

Opportunities for Collaboration & Data Sharing

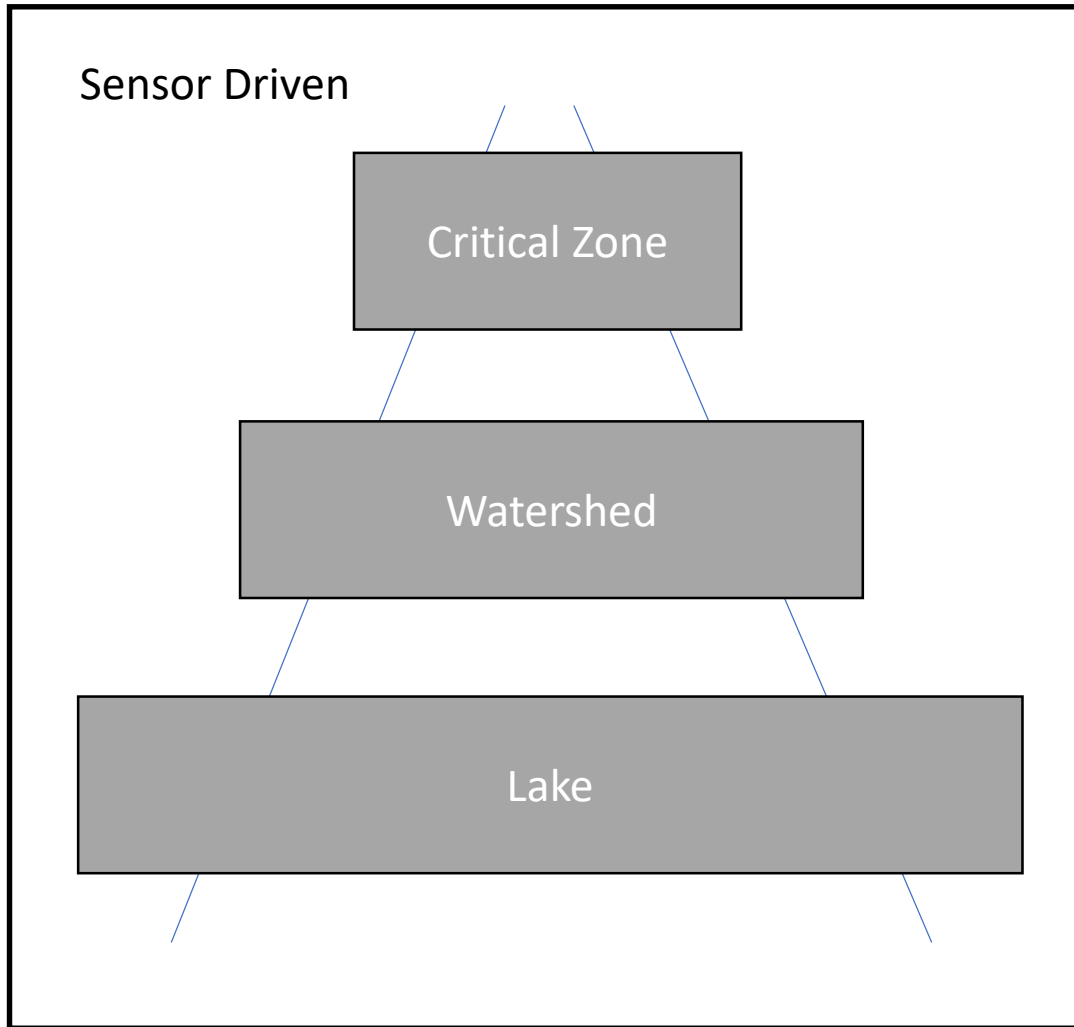
Elizabeth M. B. Doran, PhD

Postdoctoral Associate, VT EPSCoR BREE

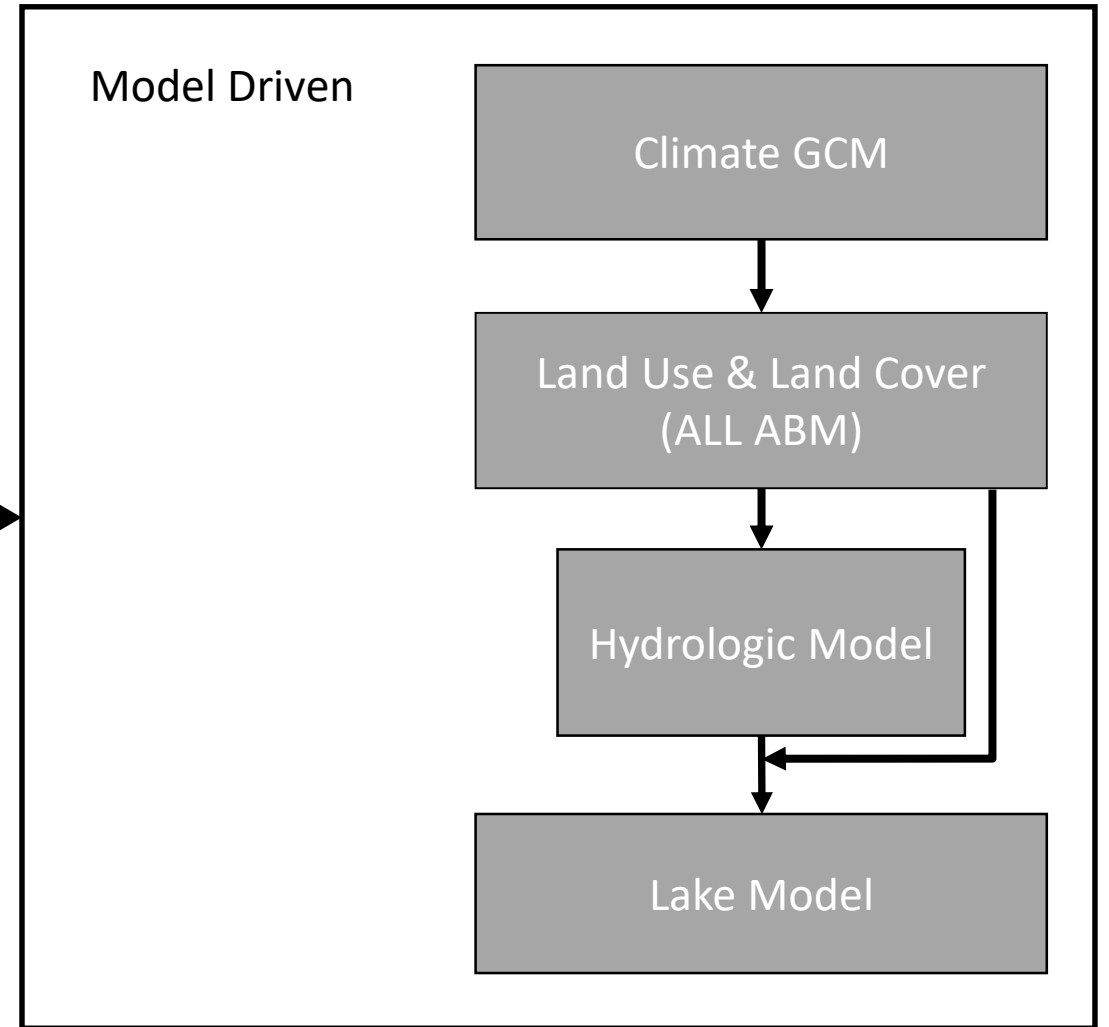
Postdoctoral Fellow, Gund Institute

PTAC/IJC Meeting | May 8, 2019

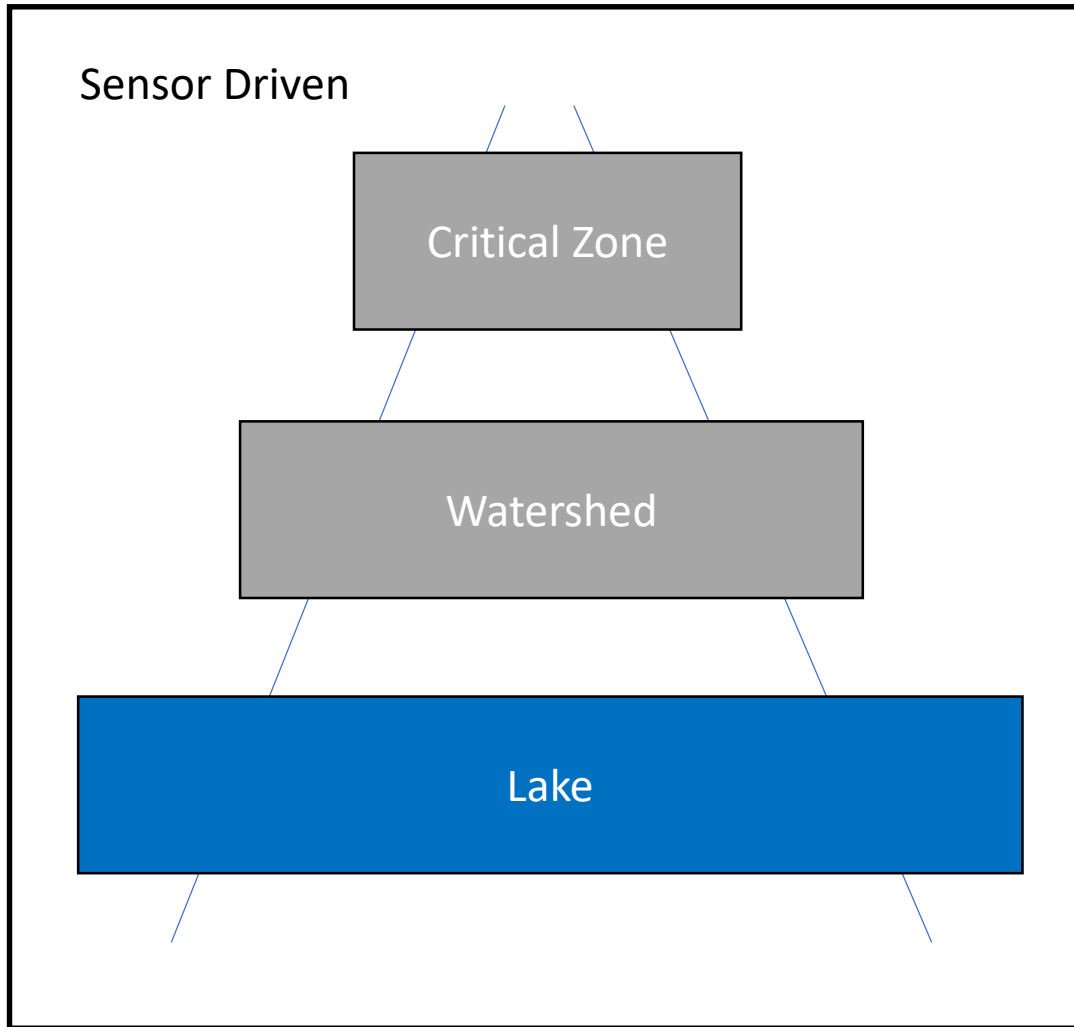
The BREE Ecology Team



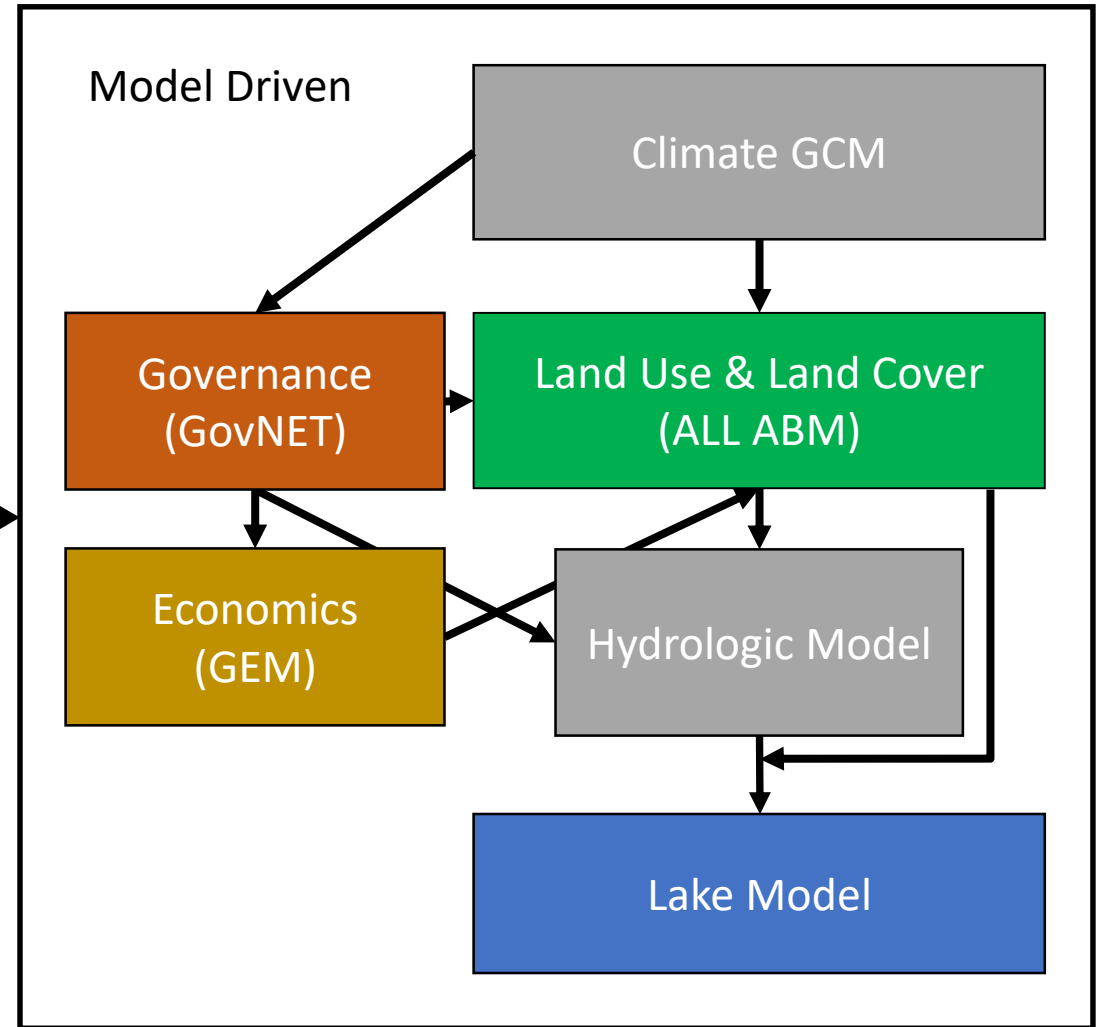
