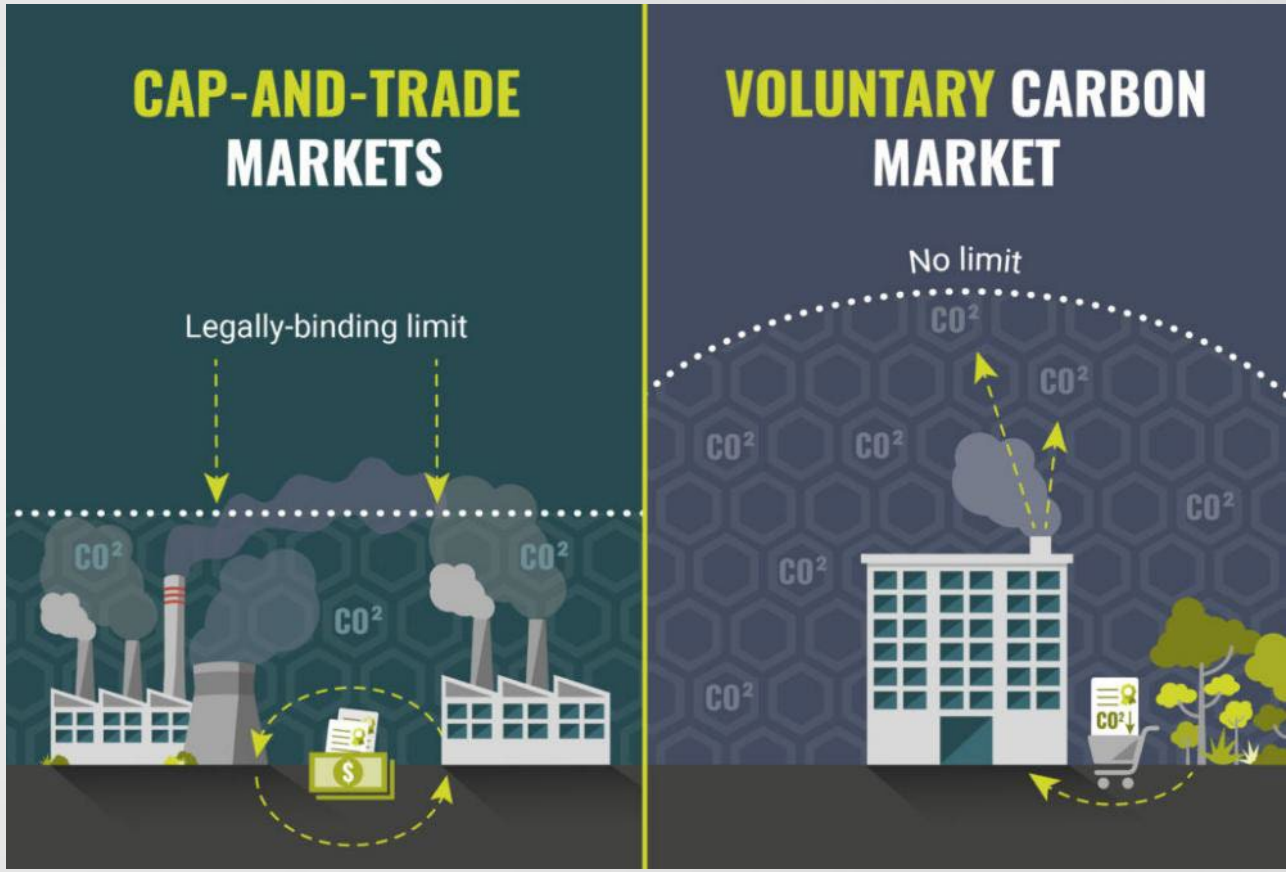
Why we need to sell credits

- Potential to fund long-term management
- Highlight value of these multi-benefit credits
- What does selling look like at DWR? Across the Bay-Delta?



