Lake physics & modelling

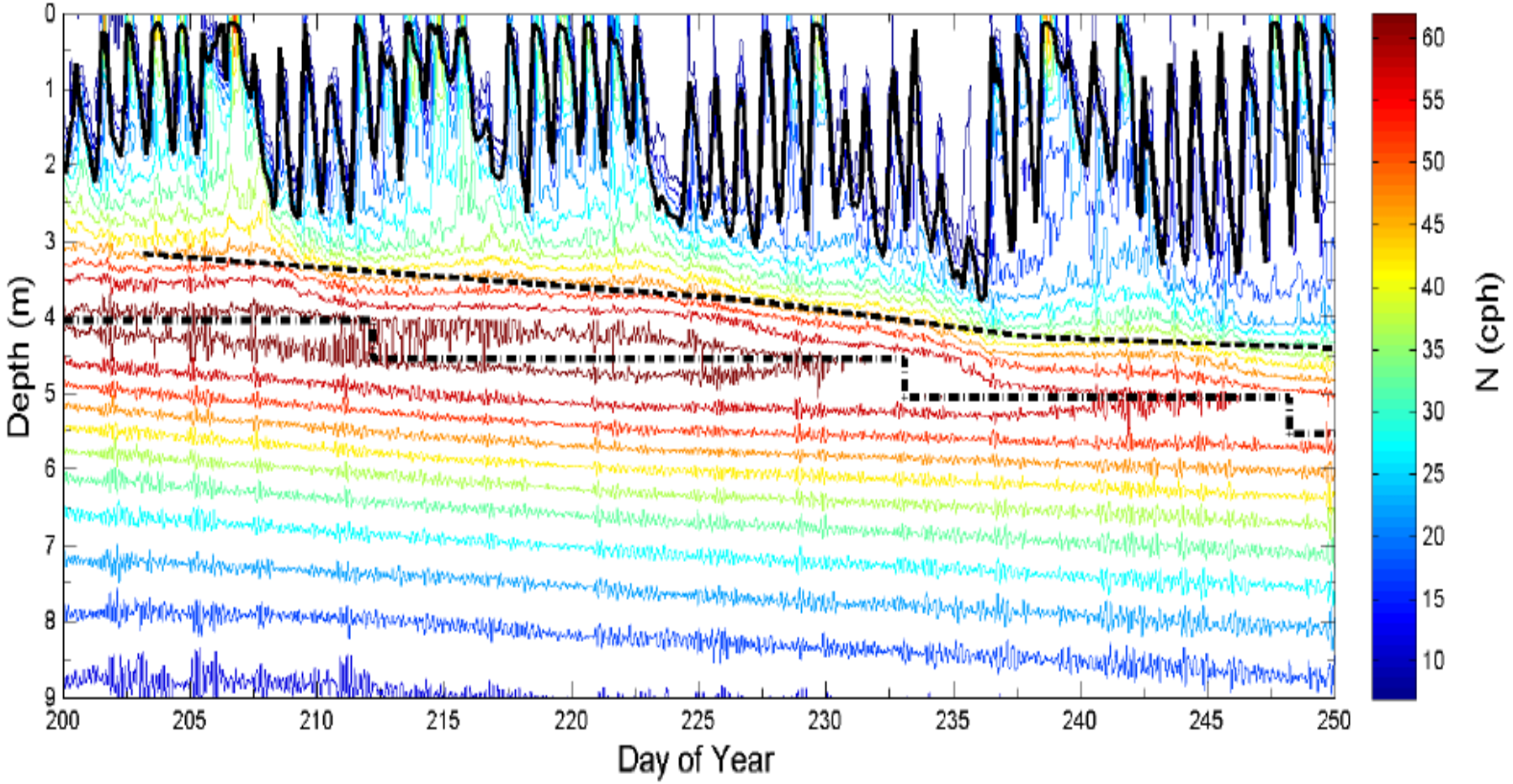
1. Mixing process from small -> large lakes