The BREE Integrated Assessment Model



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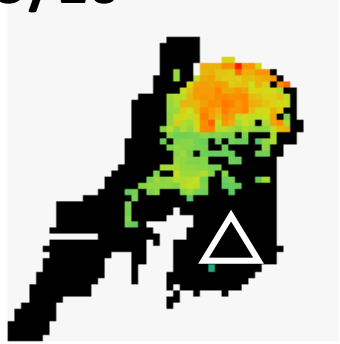


HABs are an increasing problem...



2017 bloom was late and persisted into October in MB but shut down late September in St. AB

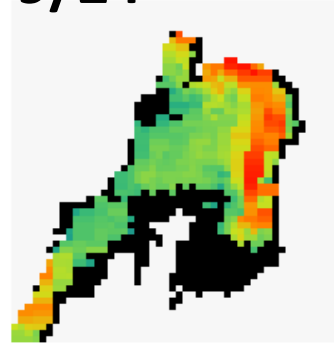
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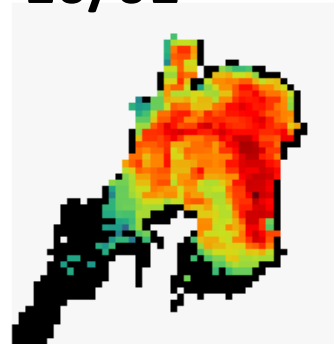
