

CASCade 2

Computational Assessments of Scenarios of Change for the Delta Ecosystem

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Google earth

Can we develop a system of **linked models** to evaluate **ecosystem level impacts** of regional and global scale forcings over this century?

Model(s)

Linkages

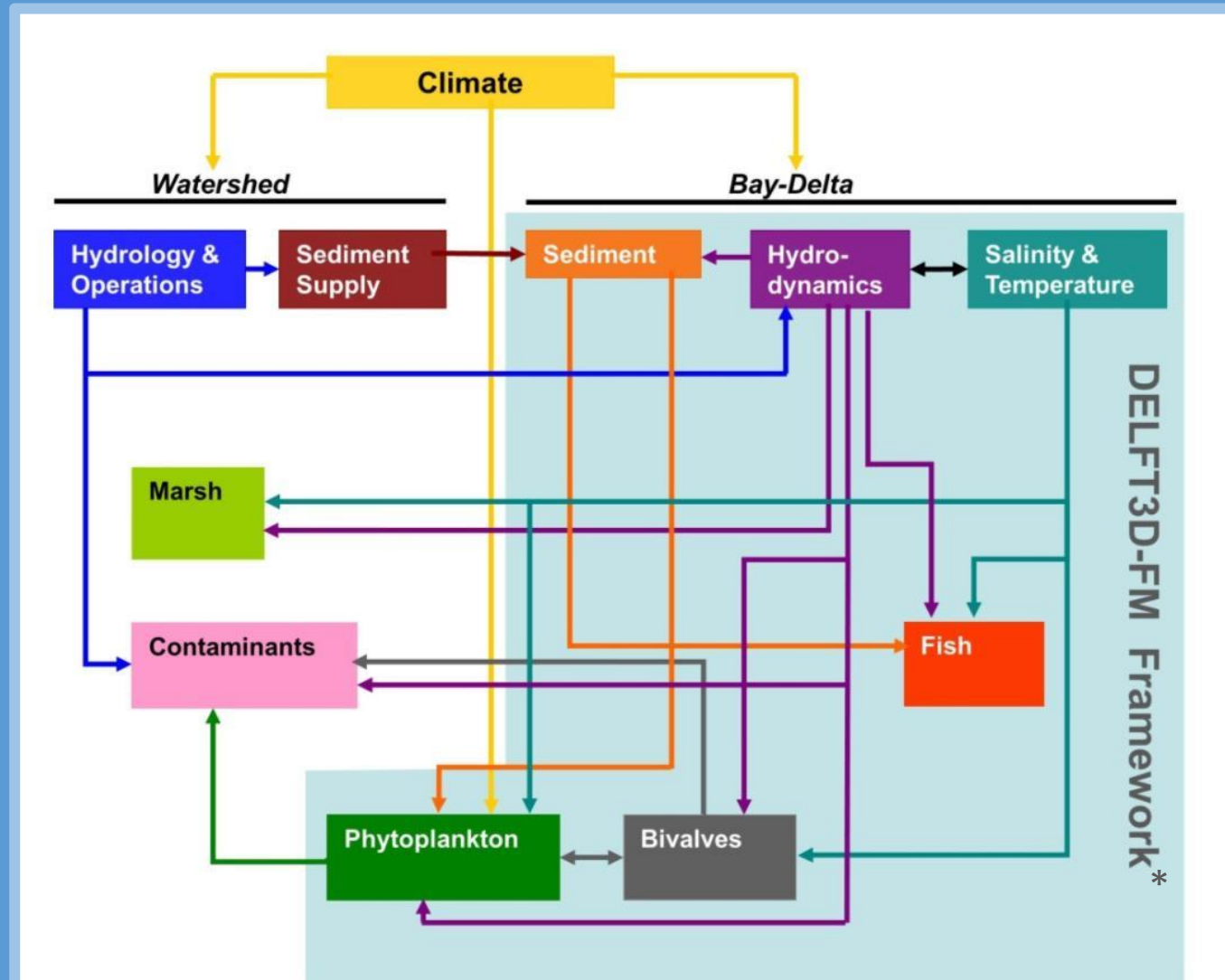
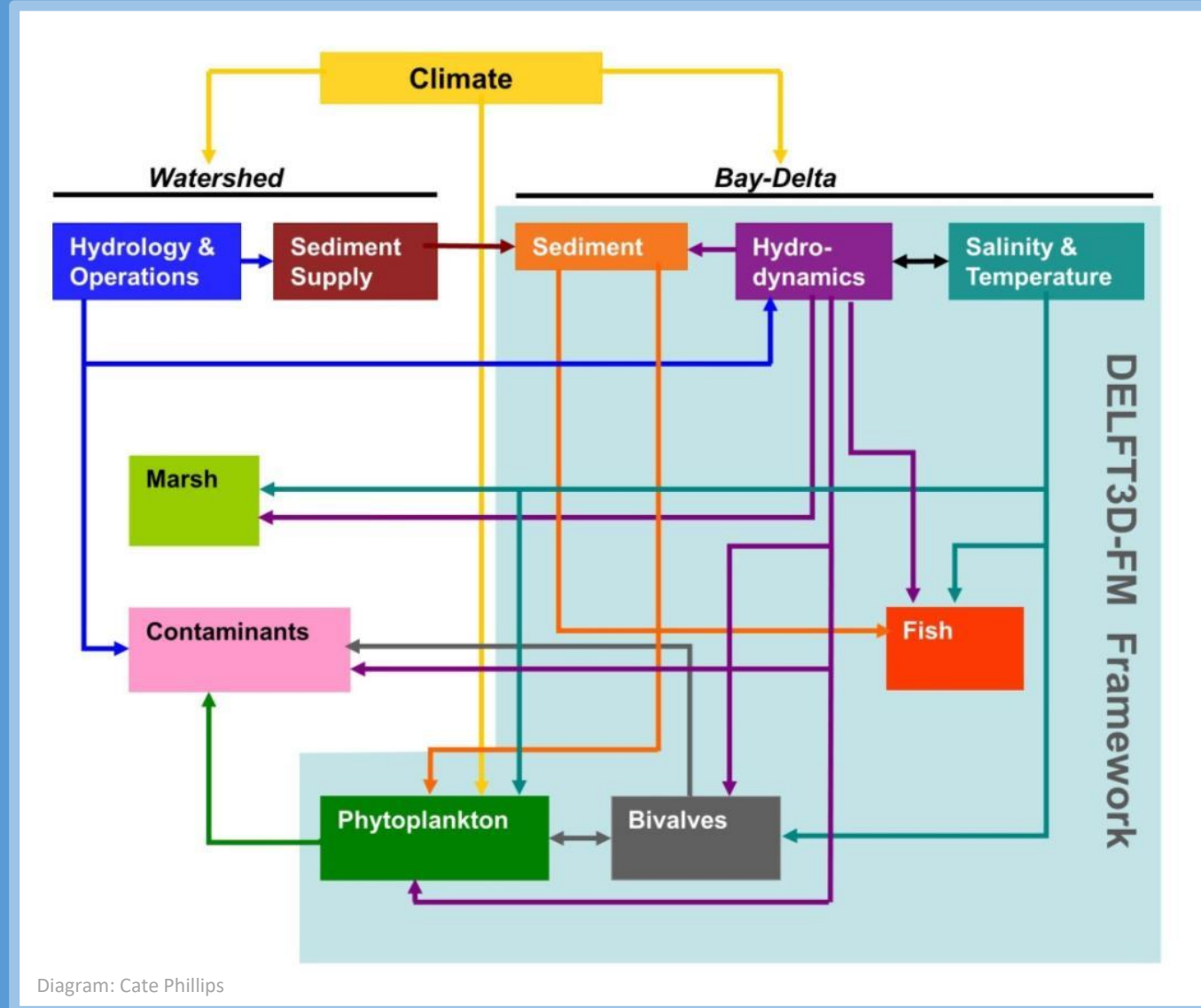