2. MuSc-FLUX : Lake spatial heterogeneity

3. Ecosystem model structural complexity

1. How do mixing process change from small to large lakes

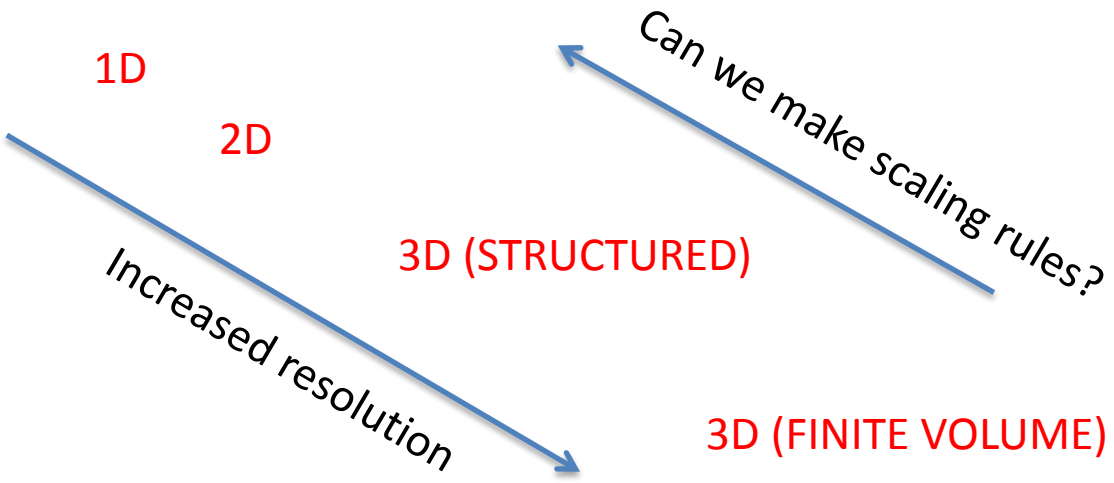
High frequency data from Lawrence Lake, MI



2. Multi- model comparison of spatial heterogeneity in gas fluxes

- Compare 2-3 lakes (small and large)