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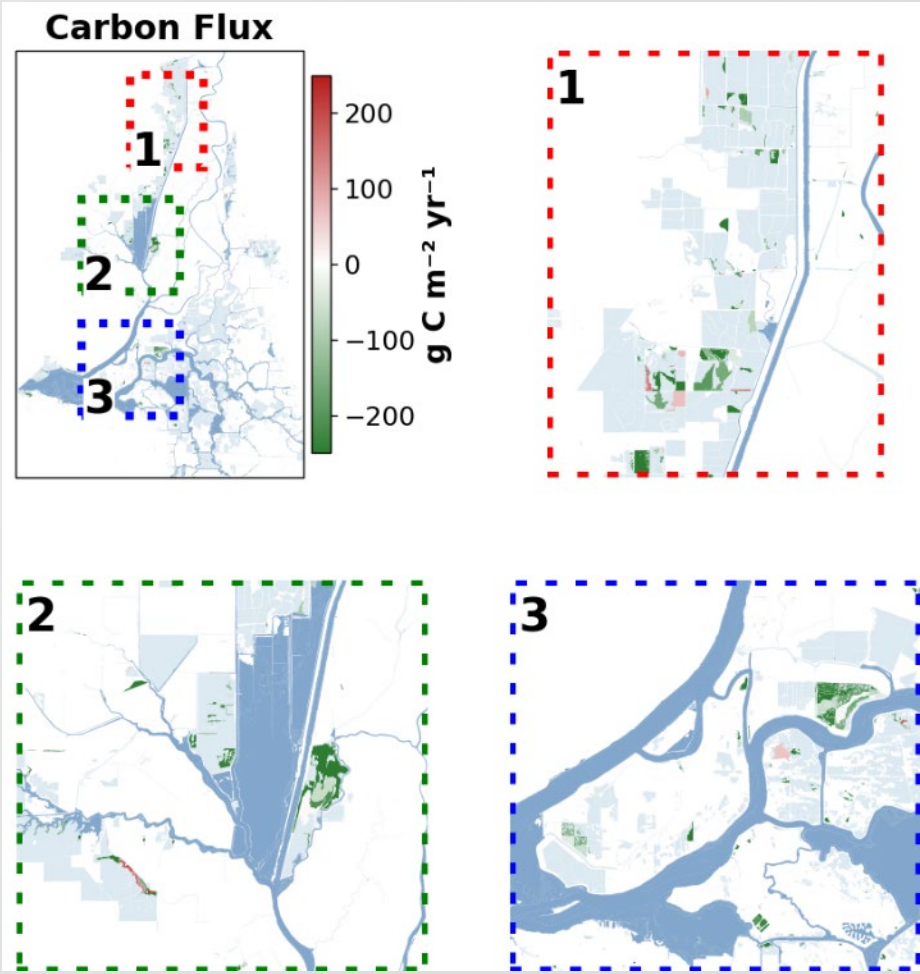
Scaling carbon credit projects: We can't measure everywhere

- Leverage monitoring, models, remote sensing to lower costs
- Tools like:
  - Mobile towers
  - **R**egional **C**limate and **C**arbon **A**nalytics **T**ool (**RCCAT**)



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The Regional Climate and Carbon Analytics Tool RCCAT

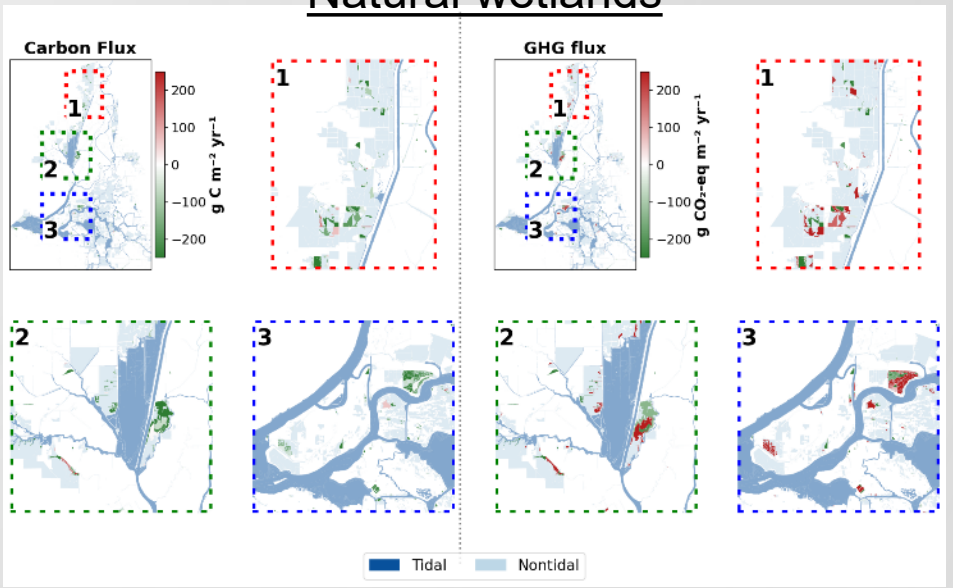
- A suite of 7 AI models ranging in complexity, using satellite (Landsat) + environmental (WLDAS) data to understand and predict patterns in CO_2 and CH_4 fluxes across vegetated landscapes.

