Drought Barrier Efficacy and Impacts

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DWR Delta Modeling Section
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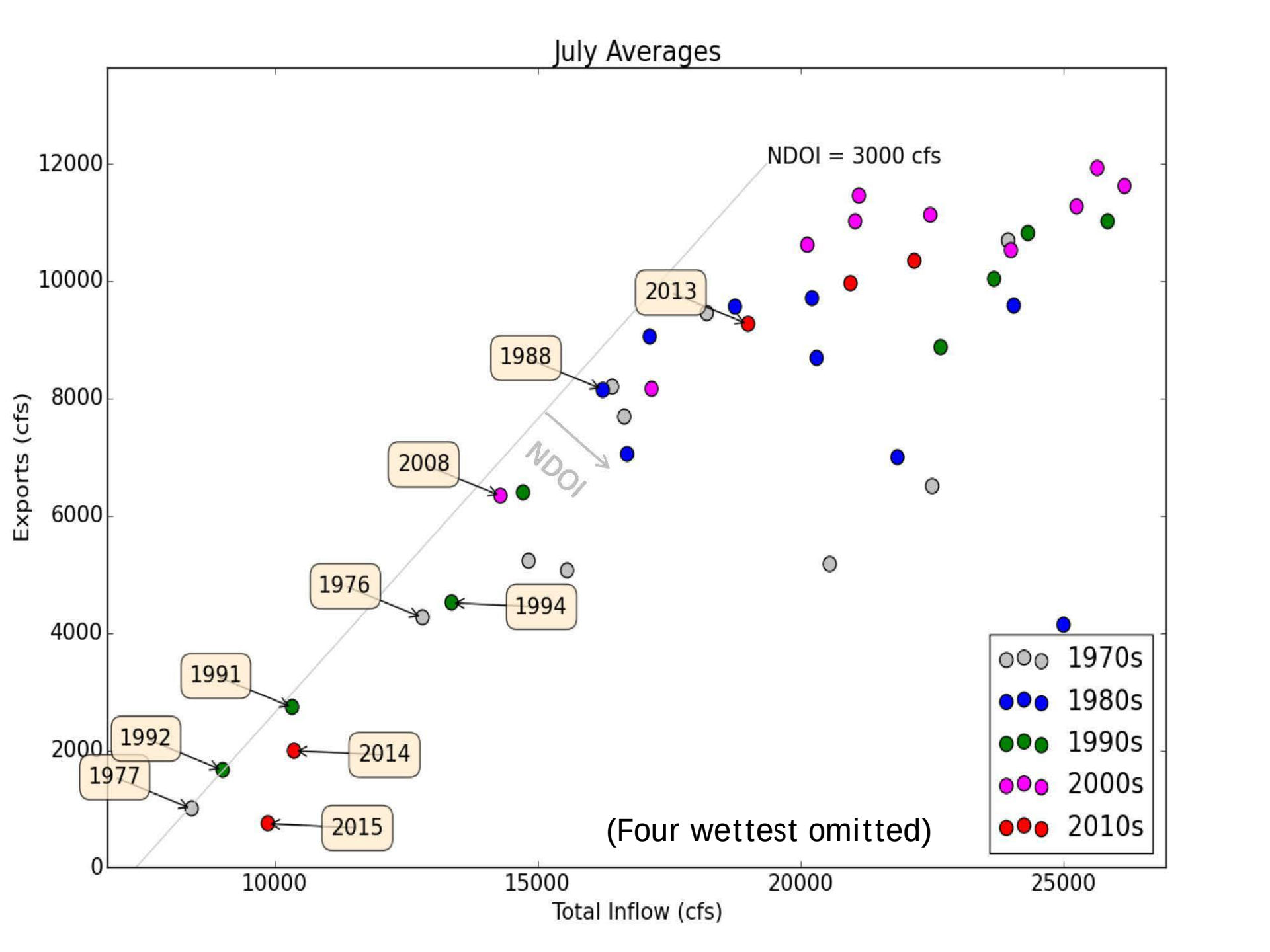
EDB Context and Concept

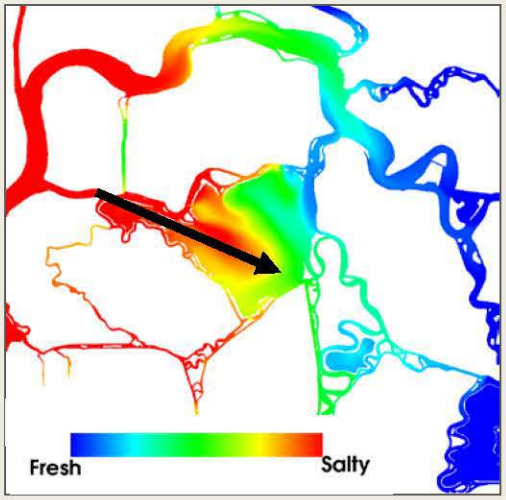

July Averages
NDOI = 3000 cfs
NDOI
2013
1988
2008
1976
1994
1991
1992
1977
2014
2015
(Four wettest omitted)
1970s
1980s
1990s
2000s
2010s
Exports (cfs)
Total Inflow (cfs)
0
2000
4000
6000
8000
10000
12000
10000
15000
20000
25000

