Solutions for the sinking Delta

from research to implementation

Drainage for agriculture

Weir et al 1950

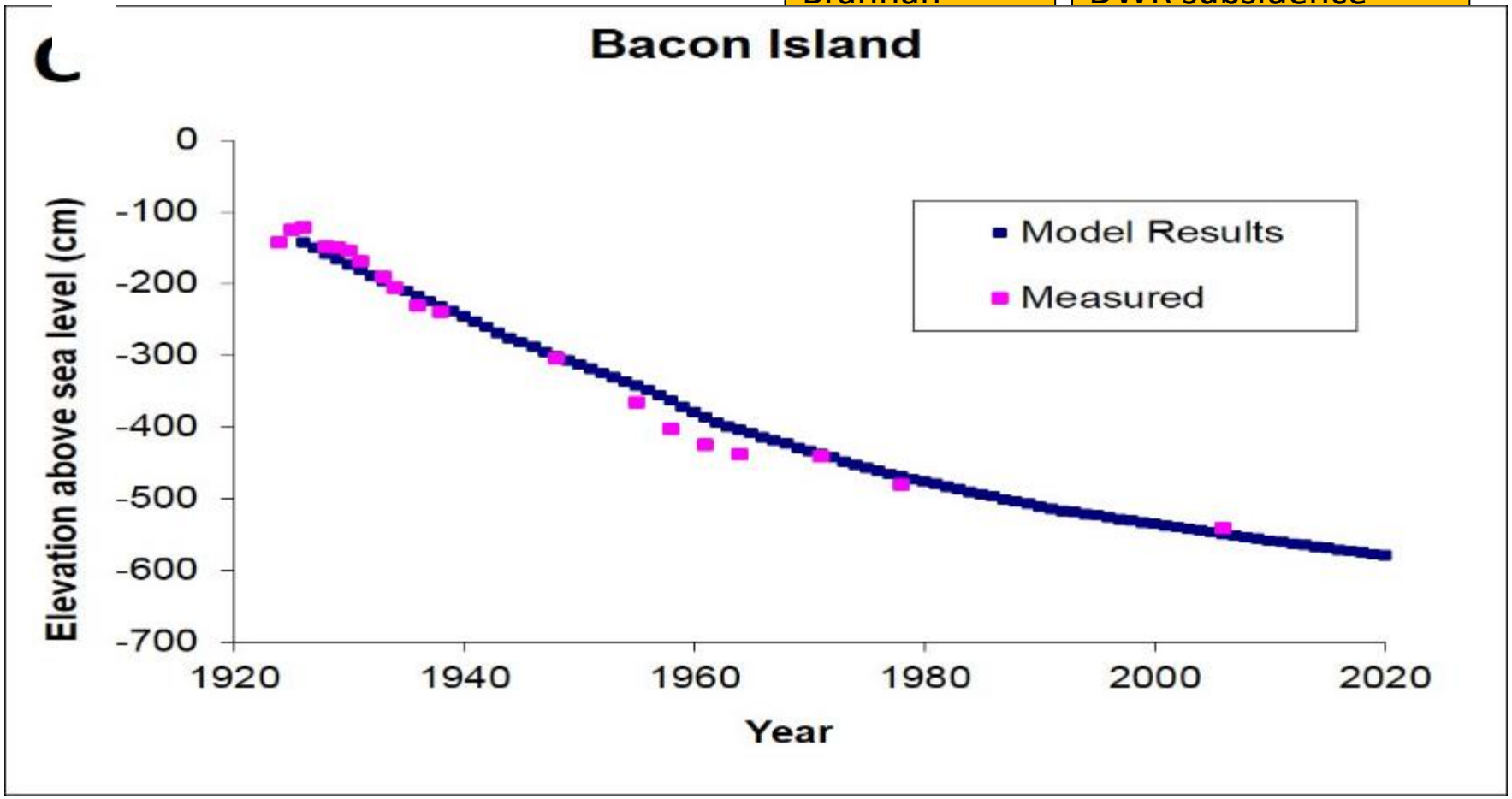
DWR oxidation, gw control

causes, reversal

1900 1920 1940 1960 1980 2000 2020

Brannan-

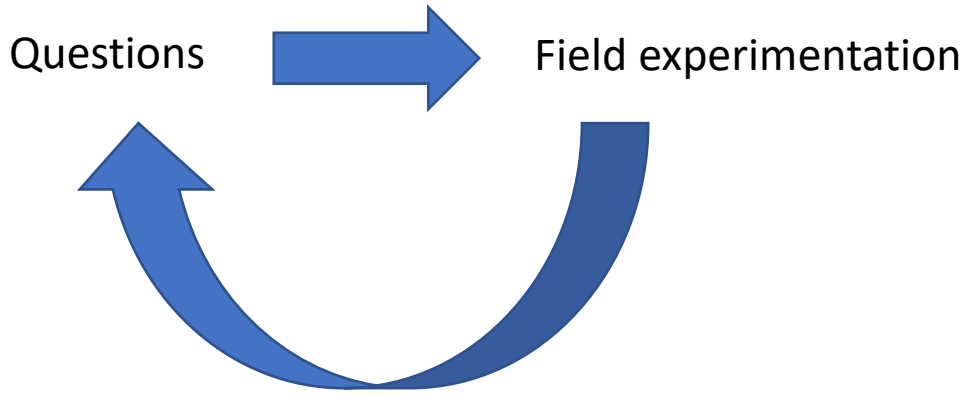
DWR subsidence



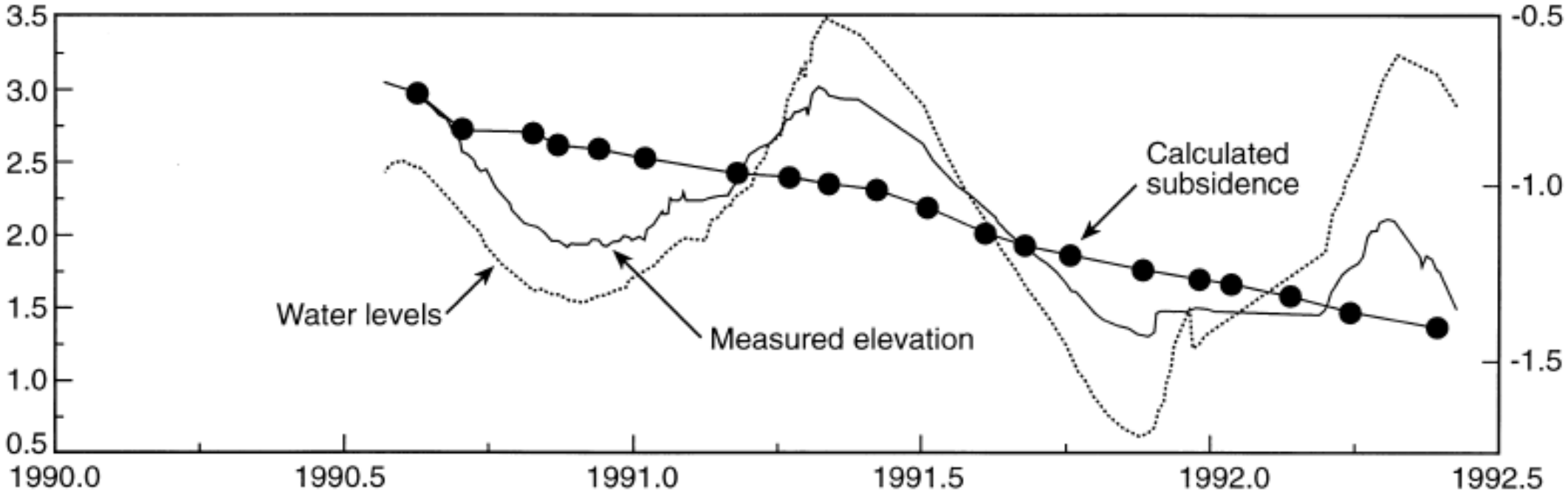
Deverel, Steven J, & Leighton, David A. (2010). Historic, Recent, and Future Subsidence, Sacramento-San Joaquin Delta, California, USA. *San Francisco Estuary and Watershed Science*, 8(2).: http://www.escholarship.org/uc/item/7xd4x0xw

Science
Practice