- Trained & validated on decades of gold standard CO_2 and CH_4 flux data across multiple eddy-covariance sites

- Trained AI models are then fused with readily-available satellite and land-surface inputs to upscale CO_2 and CH_4 fluxes to the regional scale

- Enables daily, 30m tracking of carbon burial and GHG emissions.

Natural wetlands



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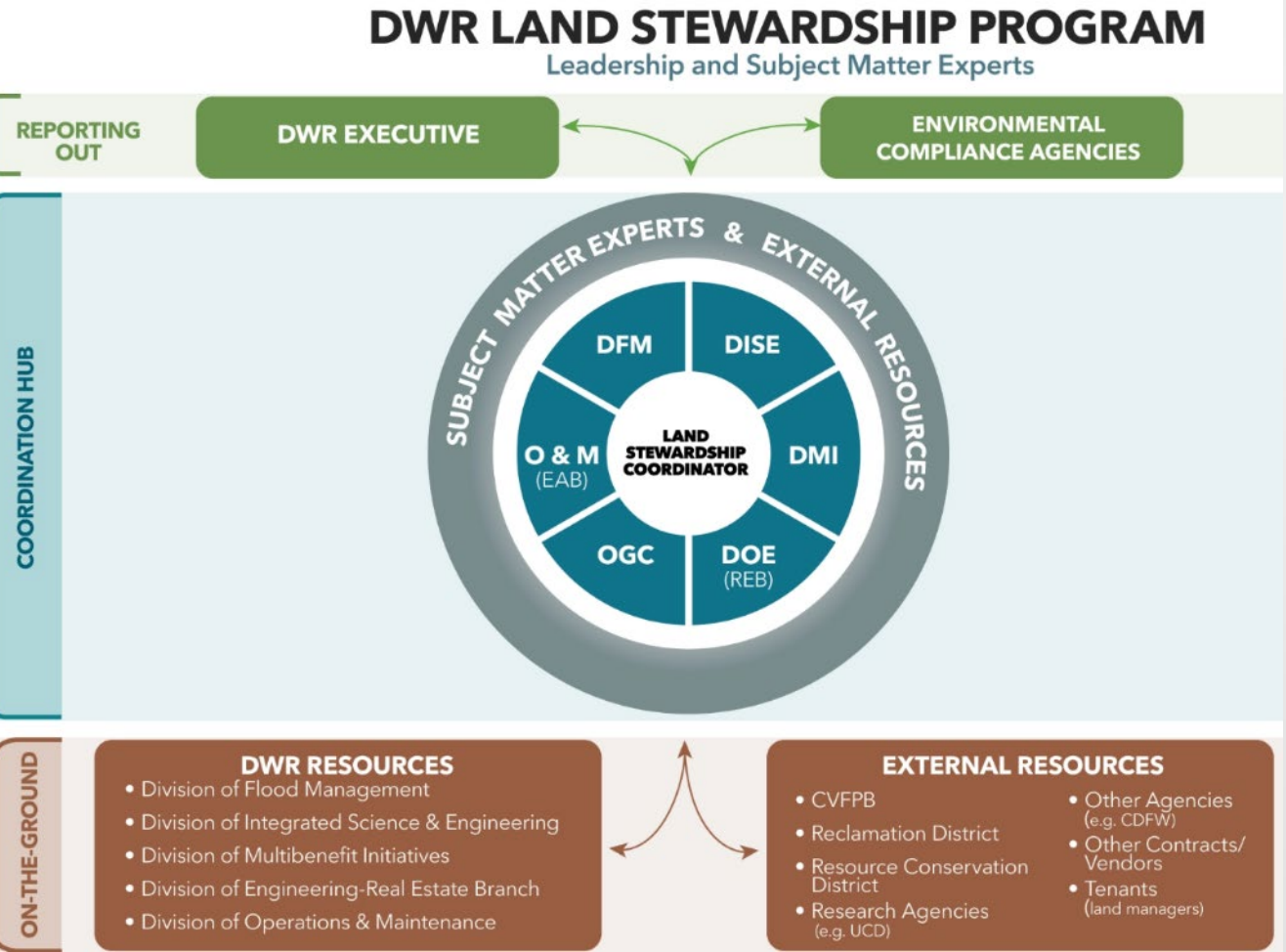