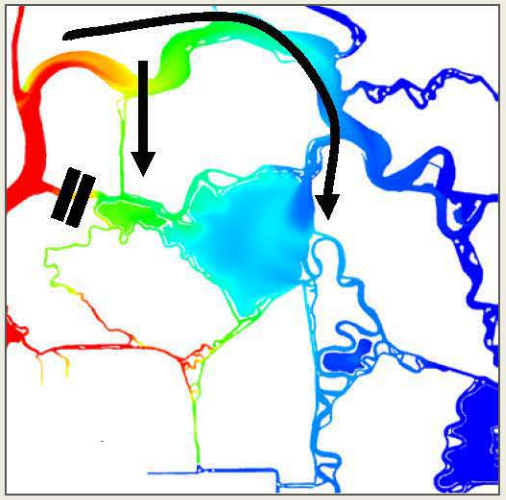
Tidal Pumping

No Barrier

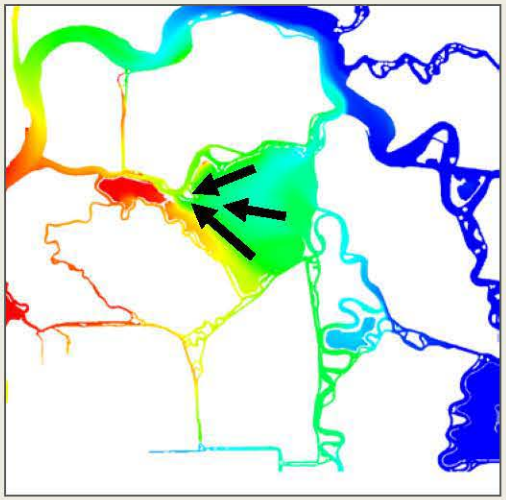
Barrier

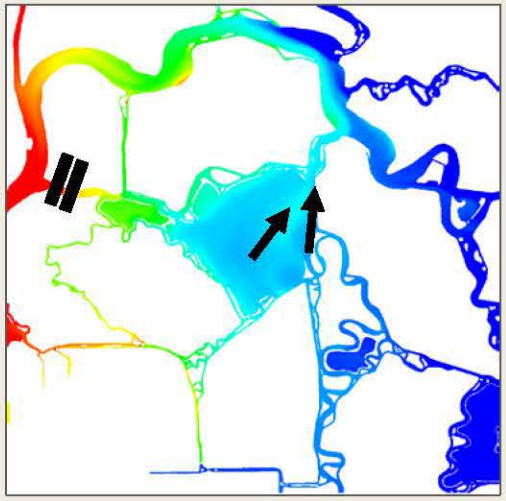
Flood





Ebb

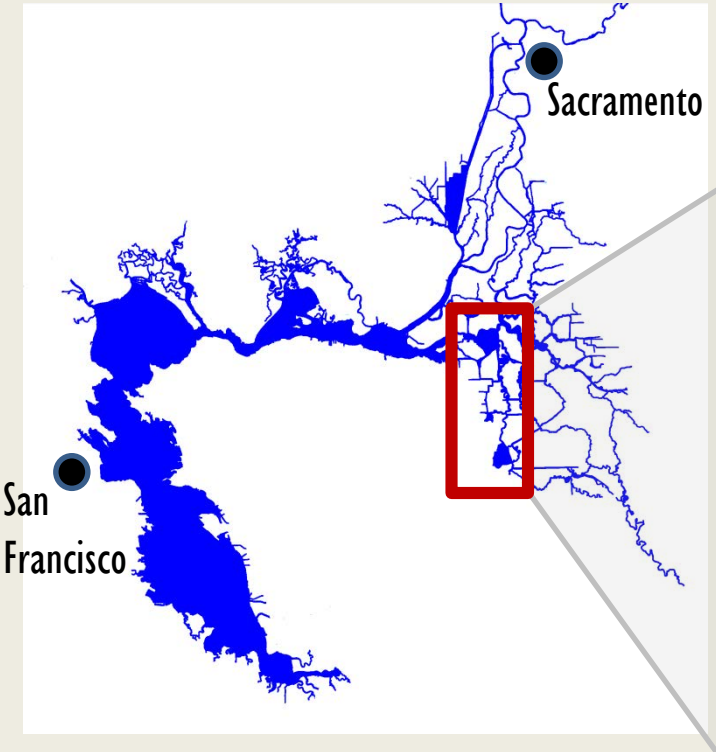


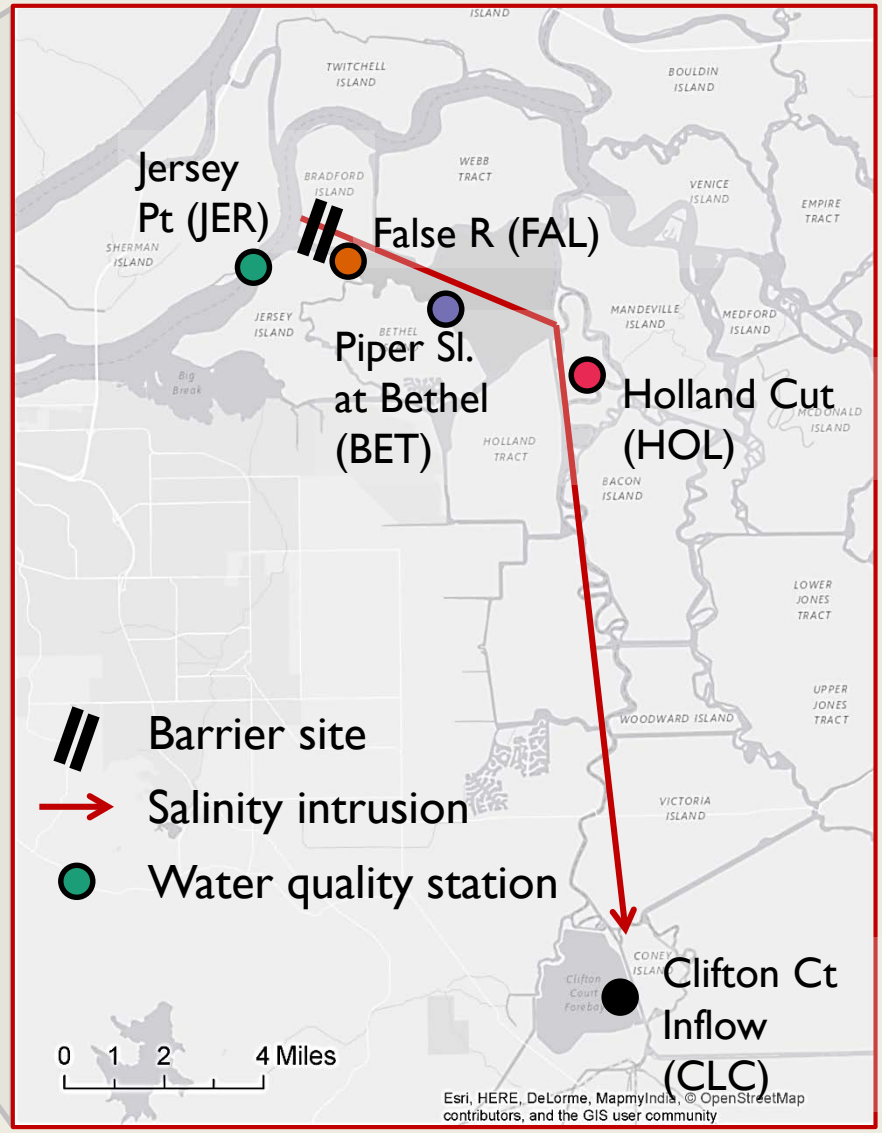