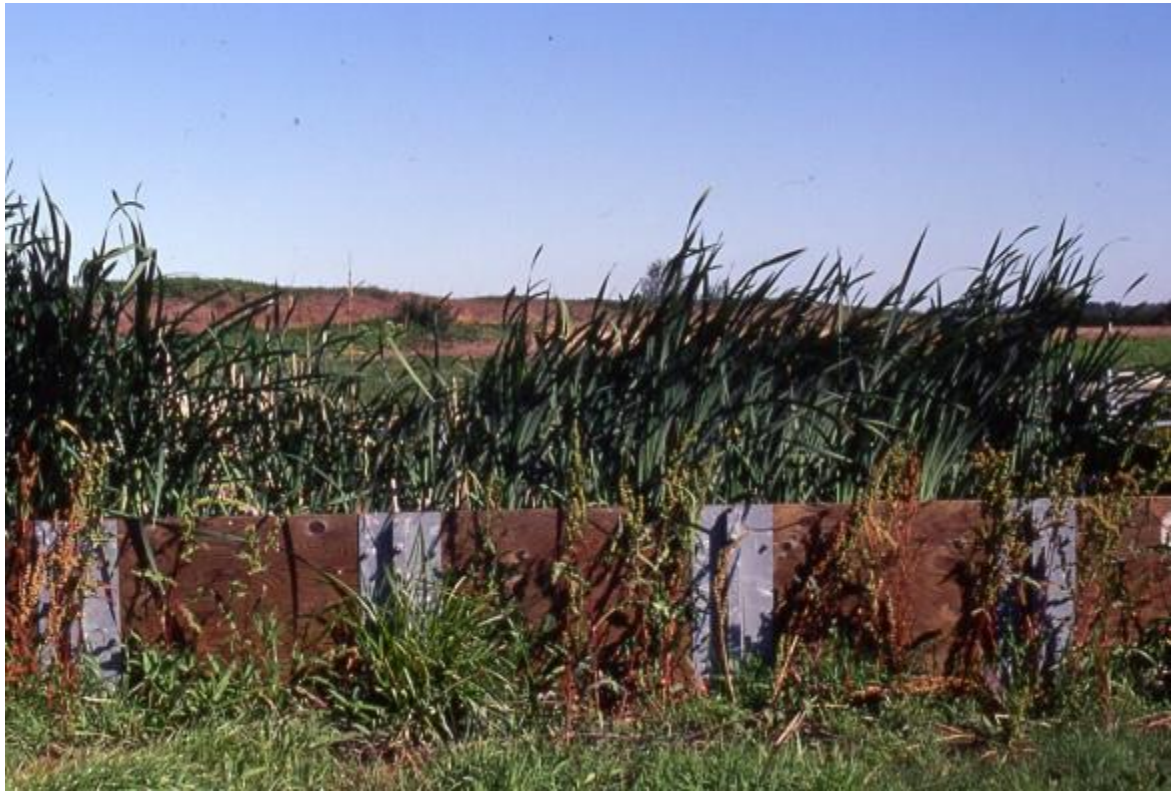
Interweaving of science and implementation



Subsidence = carbon loss



Deverel and Rojstaczer, 1996, Subsidence of agricultural lands in the Sacramento-San Joaquin Delta, California: Role of aqueous and gaseous carbon fluxes. Water Resources Research, 32, 2359 - 2367



Subsidence reversal/carbon capture wetlands

- Deverel et al. 1998, Subsidence Proceedings of the Joseph Poland Subsidence Symposium, Association of Engineering Geologists, Special Publication No. 8.
- Miller et al., 2000. H. *U.S. Geological Survey Water-Resources Investigations Report* 2000-4042, 21p.