Land Stewardship Program

Multi-division effort to support maintaining DWR landscape assets through:

- Monitoring to support adaptive management, adaptation
- Research partnerships

Adaptive Management: Needed to maintain, improve sequestration?

- Adaptive management guidance:
- Control invasive species
- Reduce methane, maximize sequestration ⟶
  - Excess biomass removal?
    - Cultural fire
    - Biomass harvesting

NPS Michael Gu

3B Farms, LLC

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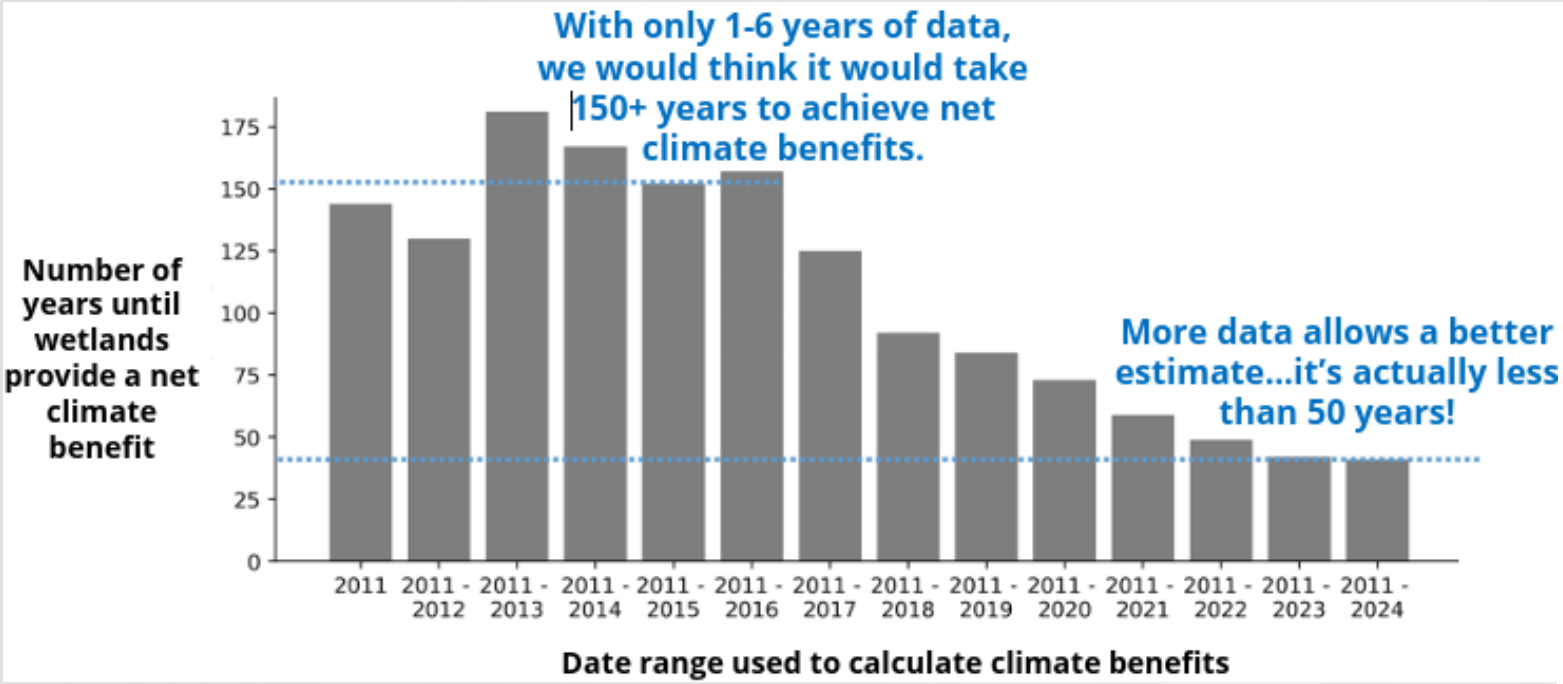