Diagram: Cate Phillips

*Deltares' flexible mesh modeling software

Can we develop a system of **linked models** to evaluate **ecosystem level impacts** of regional and global scale forcings over this century?

- >10 scientific disciplines
- >30 scientists
- 4 USGS Offices
- 4 Universities
- Multiple cooperators
- Primary funders:



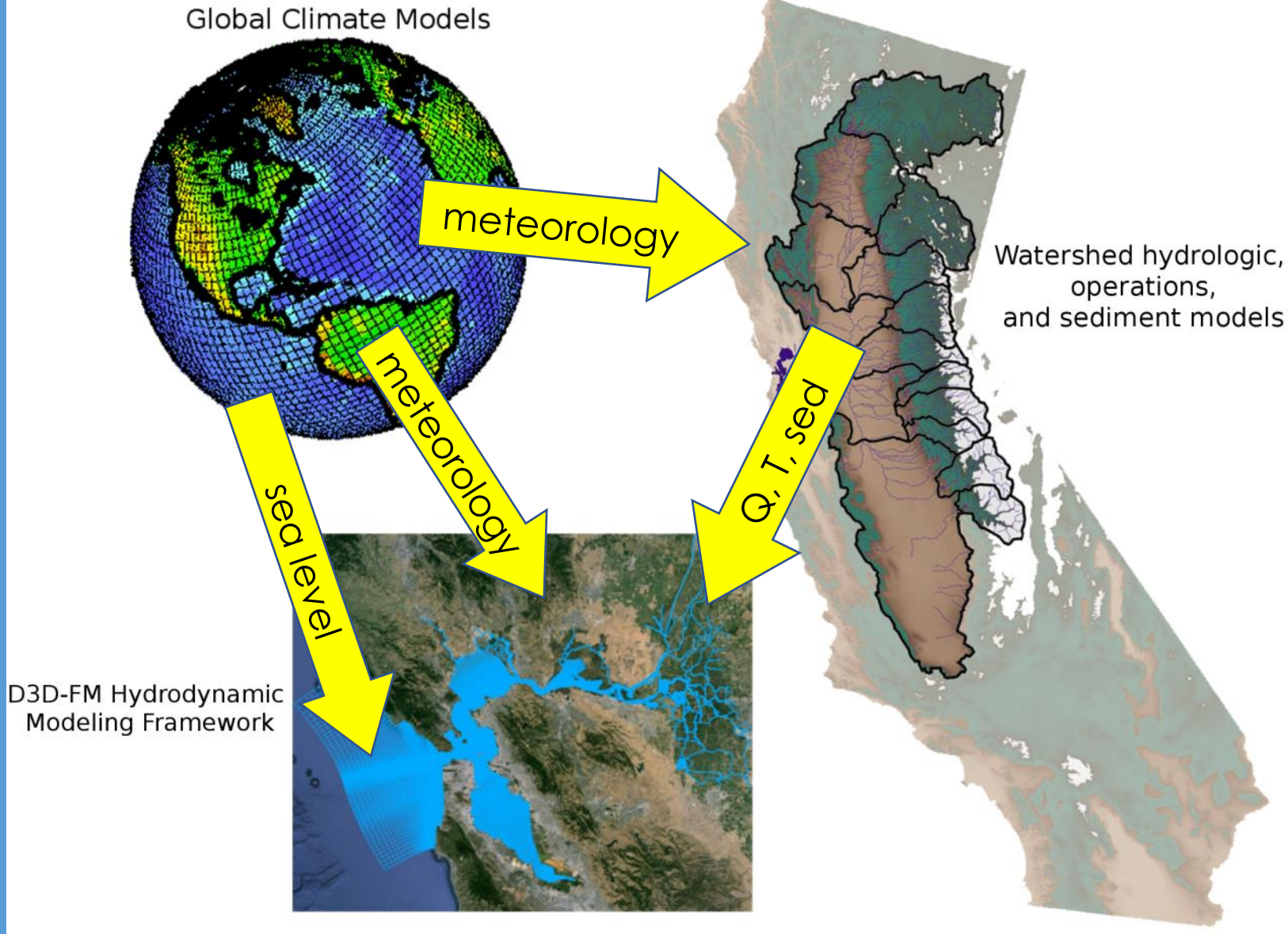
How is the Bay-Delta ecosystem likely to respond to...