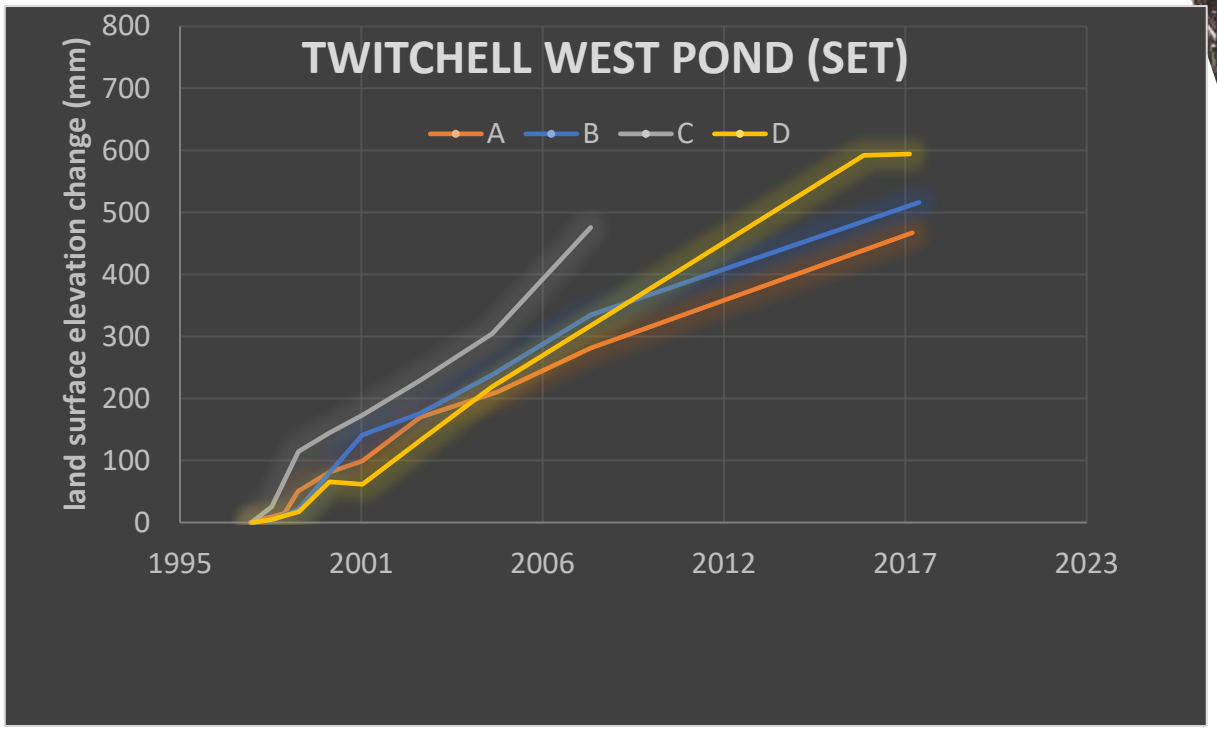
Twtichell Island pilot wetland

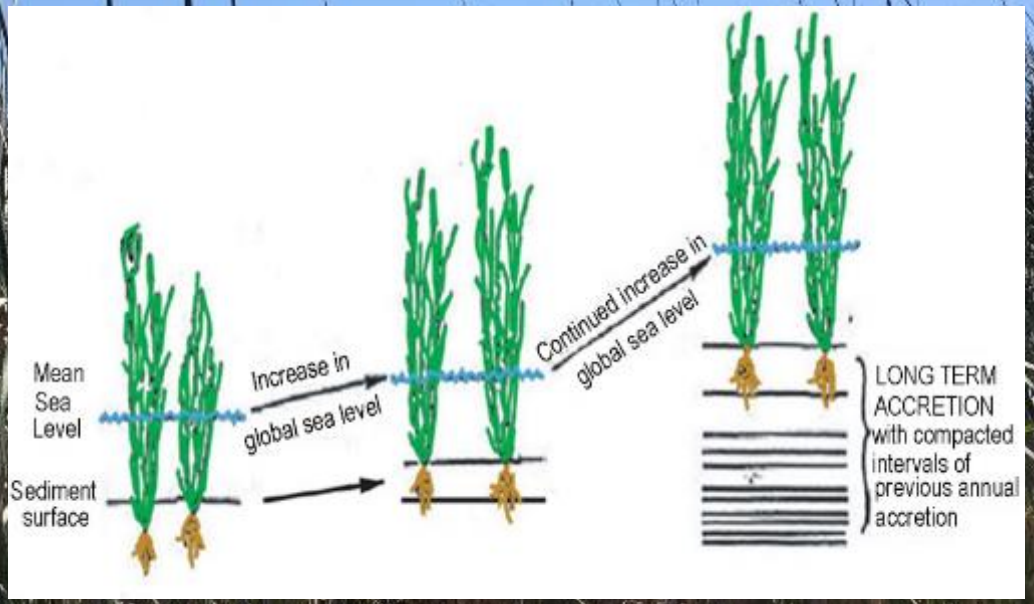
- Two 7 acre wetlands, established in 1997