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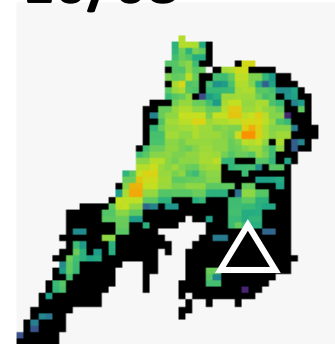
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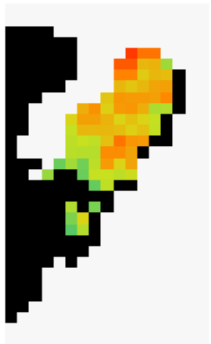
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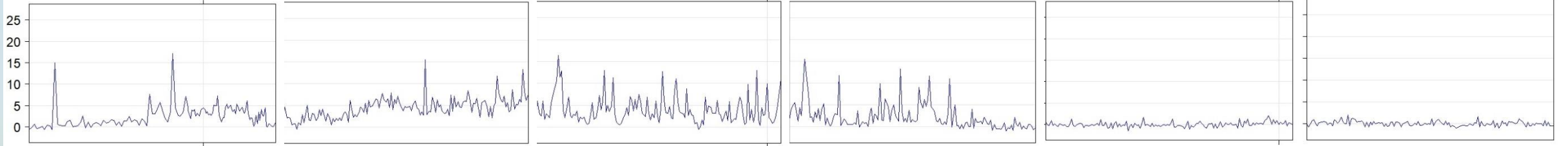


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Cyanobacteria levels from the MB buoy