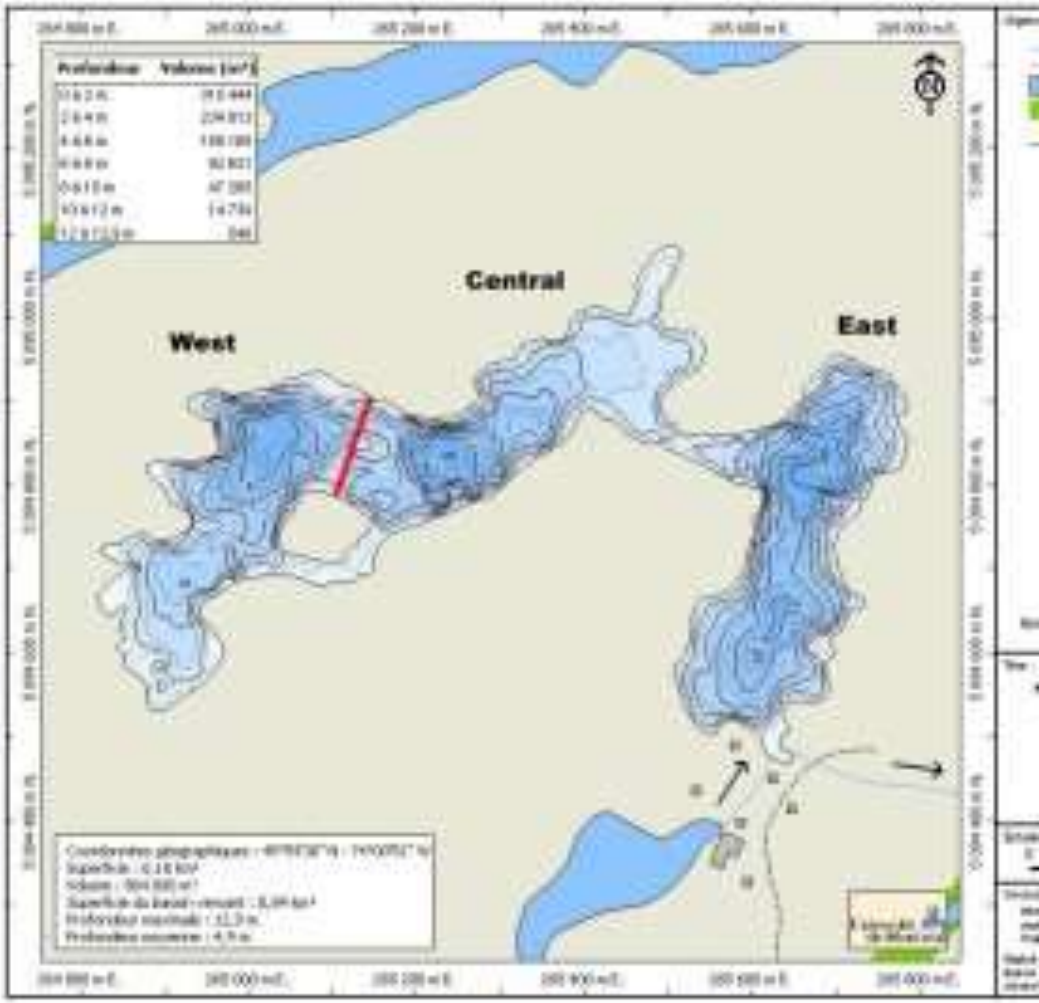
- Compare 5 models



Croche

DATASET

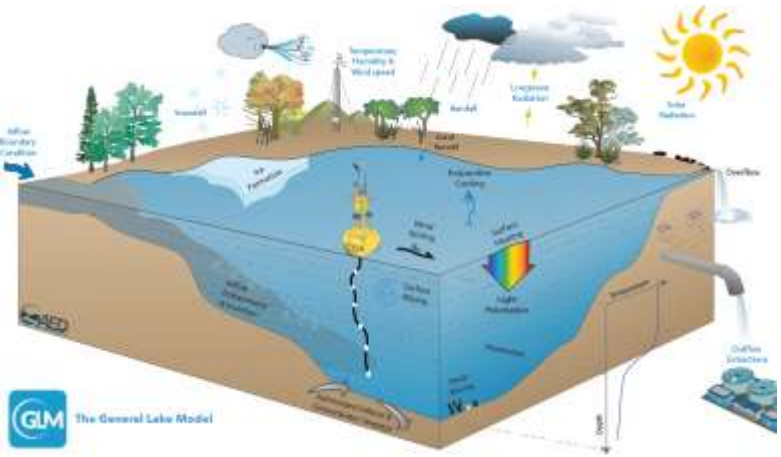
- In situ CO2 time-series
- Met + Buoy
- WQ
- Dry Ice dispersion expt