Climate Change: e.g., sea level rise, precipitation & air temperature

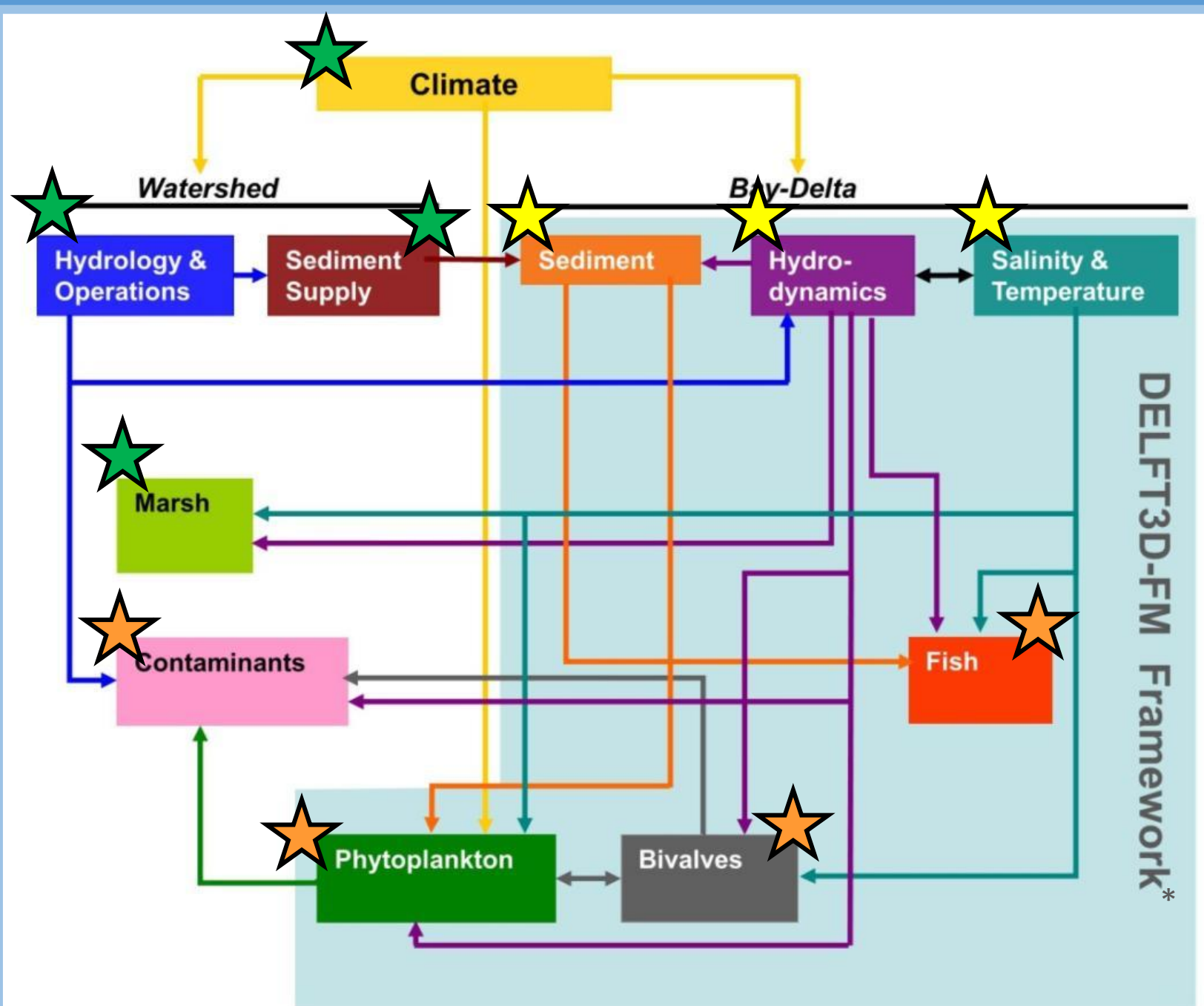
Infrastructure Change: levee failures, alternative conveyance