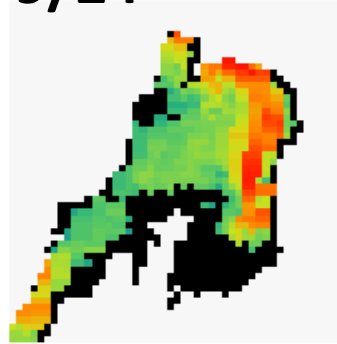
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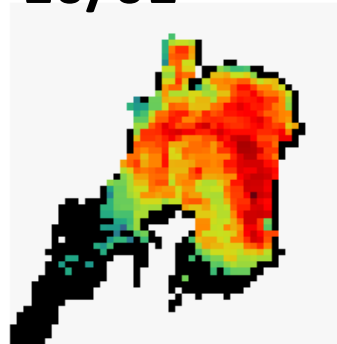
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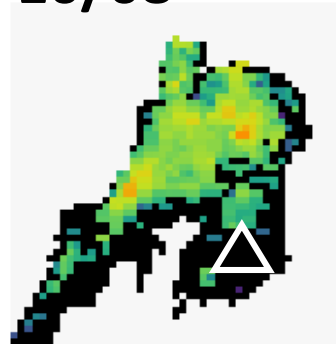
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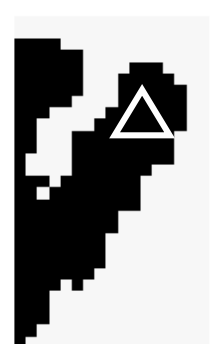
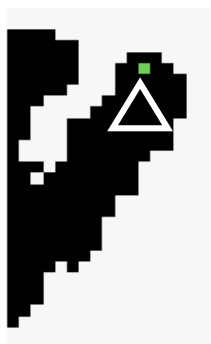
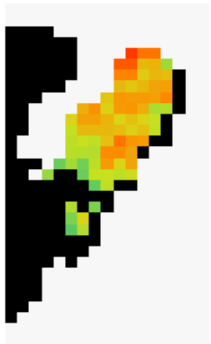
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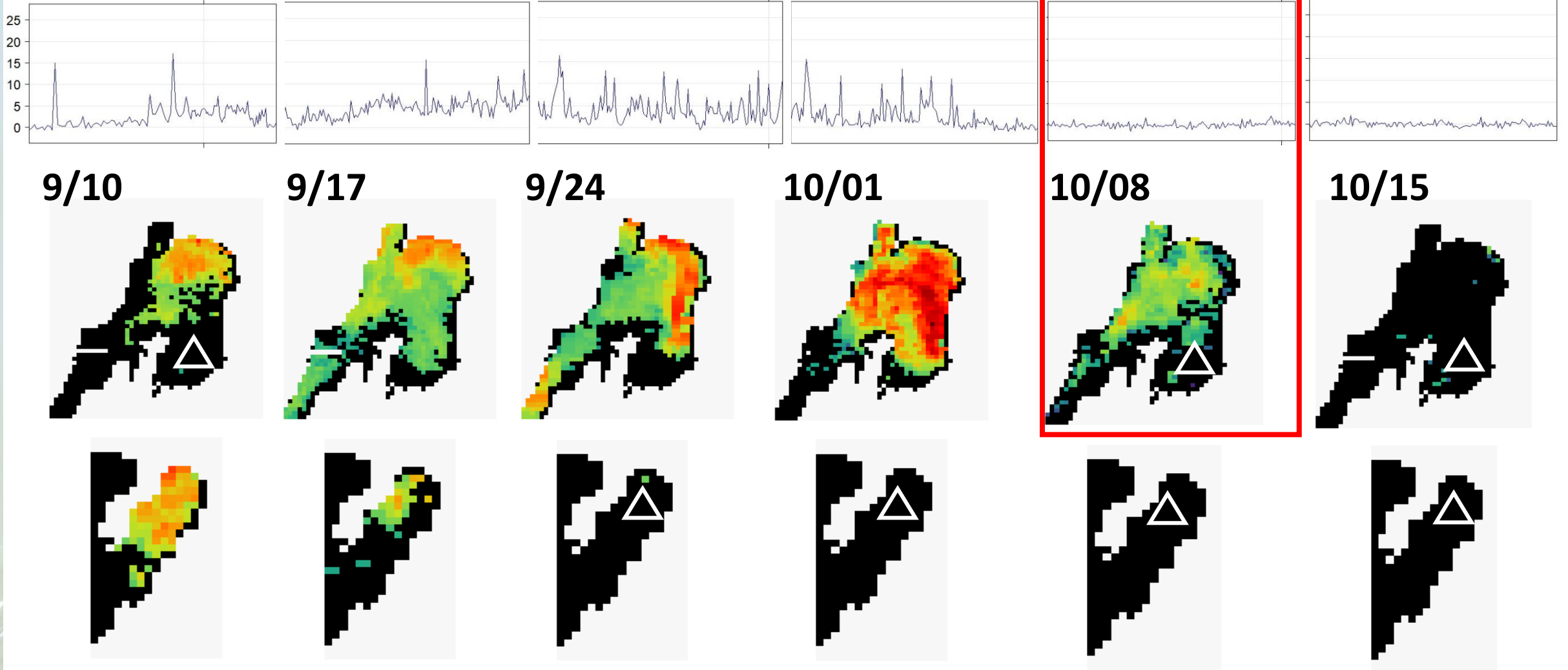