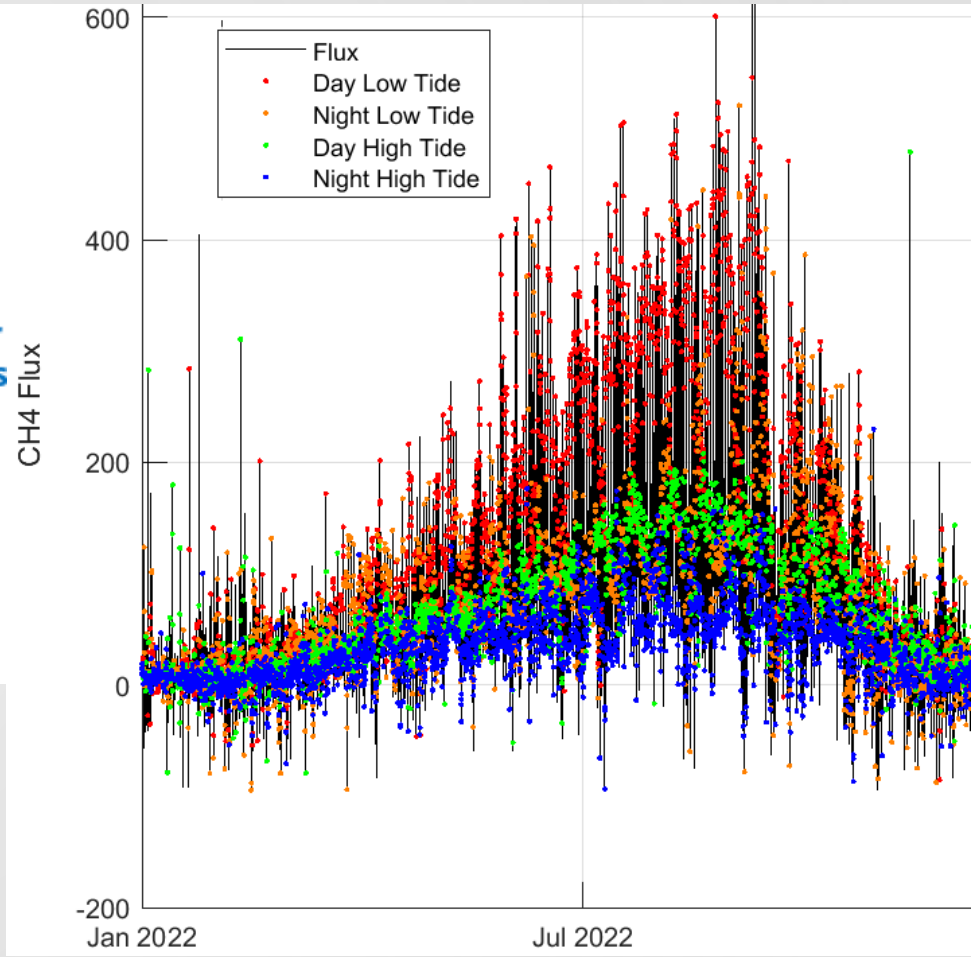
Continuous data allows for actions





- Changes decision-making timescales
- Identifies potential management

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Key to Building Resilience

- +60,000 acres restored habitats in Delta by 2050
- DWR's current commitment: 37,000+ acres by 2030

- Ongoing efforts build resilience:
  - Future investments w/ improved climate analysis (CVFPP 2027 update, Prop 4)
  - ***Monitoring key to adaptation***