Bay-Delta SCHISM Model, 2014 Low NDOI Forecast

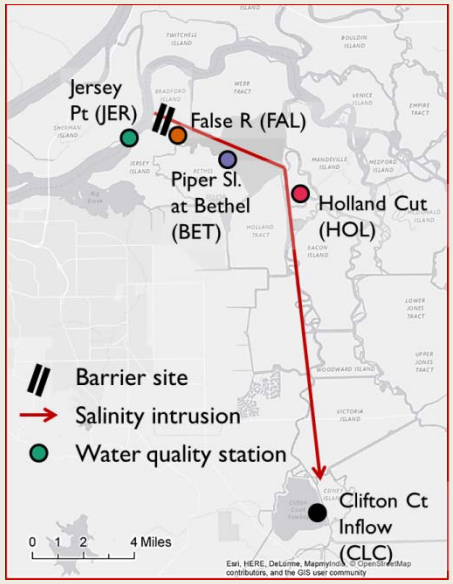
Efficacy

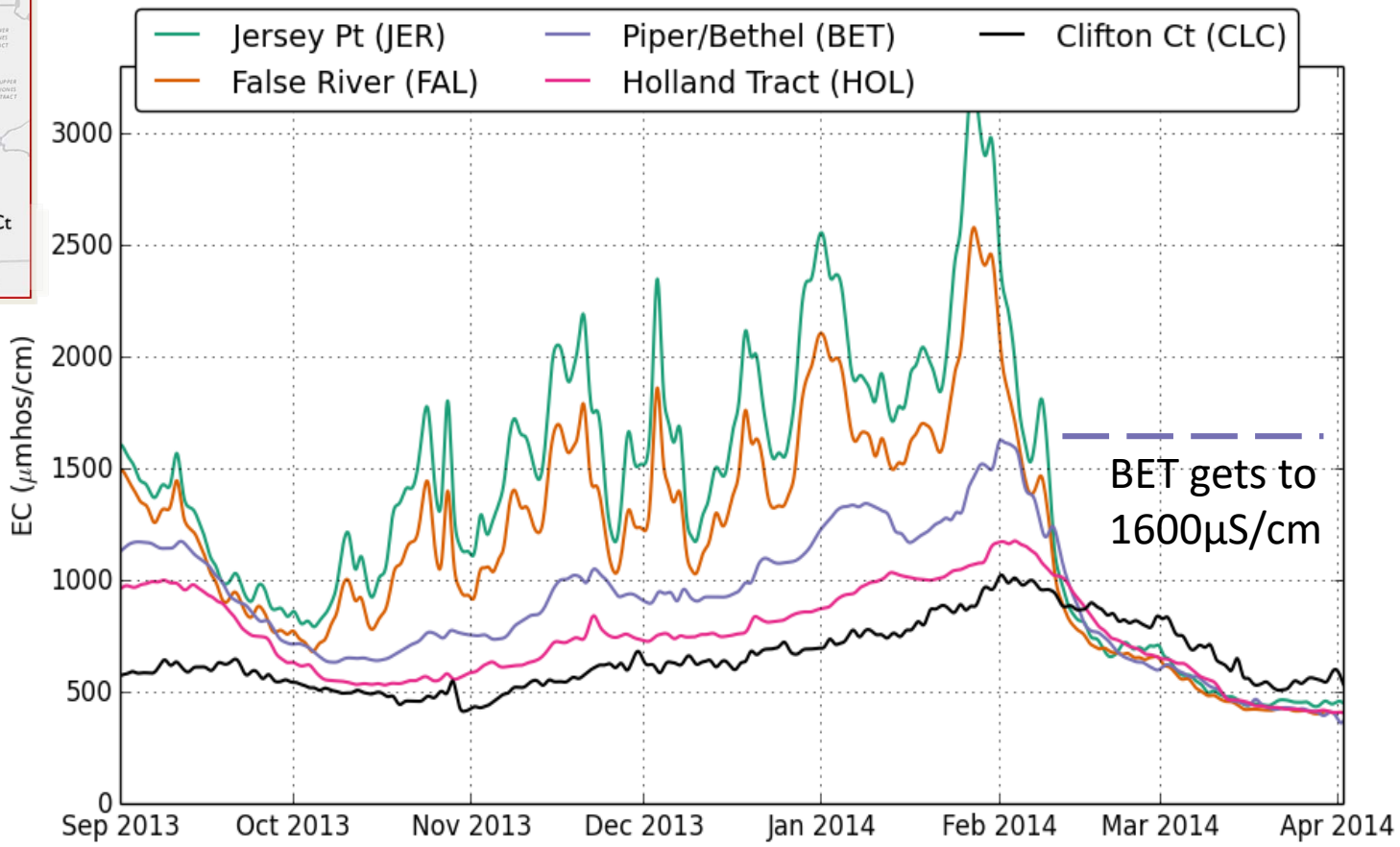
Salinity Propagation





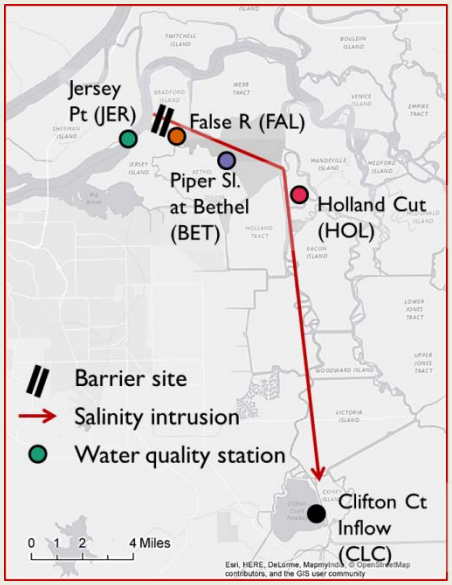
Salinity Intrusion 2014 (no barrier)