Consistent, 3-sided climate forcing



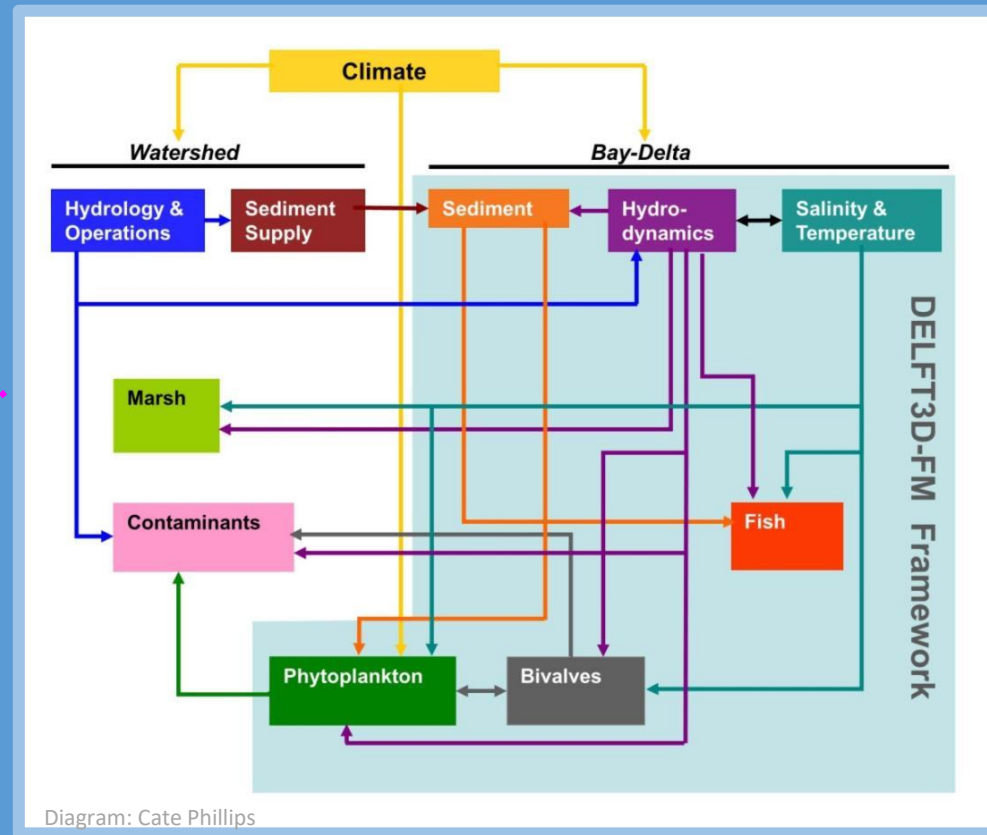
Status of CASCade 2 Products*

-  completed/published
-  runs completed/partially published
-  model linkages developed/proof of concept achieved



*Climate change sims only. Alternative conveyance and flooded island runs set up but not run/finished.

CASCade 2 collaborations & offshoots



Methylmercury modeling in Bay-Delta
(USGS)

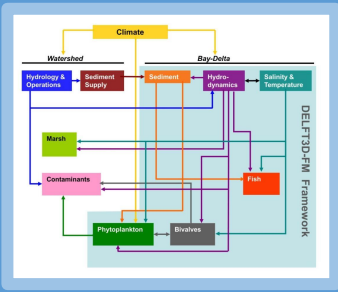
Morphology of looped channel networks
(Univ. of Arkansas)

Effects of climate change & restoration on Delta fishes
(USGS; Huntsman et al. 2024a/b)

Climate change effects on Delta fish phenology
(UC Berkeley)

Biogeochemical Modeling for Nutrient Management Strategy
(SFEI)

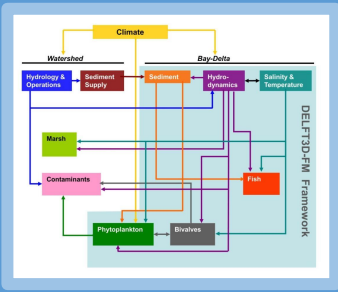
Transport Timescale Computation
(USGS)



How could CASCaDE have benefitted from a collaboratory?

DATA !!!

- QC'ed and Documented
- boundary conditions, validation/calibration
- operations*
- Critical metadata:
 - *vertical location of water quality sensors*
 - *instrument calibration info (e.g., for fluorometers)*
 - *data limitations (e.g., potential for drift)*
 - *corrections performed or needed*
 - *time zones*
 - *uncertainty*
 - *annotated/checked by experts*

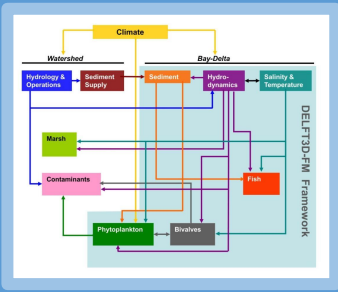


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QC, legwork,
documentation by
Collaboratory
Staff

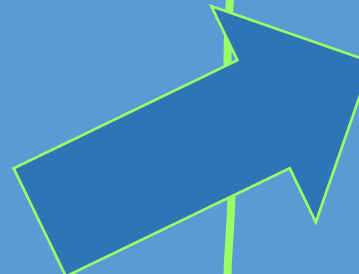


What could CASCaDE contribute to a collaboratory?

DATA !!!

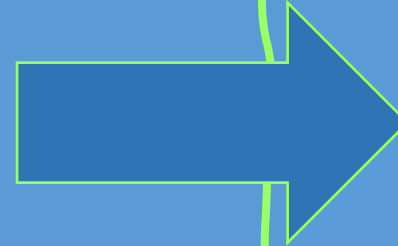
- CASCaDE Modeling Page at Collaboratory website (?)
- Once published, would include links to:
 - **Model set-ups**
 - boundary conditions, initial conditions, grids
 - e.g., climate scenario model inputs for simulating hydro, sal, temp, sed
 - **Model outputs**
 - flows, surface elevations, diffusivities
 - salinity, temperature, sediment fields & timeseries
 - Downloads/metadata at USGS and/or Deltares websites
 - Relevant papers/reports

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So other modelers can use/modify for running their own sims (even w/different software)

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For:
 1- driving new water quality or ecological sims
 2- ecological, morphological, hydrodynamic analyses sans new sims

Thank you!