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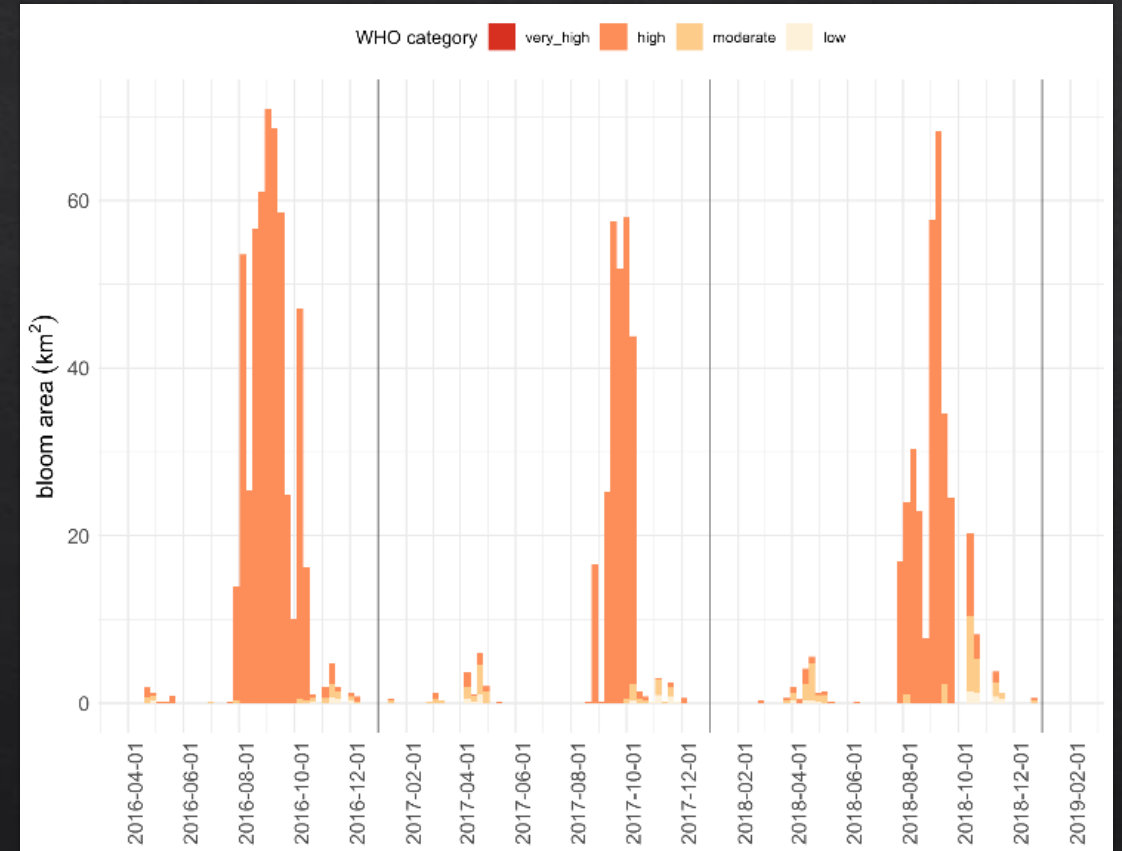
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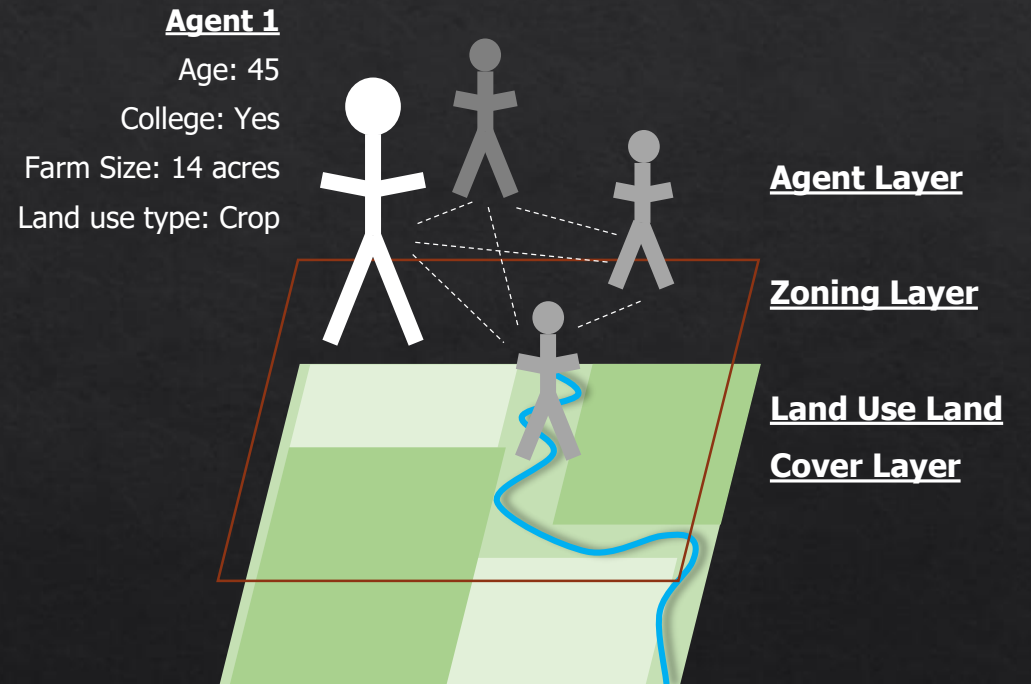
Biogeophysical System

- ◇ Lake
 - ◇ In bay water quality monitoring data and review of existing studies
- ◇ Watershed hydrology
- ◇ Climate
 - ◇ Station data
 - ◇ Gridded datasets for historical period analysis and future period calibration
 - ◇ GCM simulations of future climate
 - ◇ Lake buoys and met stations



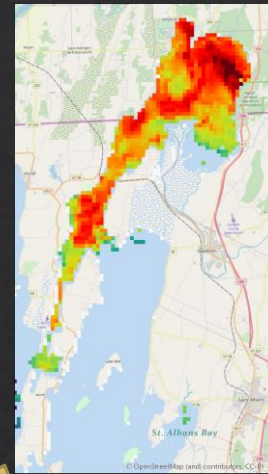
Land and Watershed

- ◆ Land owner nutrient best management practice adoption and motivation to adopt
 - ◆ Farmer, forester, residential, business, municipality
- ◆ Zoning regulations and maps
- ◆ Land Cover digital maps
 - ◆ 30m resolution, 16+ landuse classifications
 - ◆ In US: National Land Cover Database