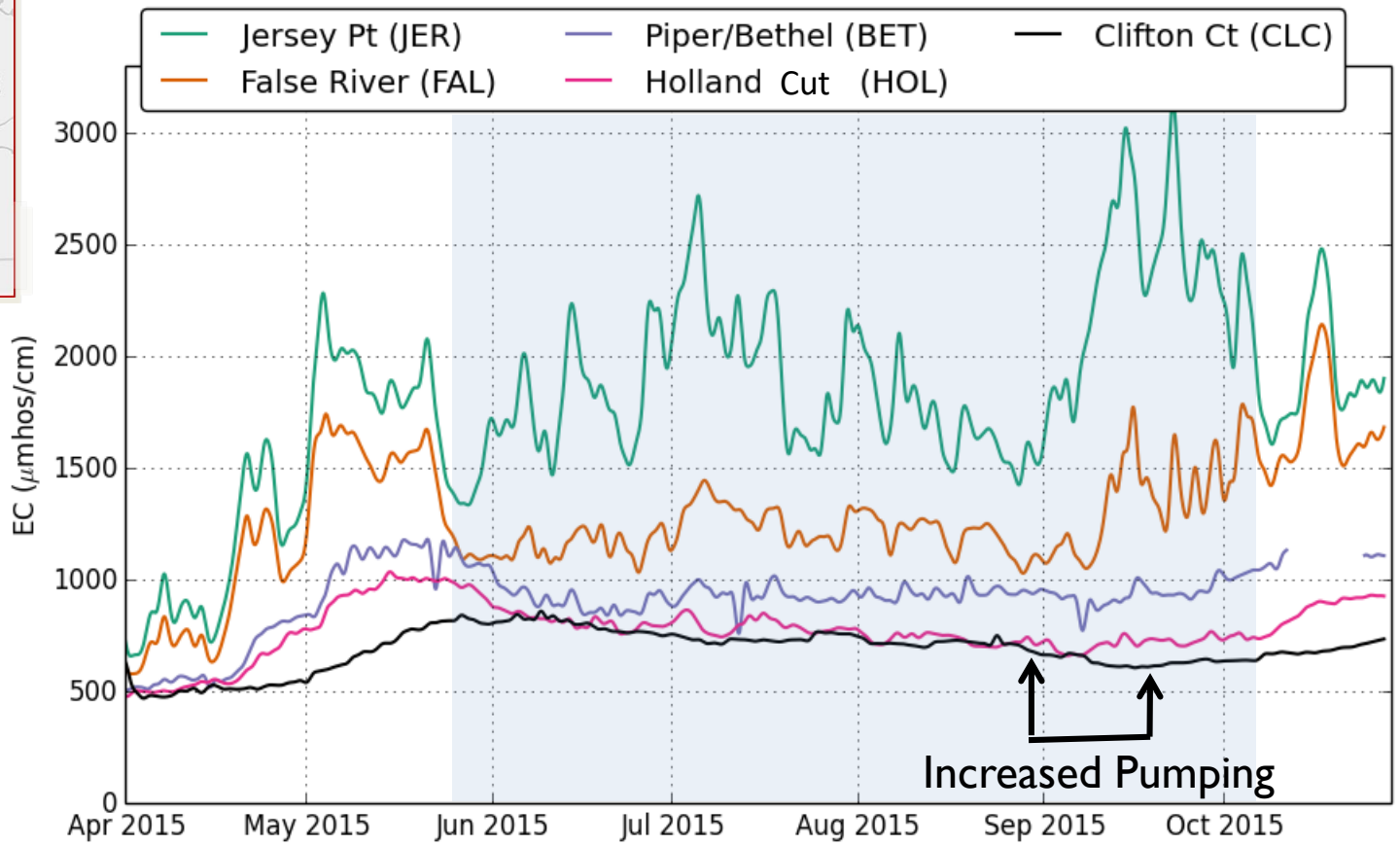




Tidally filtered observations

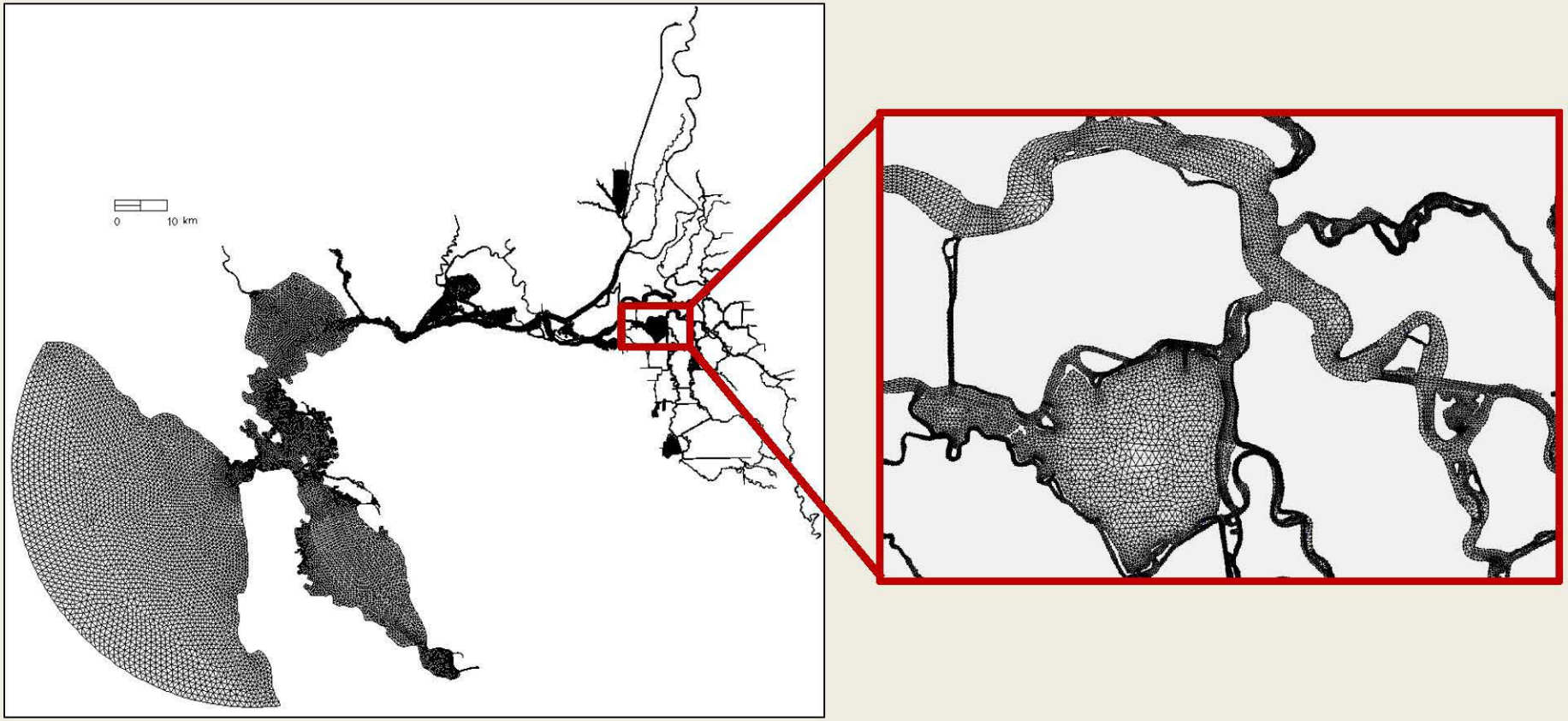
Salinity Intrusion 2015 (barrier)