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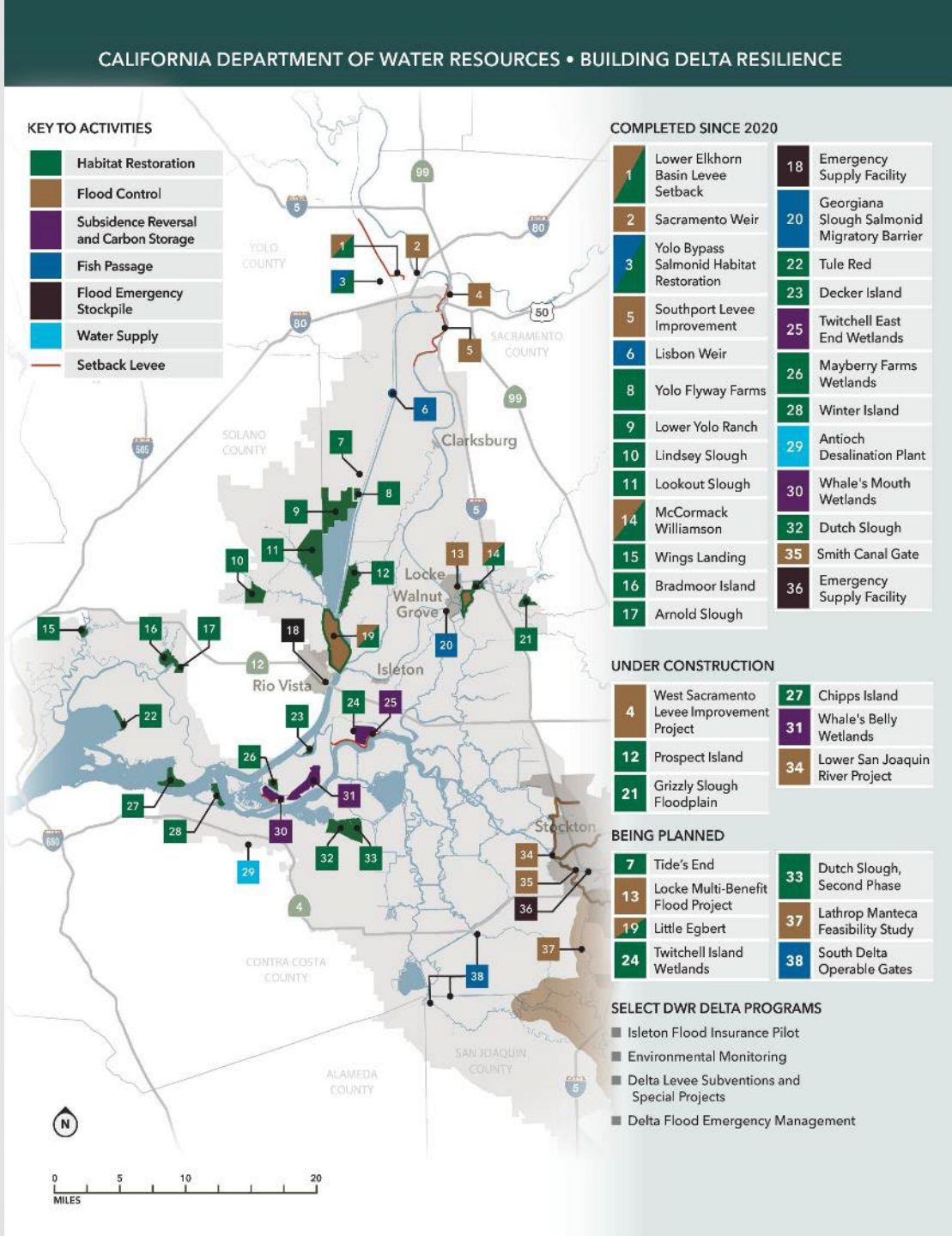

Next steps to a more resilient, climate-smart Bay-Delta: Large-scale coordination

- Scaling carbon monitoring and credit projects
- Private-public partnerships
- Adaptive management guidance
- Lower investment barriers
  - Permitting
  - Assessments
  - Identifying revenue streams

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Conclusions

- DWR is leading restoration with science
- Nature-based climate solutions are working
- Adaptive management is essential
- Partnerships power progress
- Scaling up is the next frontier

Acknowledgements

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