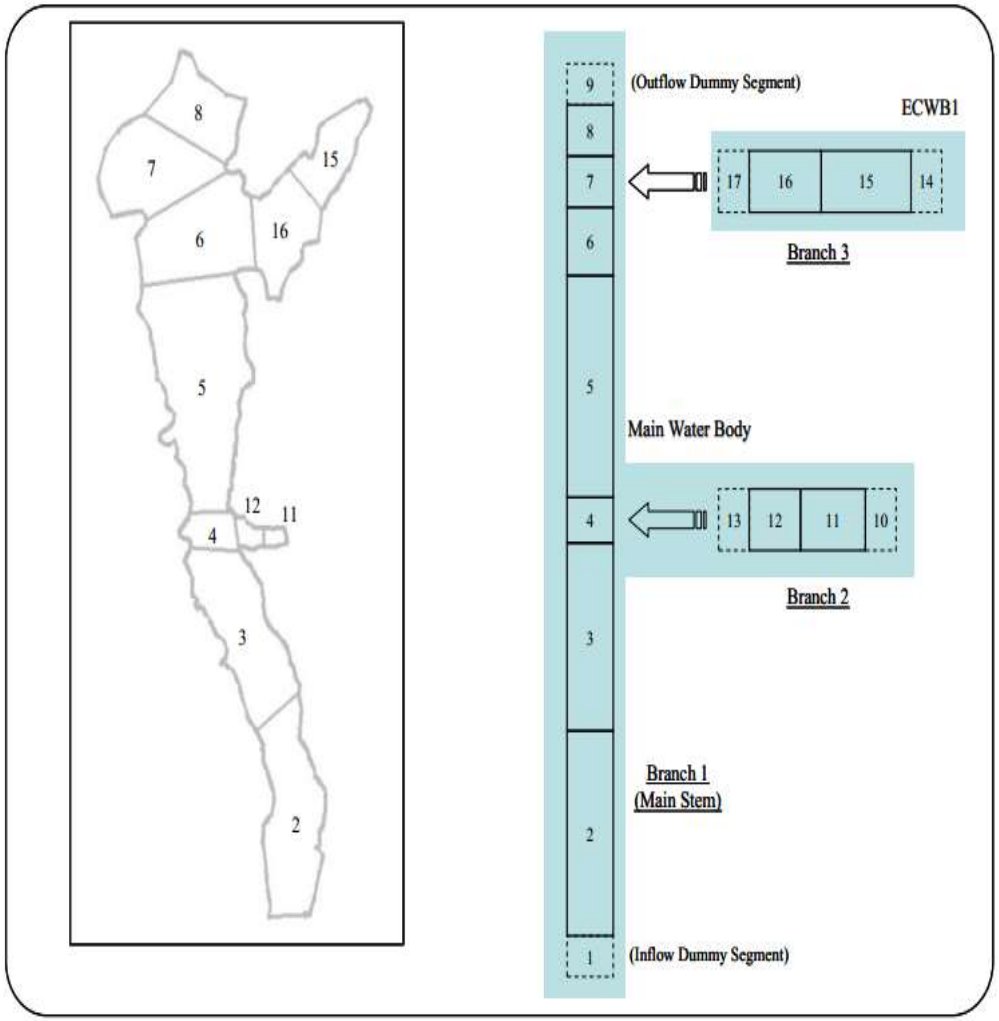
Douglas Lake, Michigan (GLEON site)

Ameriflux site + lake flux towers (Douglas Lake & Great Lakes)

GLM (1D)