Miller et al. 2008, SFEWS

Twitchell Island Pilot Wetland

- Accreted about 3 cm per year

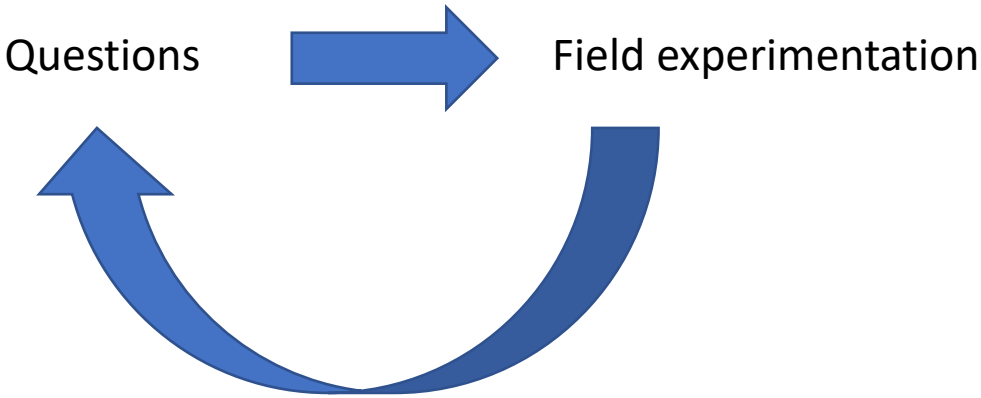




Deverel et al. 2020, Proc. IAHS, 382, 837–842, 2020
https://doi.org/10.5194/piahs-382-837-2020