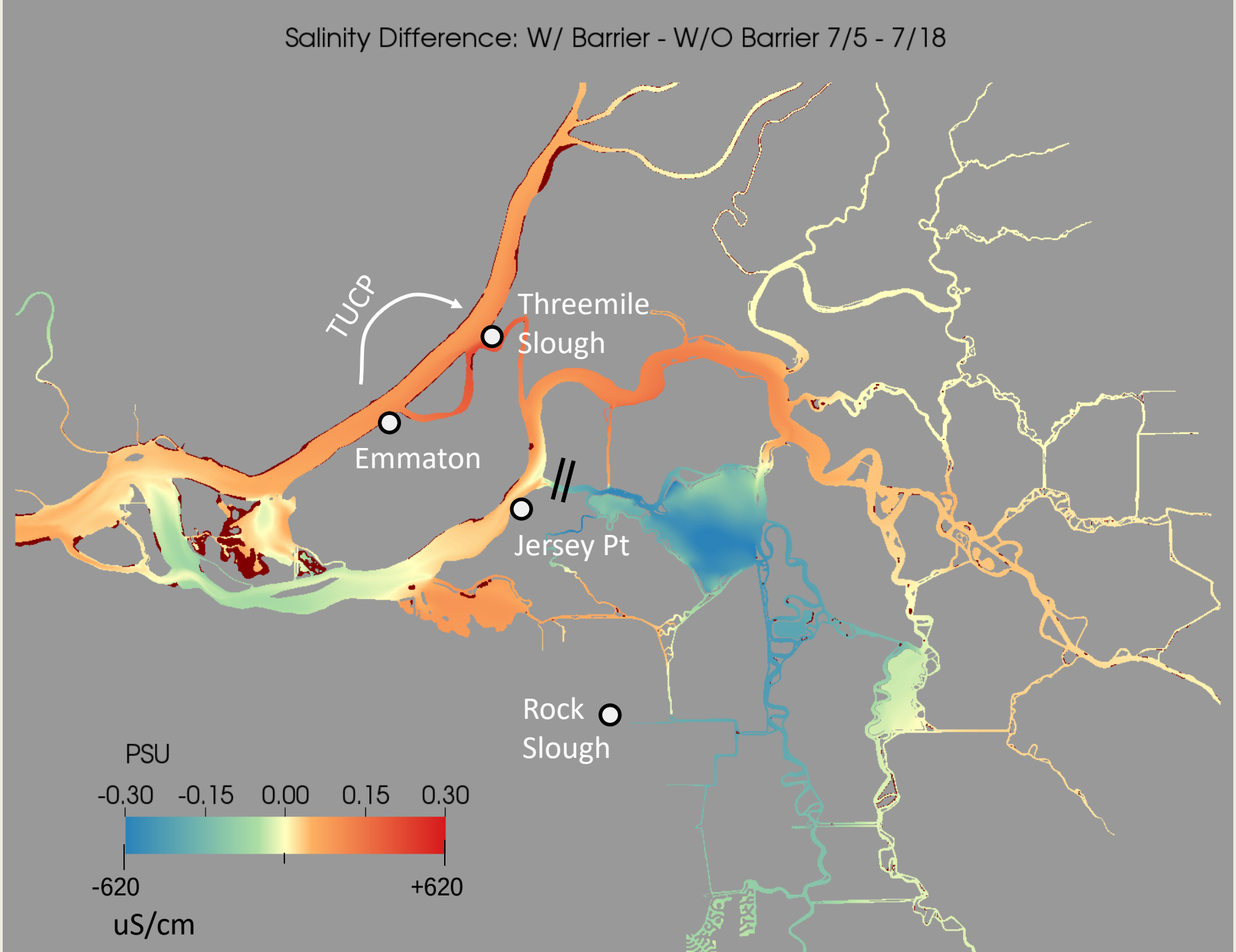


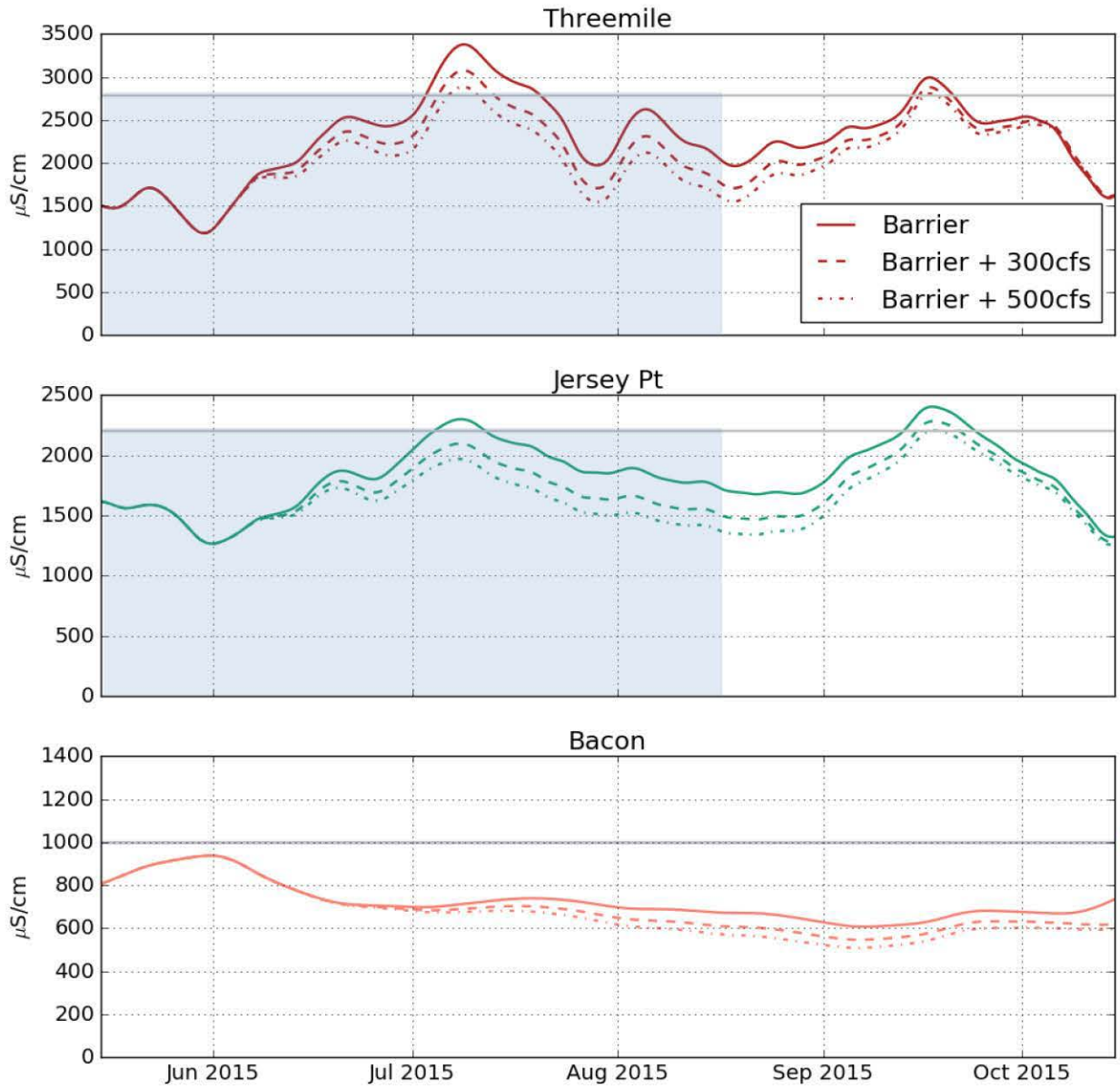
Tidally filtered observations

Model Comparisons



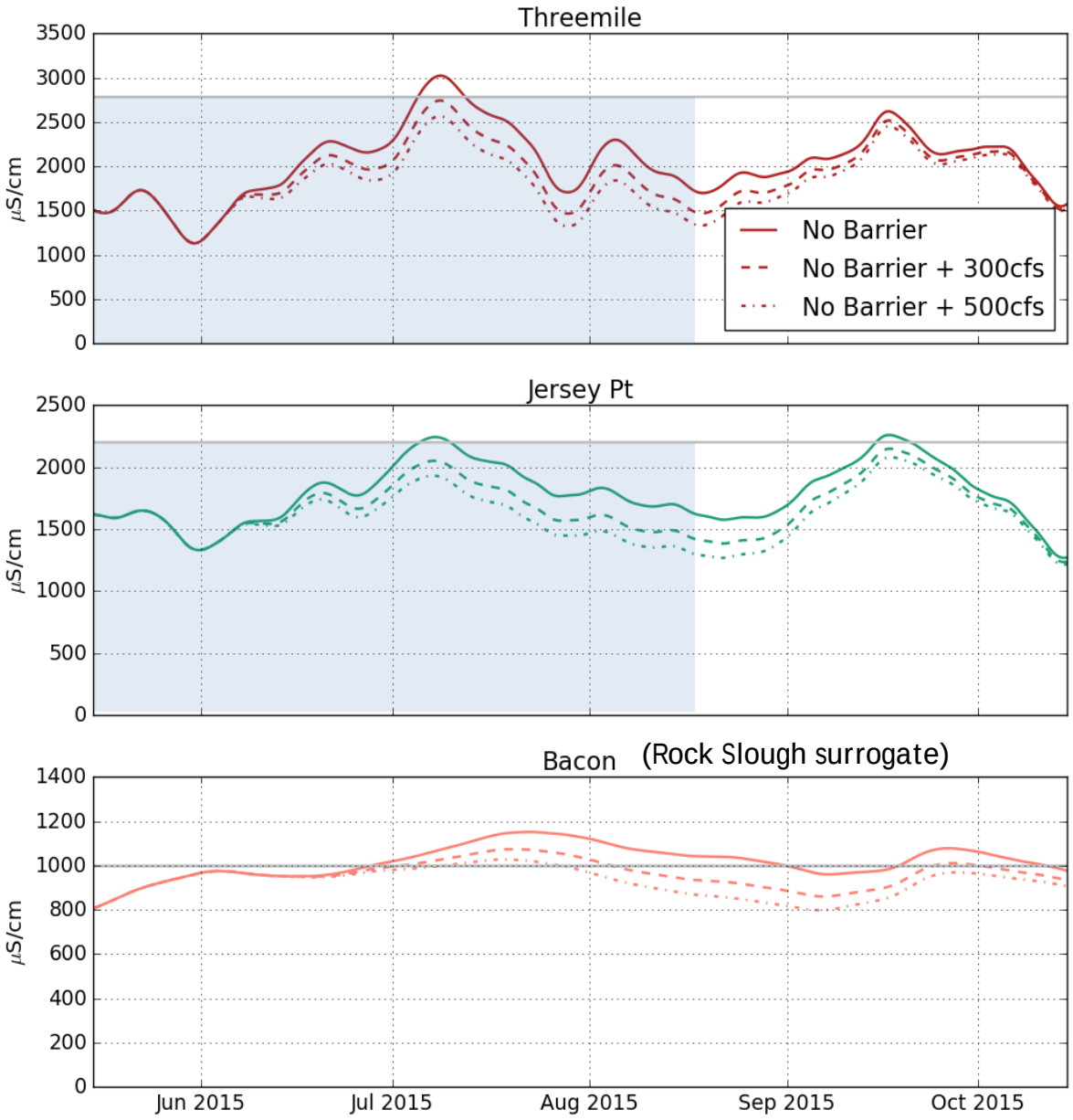
Bay Delta SCHISM 3D


Salinity Difference: W/ Barrier - W/O Barrier 7/5 - 7/18
TUCP
Threemile Slough
Emmaton
Jersey Pt
Rock Slough
PSU
-0.30
-0.15
0.00
0.15
0.30
-620
+620
uS/cm