TP loads/targets



HABs

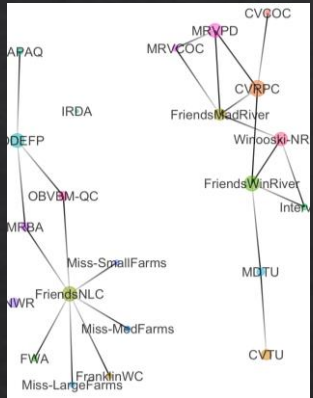
Problem(s) & objective(s)

Actors



Governance actors, capacity (\$), policy tools, and network structure(s)

Networks

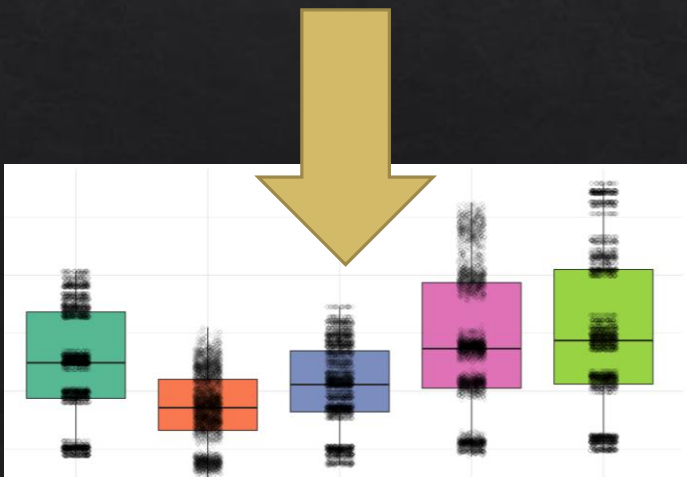


Governance

Governance ABM (GovNET)

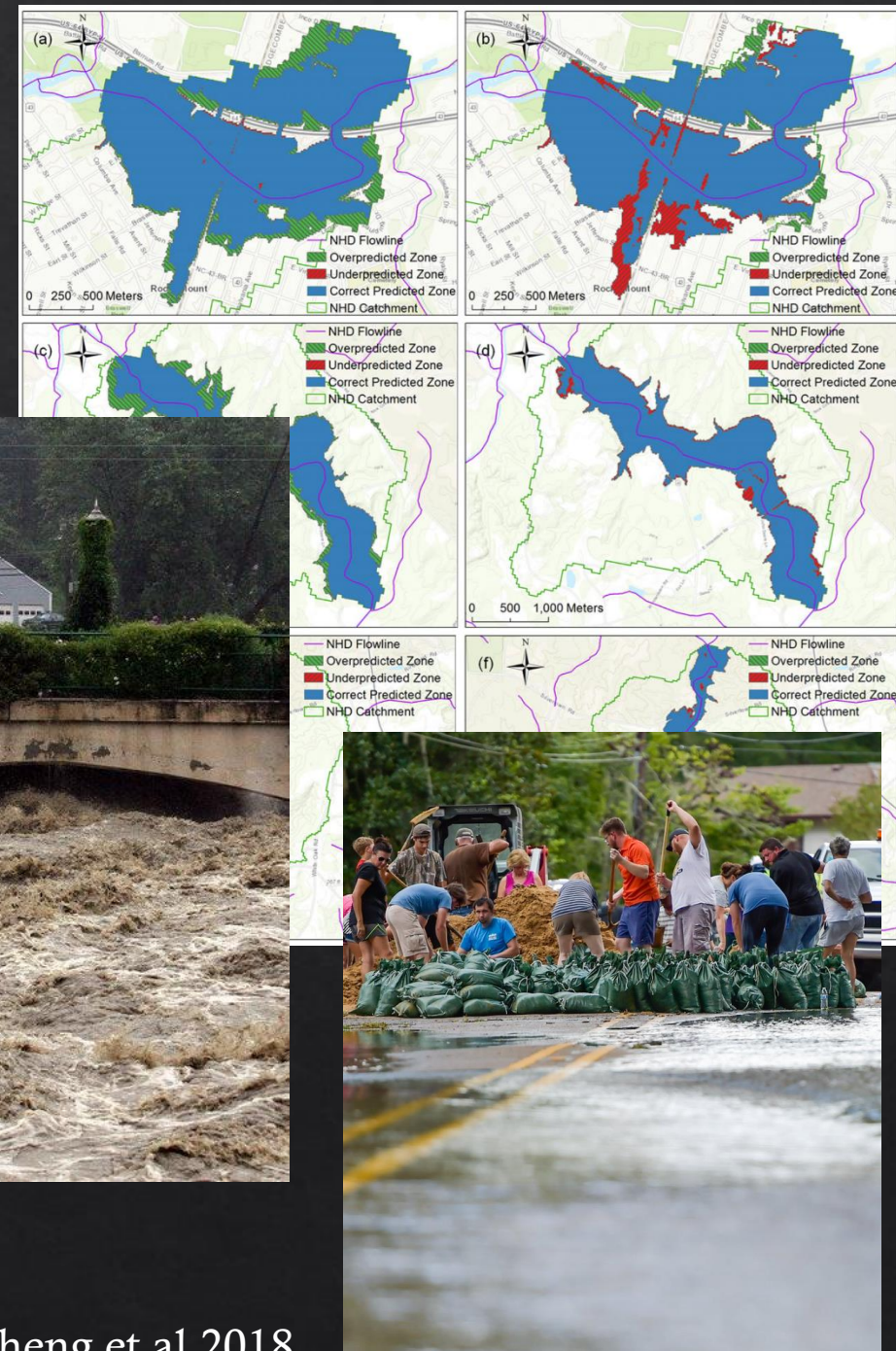
Multi-dimensional policy evaluation, prioritization, & decision-making

- ◇ CA/QC water quality regulations
- ◇ Programs, budgets, incentive spending, education, technical assistance
- ◇ Climate change/environmental quality beliefs
- ◇ TP & N estimates
- ◇ Agricultural productivity and profitability