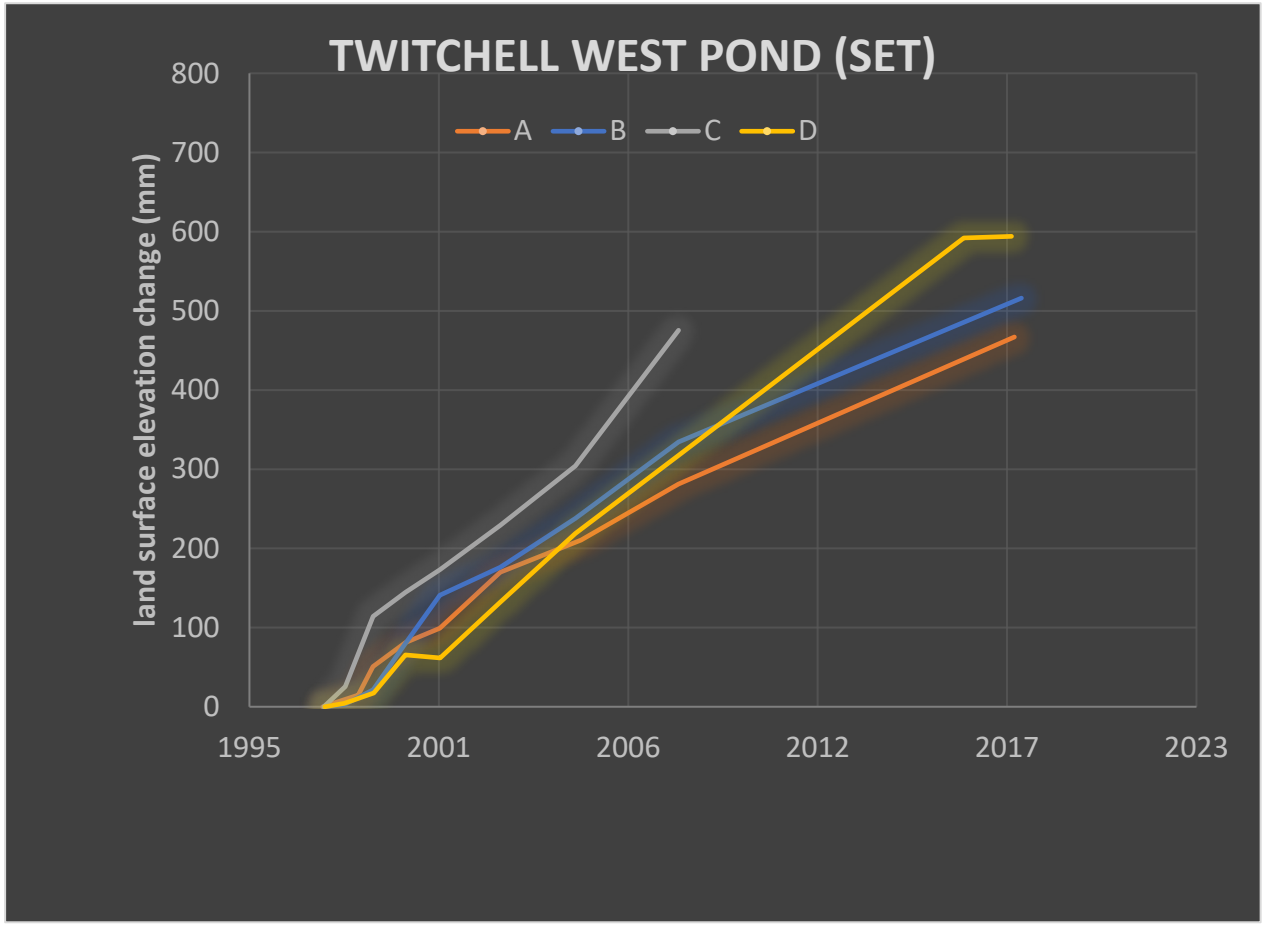
Accreted biomass

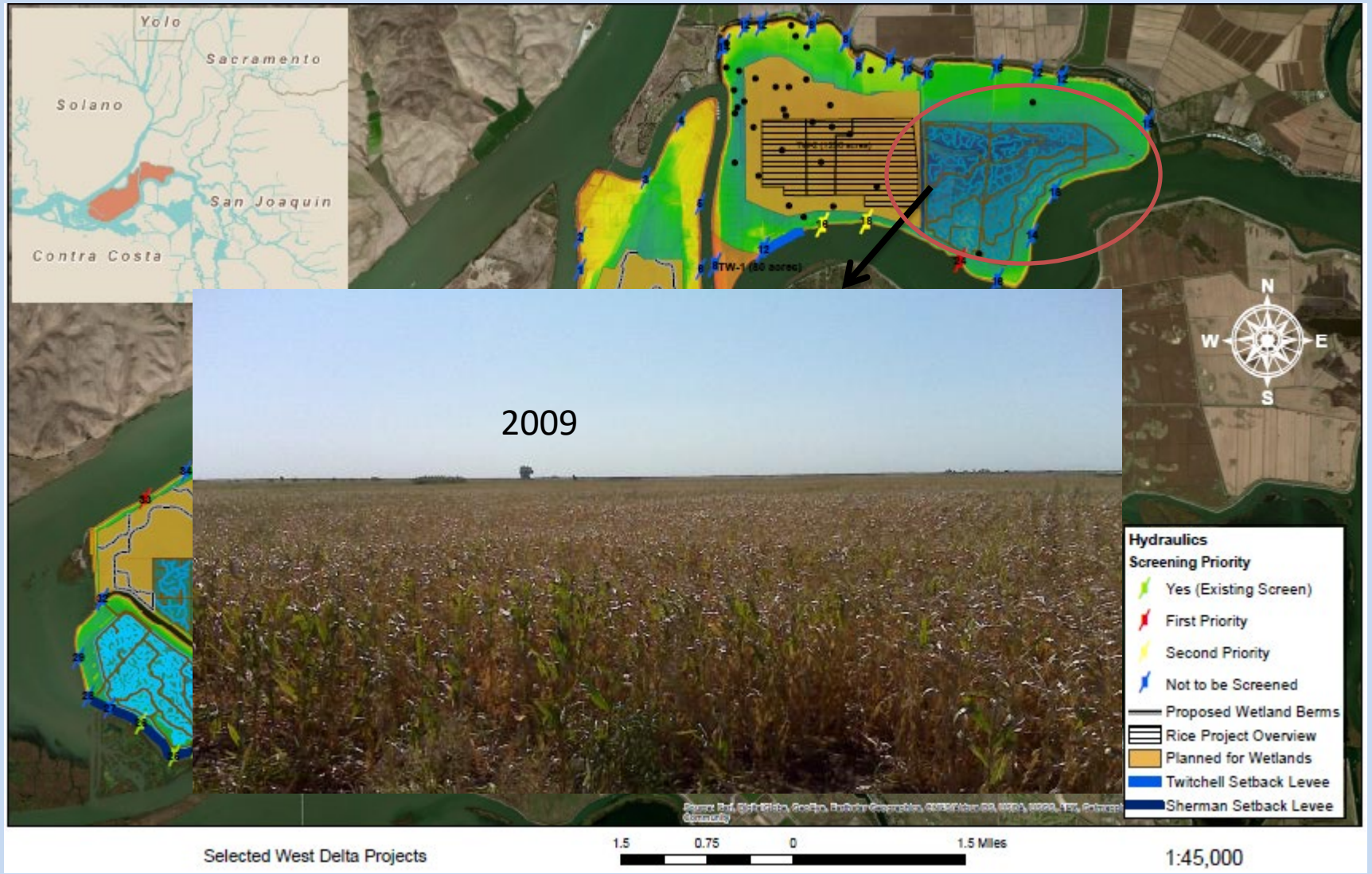
Interweaving of science and implementation



