



GCAM 5.4 Overview

May 31, 2022



PNNL is operated by Battelle for the U.S. Department of Energy

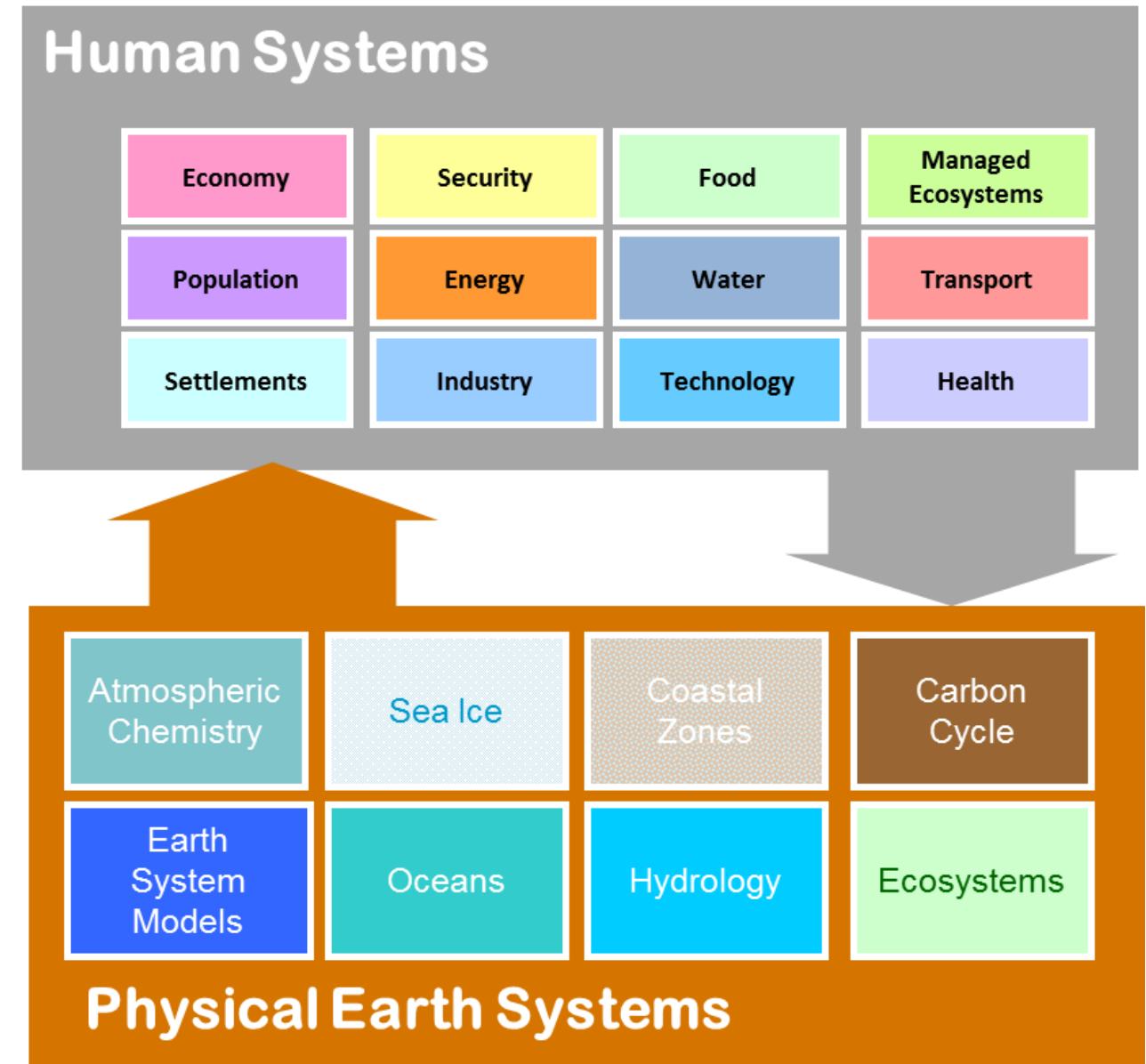


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