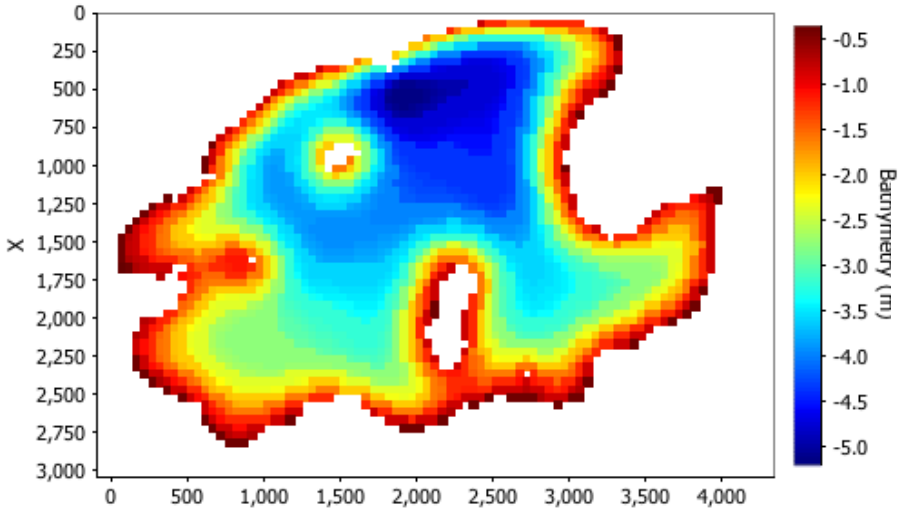


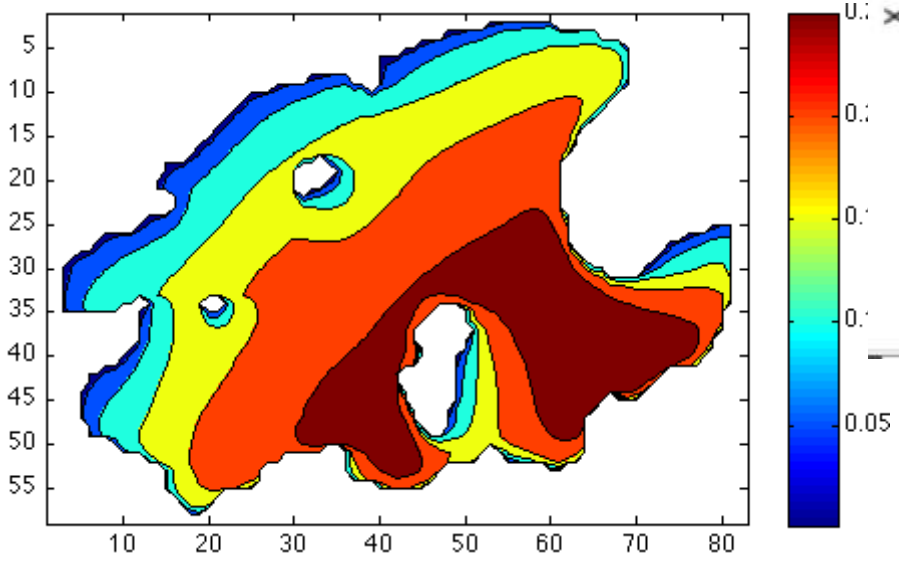
CE-QUAL-W2 (2D)



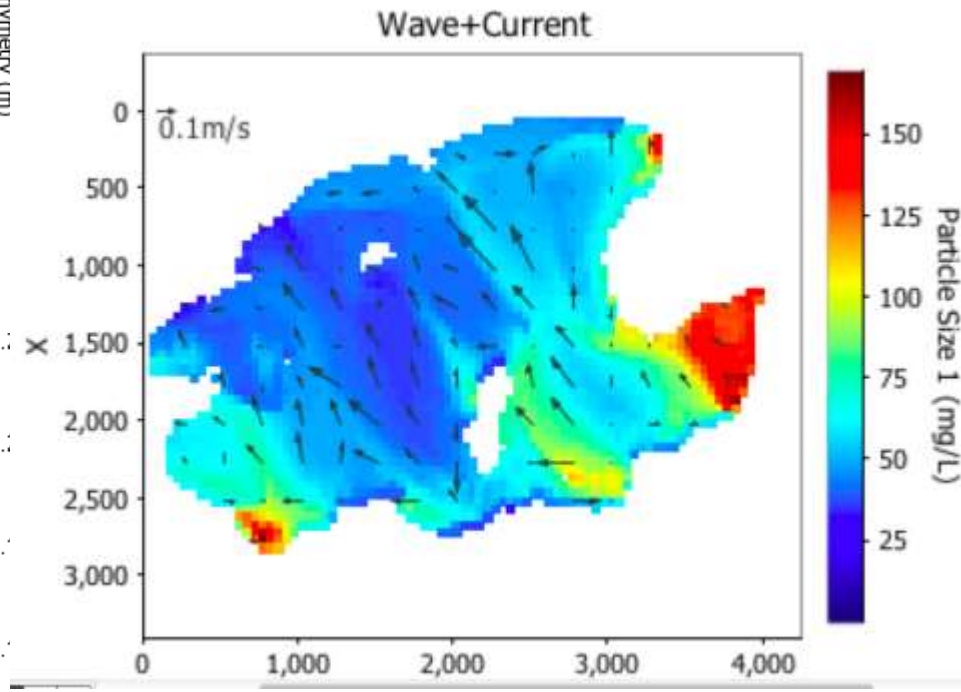
1D – laterally averaged models; 2D averaged in the cross stream direcction

ELCOM-CAEDYM (3D)