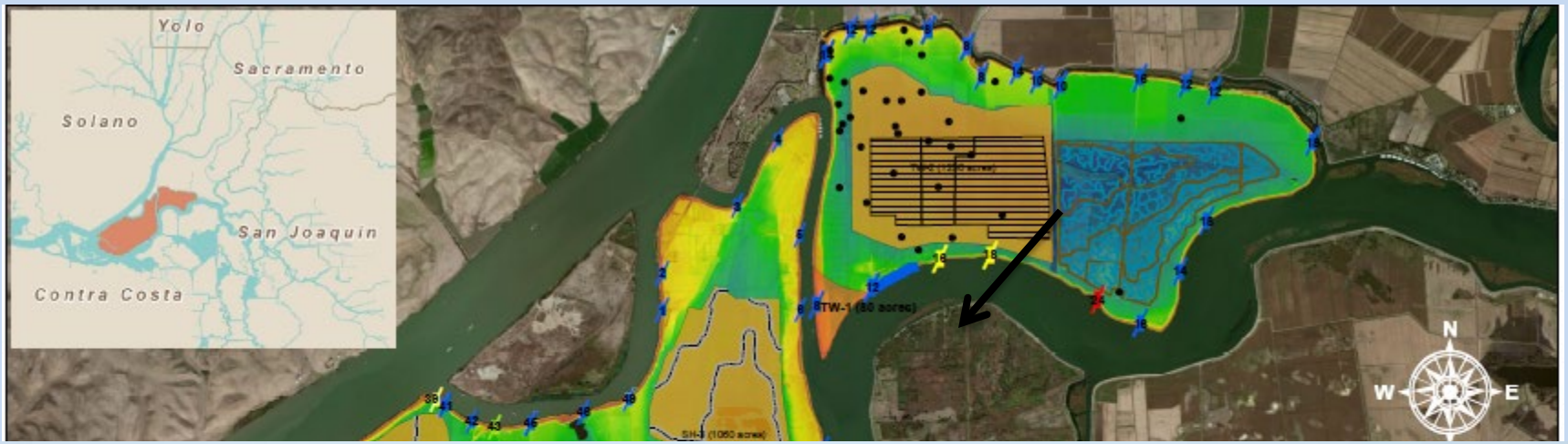
Continued research/implementation

- Sherman and Twitchell conversion
- Quantification of GHGs (UC Berkeley, HydroFocus)
- Carbon market (Delta Conservancy, HydroFocus)