Objectives

Compliance tradeoff: Bay-Delta SCHISM model with barrier



Objectives

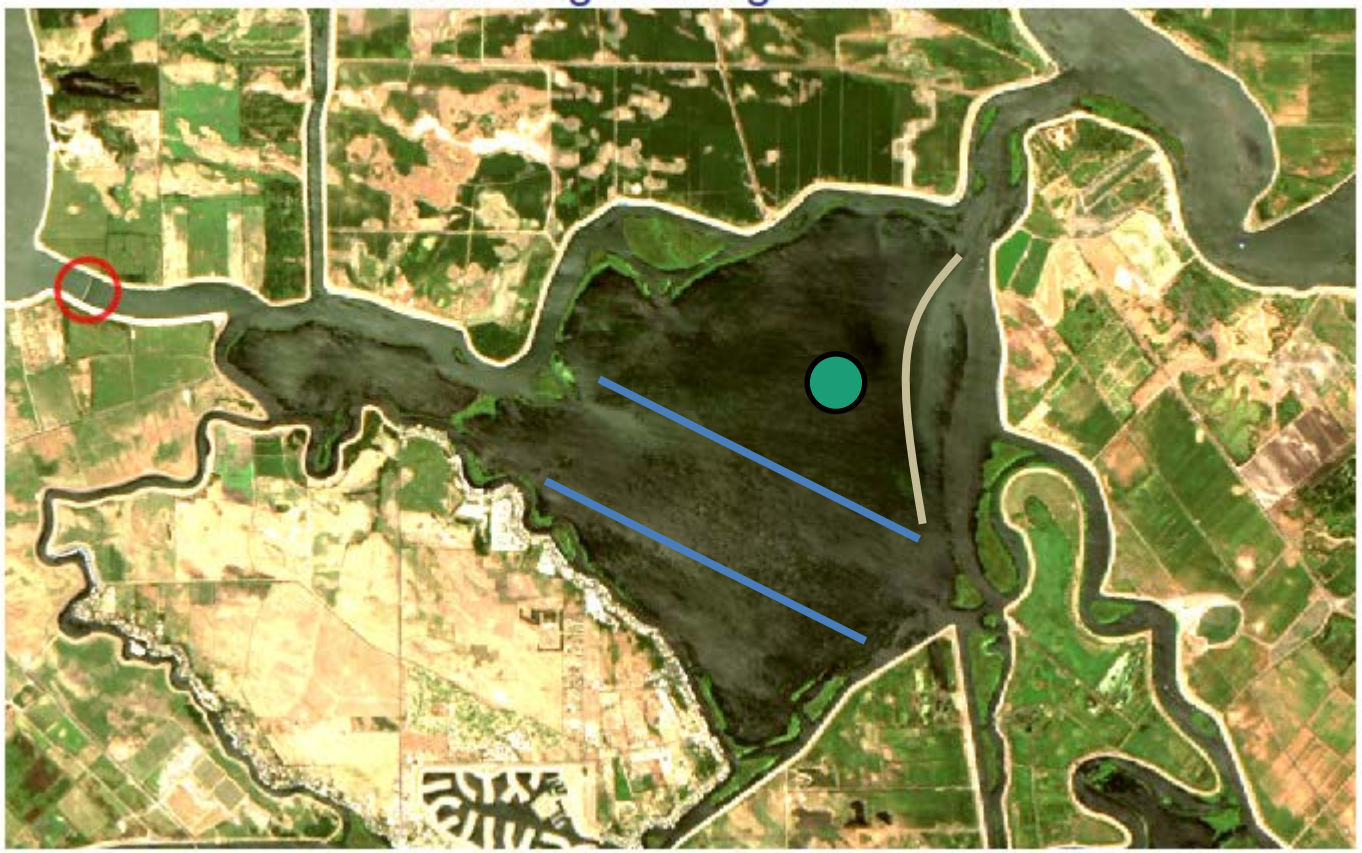
Compliance tradeoff: Bay-Delta SCHISM model without barrier

Quirks and Confounders

- Low Old/Middle mixing with low pumping
- Leakage (2000cfs / 60 cms)
- Barrier install time
- Wind/SAV limit lateral mixing in Franks Tract