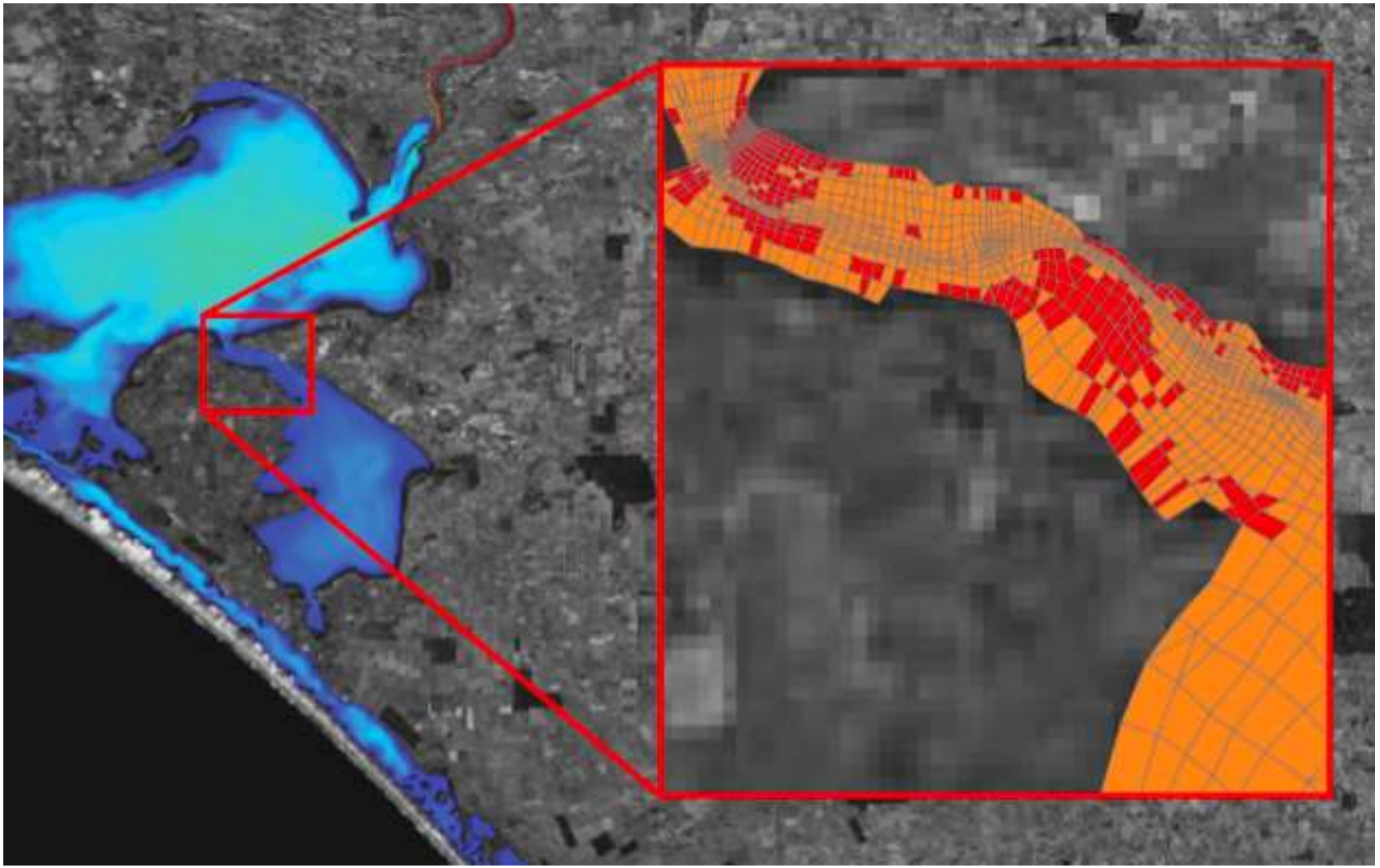




IPH-ECO (3D)



FV-AED (3D – finite volume)



Field validation

!!!! Flux Blitz !!!

- Remote sensing for pattern capture
  - Intensive spatial sampling
    - Hi –res meteorological down-scaling

3. Ecosystem model complexity: how much is enough?

- 6 levels of complexity
  - Configured using FABM-AED modules
- Application to Mendota
- Identify key assessment variables
  - GPP, Anoxia
- Recalibrate each simulation