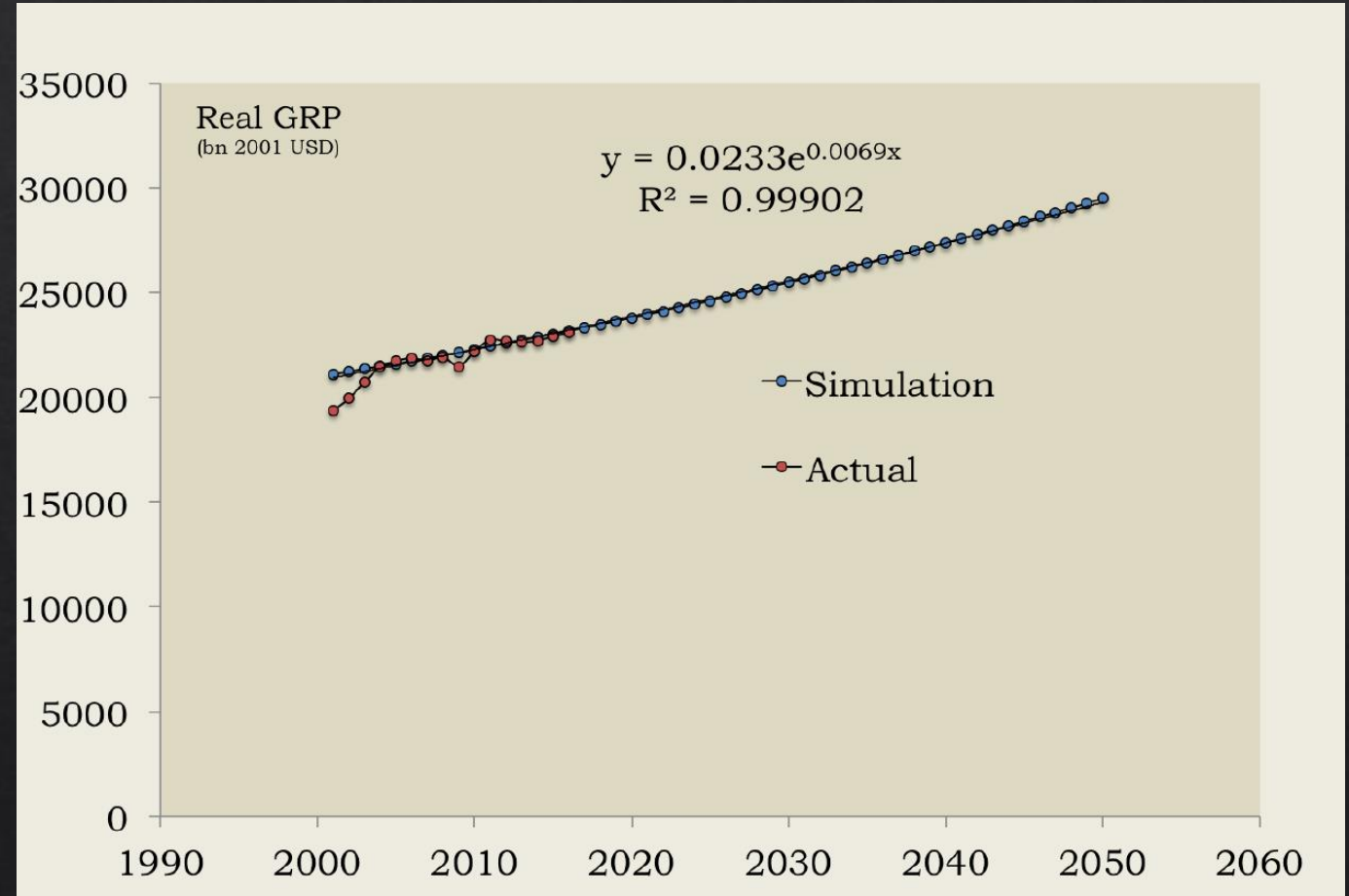
Microeconomic

- ◆ **Historical inundation maps:** These data would be used to validate outputs from a simple GIS-based floodplain delineation model.
- ◆ **Property transfer data:** These data would be used to estimate impacts of changes in water quality on housing prices.
- ◆ **Meals and rooms tax statistics:** We expect that improved water quality will benefit the tourism industry in both Vermont and Quebec. Using meals and rooms tax data as a proxy for tourism expenditures, we can predict how water quality changes will affect the local tourism and recreation sectors of the economy.