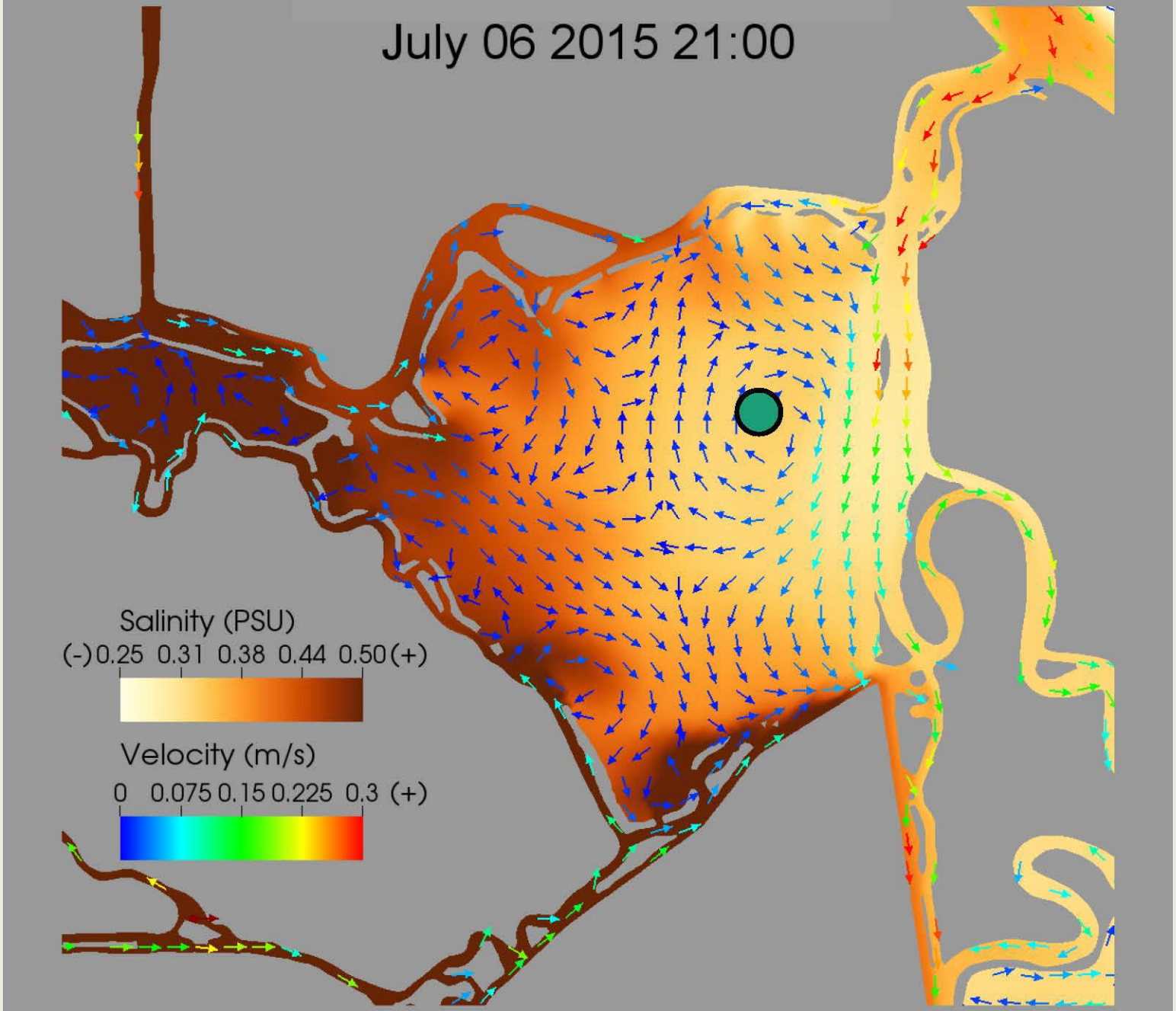
LS-8 OLI Franks Tract Aug 12, 2015

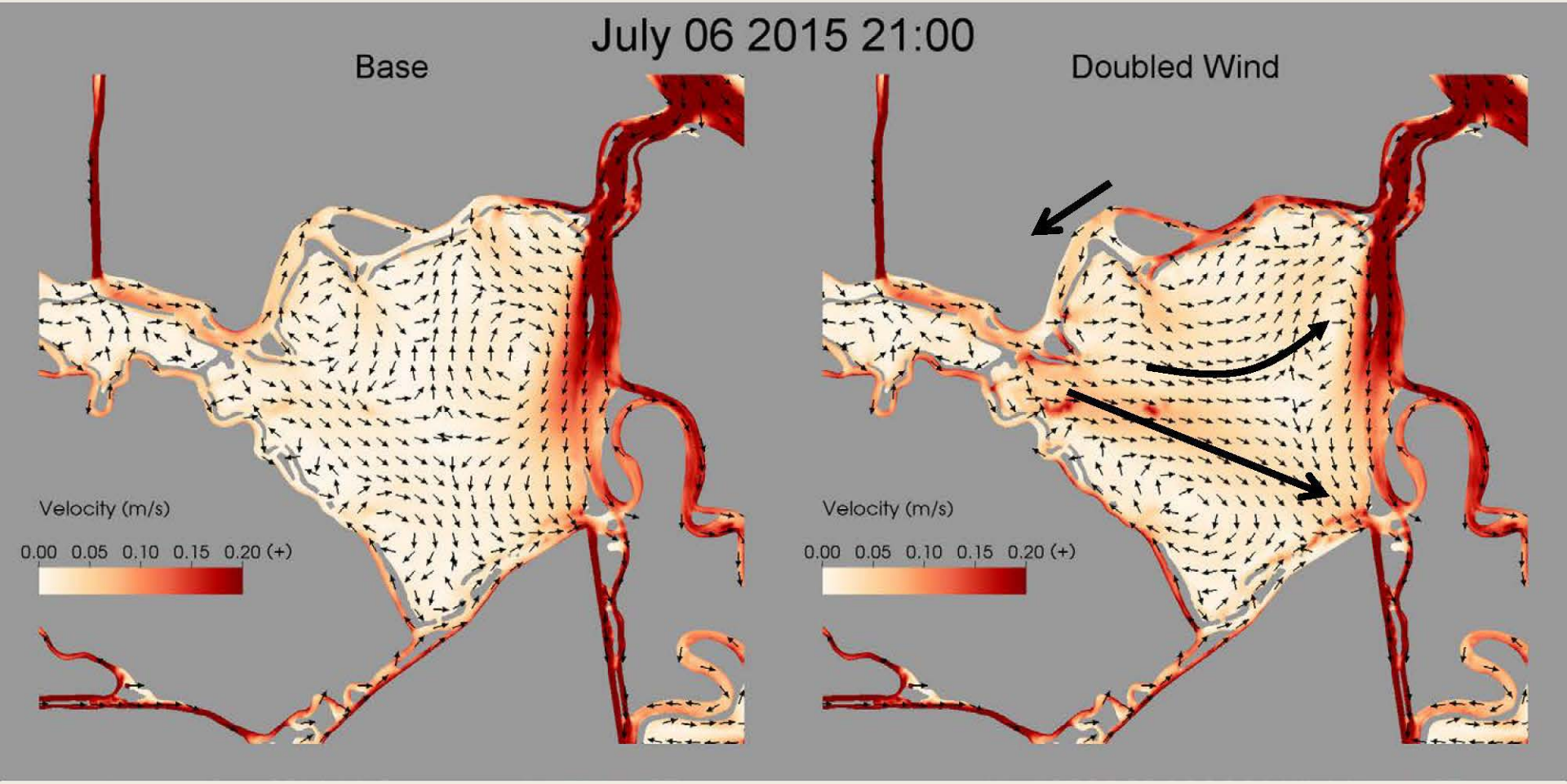
Macro Algae filling Franks Tract



FRK station (DWR)

Provided by Nick Tufillaro


July 06 2015 21:00
Salinity (PSU)
(-) 0.25 0.31 0.38 0.44 0.50 (+)
Velocity (m/s)
0 0.075 0.15 0.225 0.3 (+)


July 06 2015 21:00
Base
Doubled Wind
Velocity (m/s)
0.00 0.05 0.10 0.15 0.20 (+)
Velocity (m/s)
0.00 0.05 0.10 0.15 0.20 (+)

Some Conclusions

- TUCP saves water
- Barrier prevents salinity intrusion
  - Water savings depends on a lot of definitions.
- Need a met station and spatial monitoring

The barrier operated on a clear physical premise. Knowns greater than the myriad unknowns.