Agriculture to wetland conversion



2015

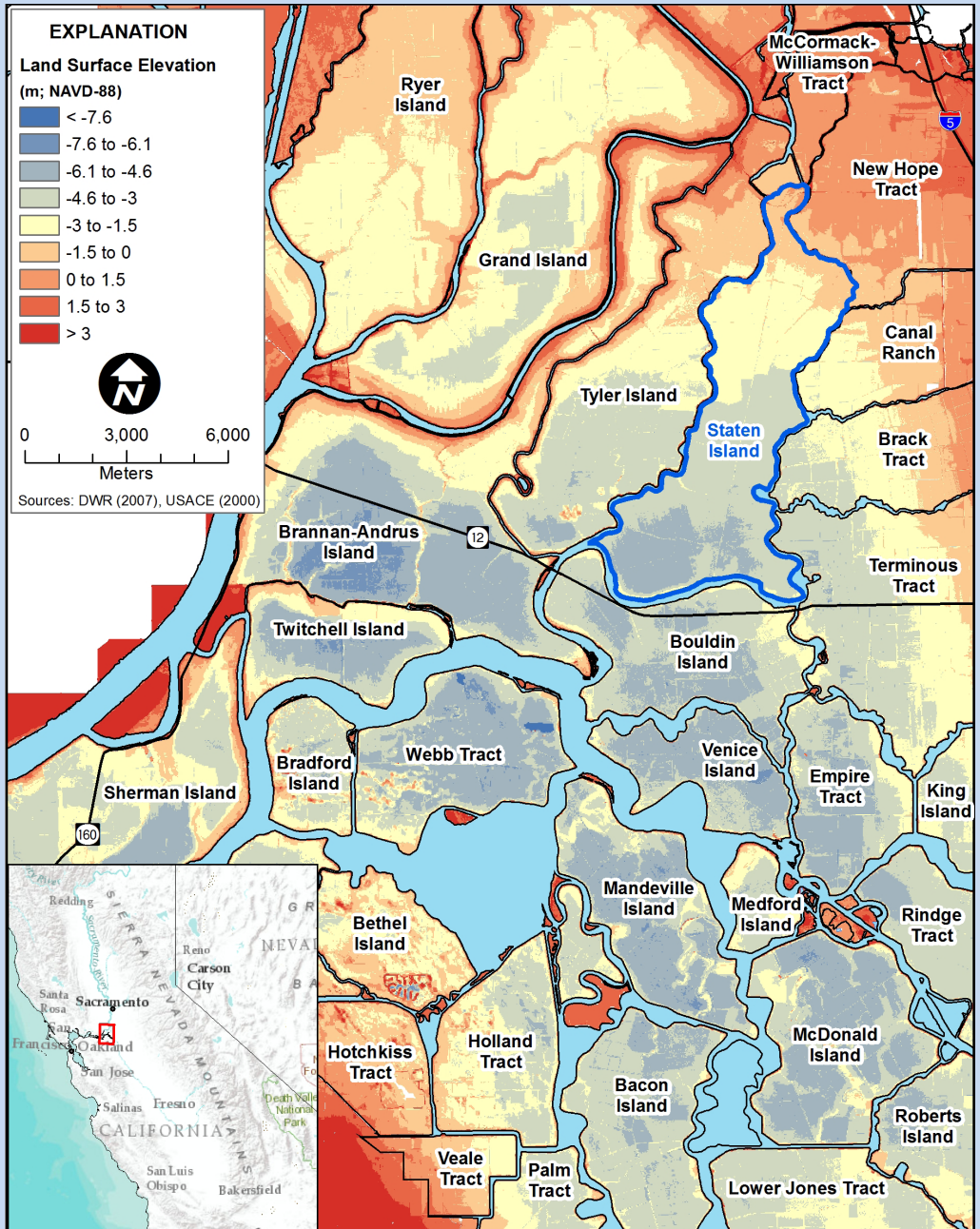
First ever wetland carbon offsets

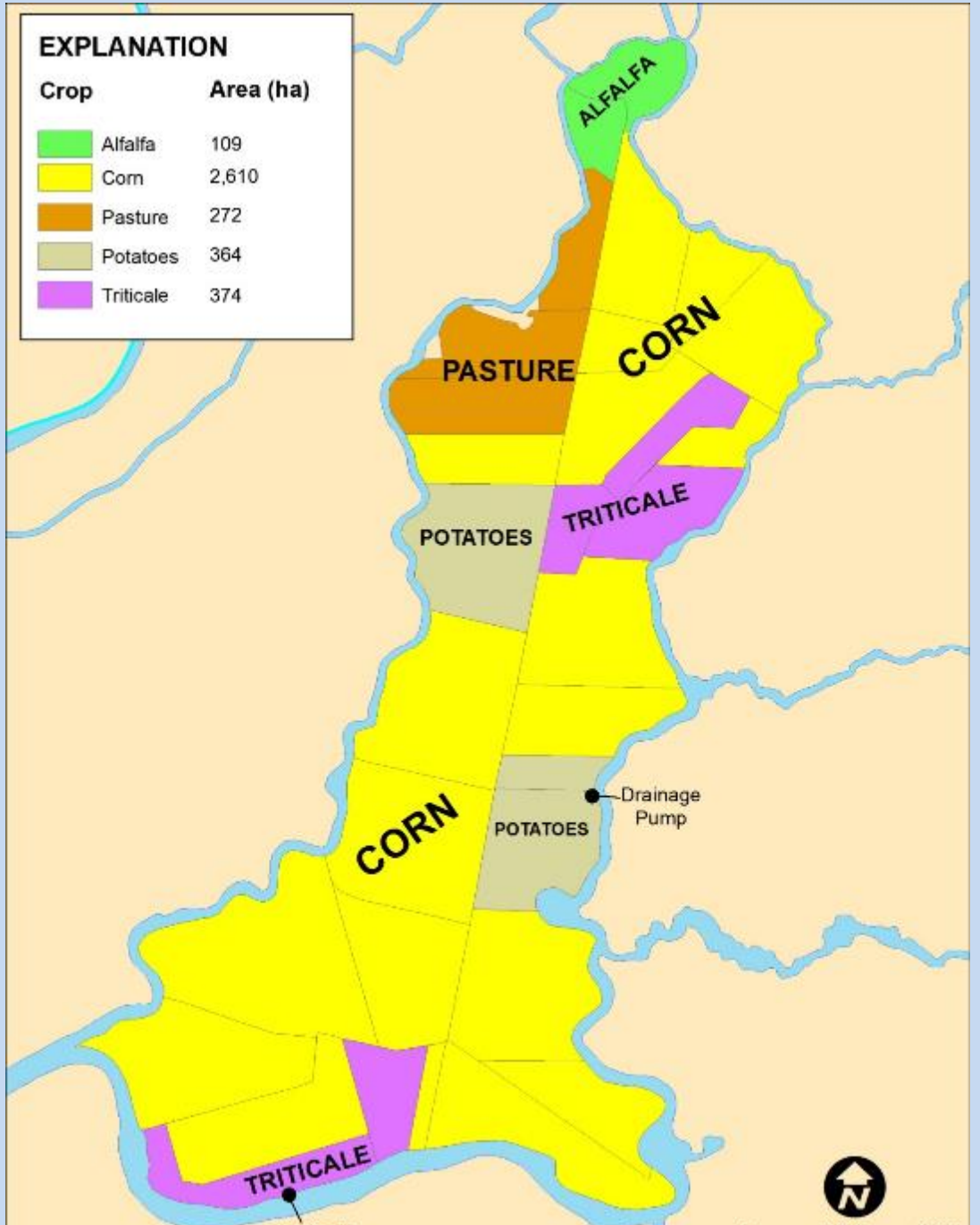
Certified by the American Carbon Registry in 2020