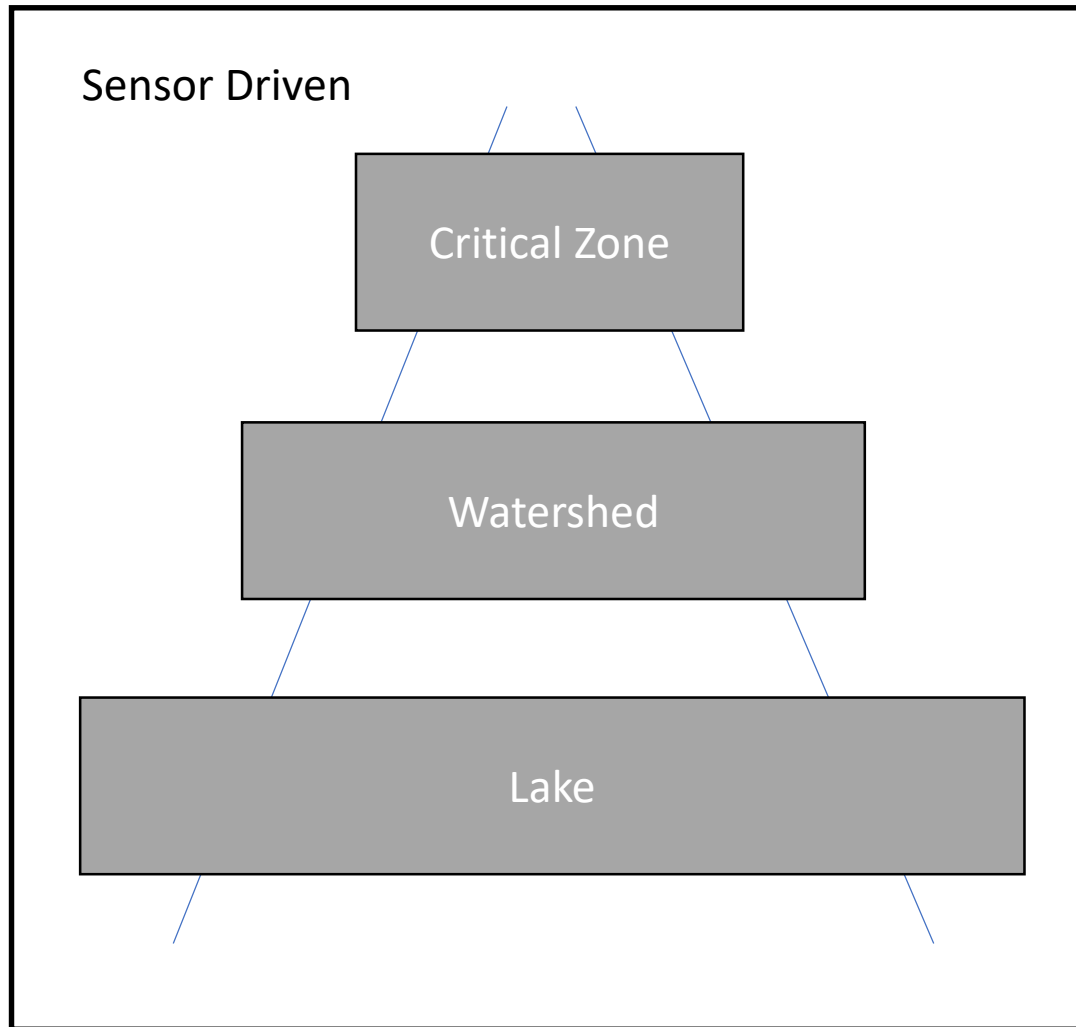


Macroeconomic

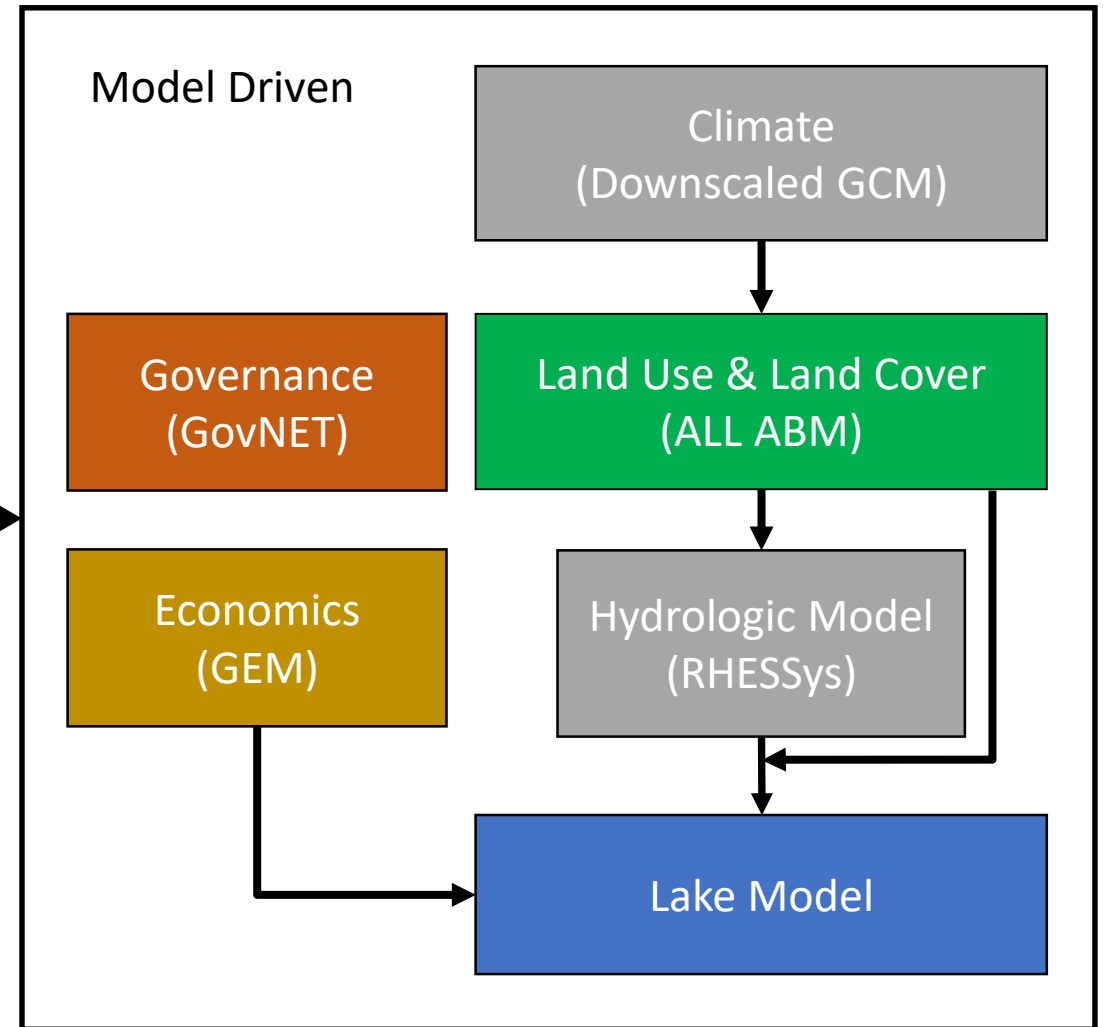
- ◆ Regional input-output (I/O) or social accounting matrix for the LCB in Canada



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Questions?