52,106 tons carbon dioxide equivalents

for conversion to managed wetlands on 690 ha

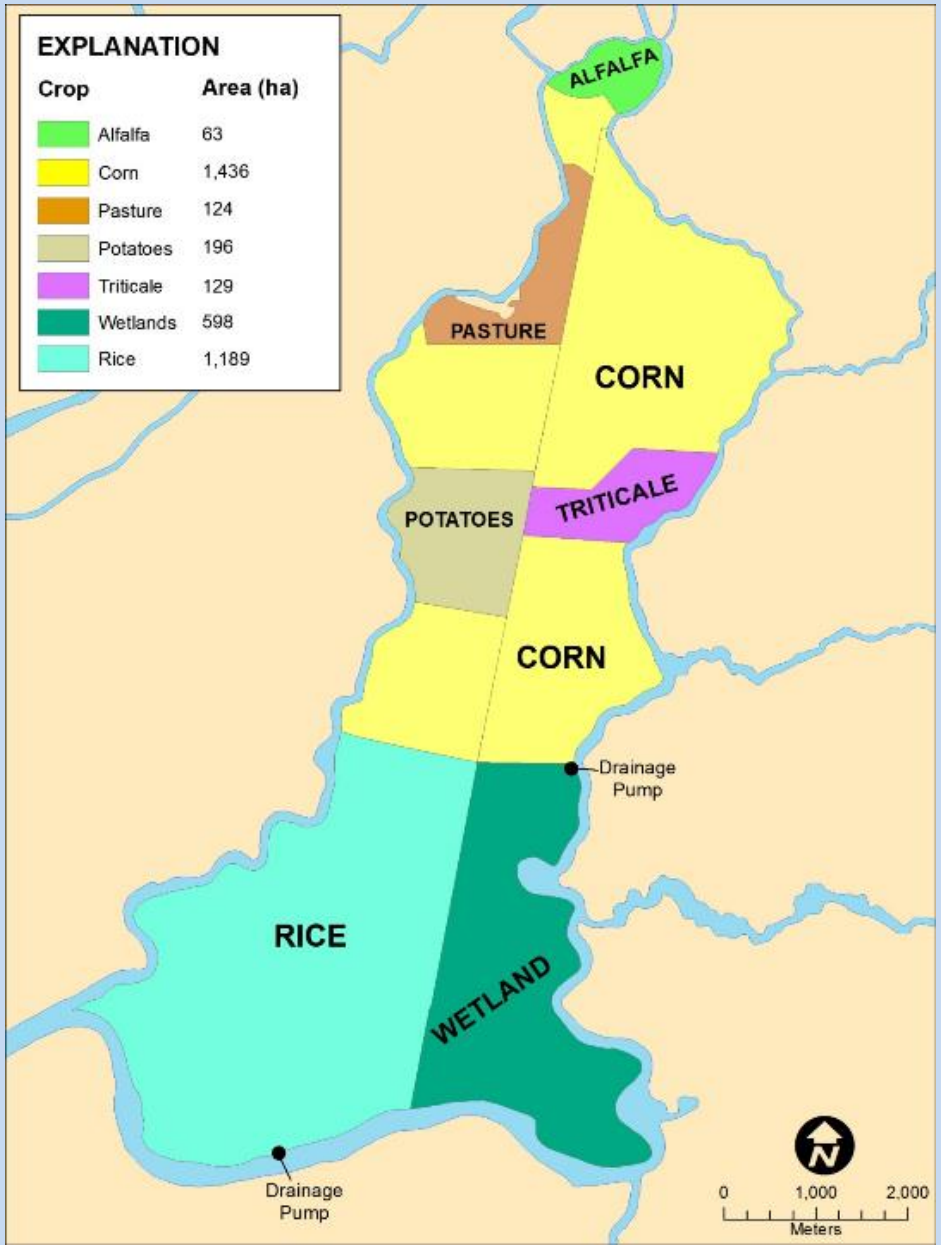
Staten Island



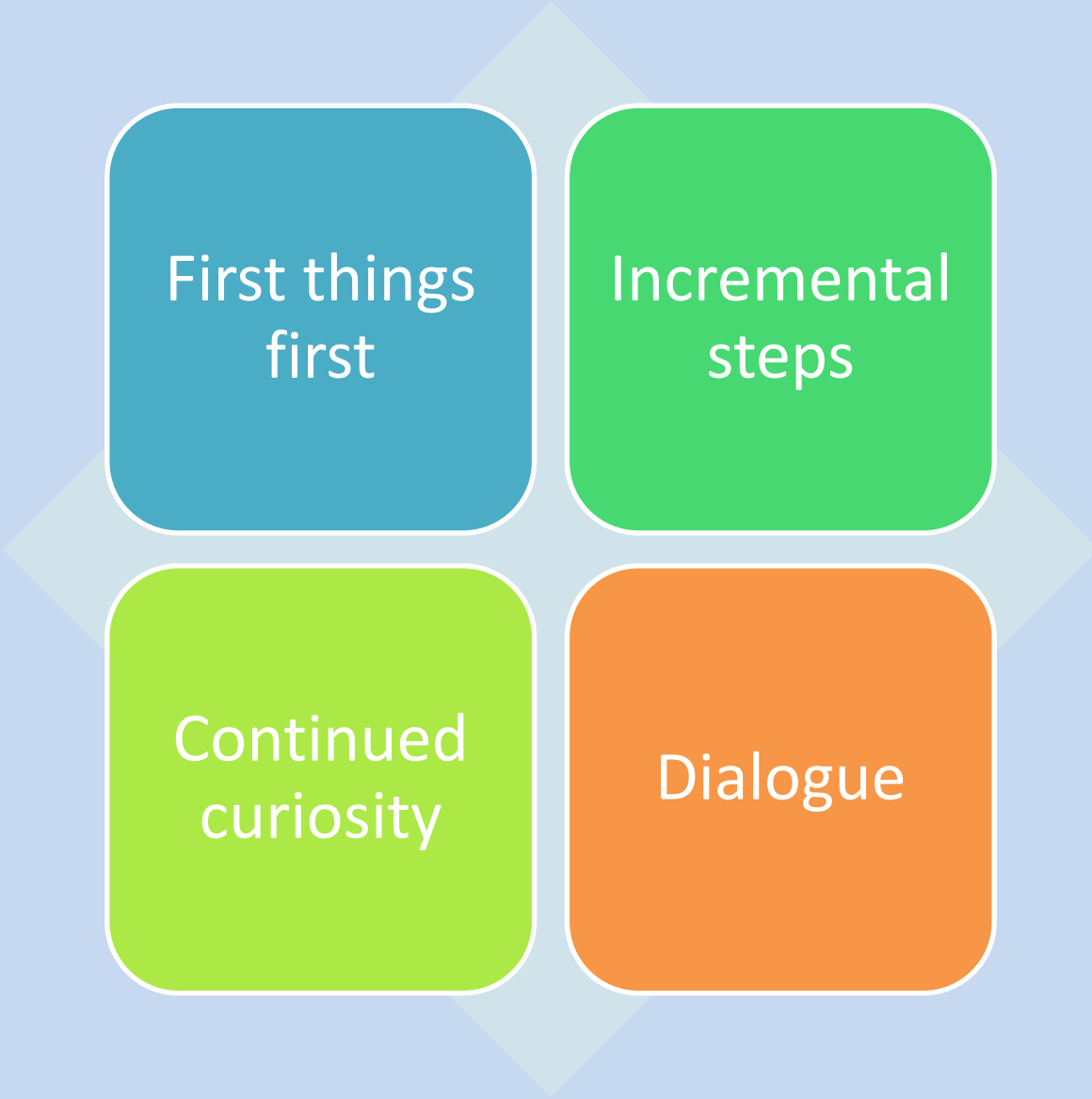


Staten Island Mosaic (Deverel et al. 2017, https://escholarship.org/uc/item/99z2z7hb)

- 60 % reduction in GHG emissions
- Slight decrease in profitability



Lessons learned



Science
Practice