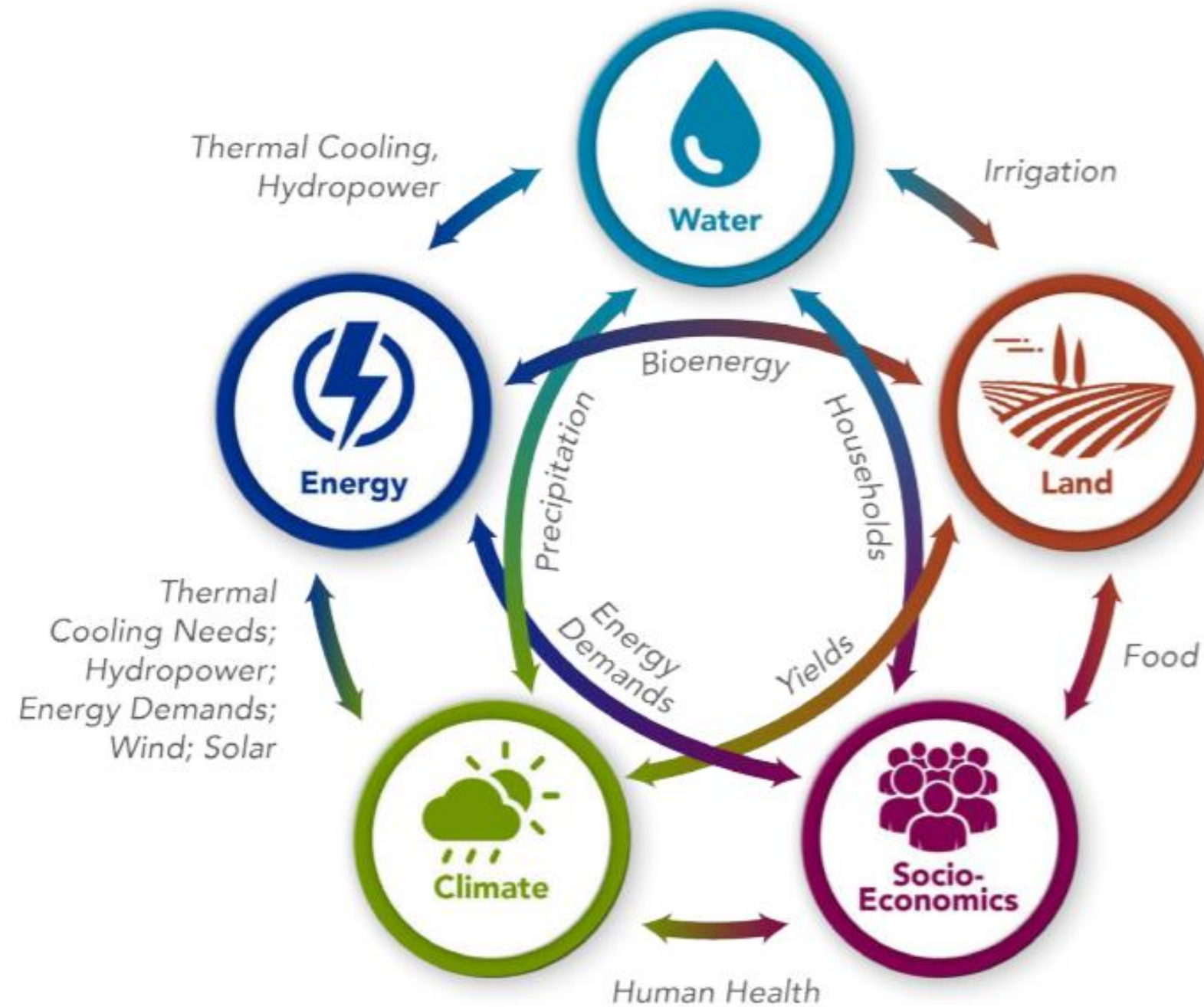
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Introduction – Integrated Assessment Models (IAMs)

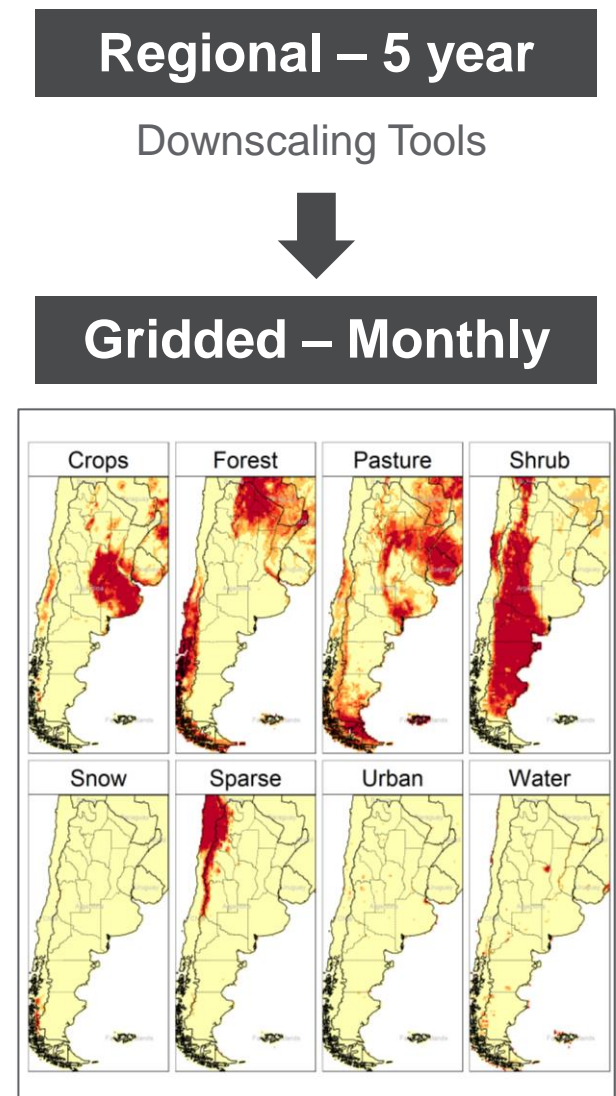
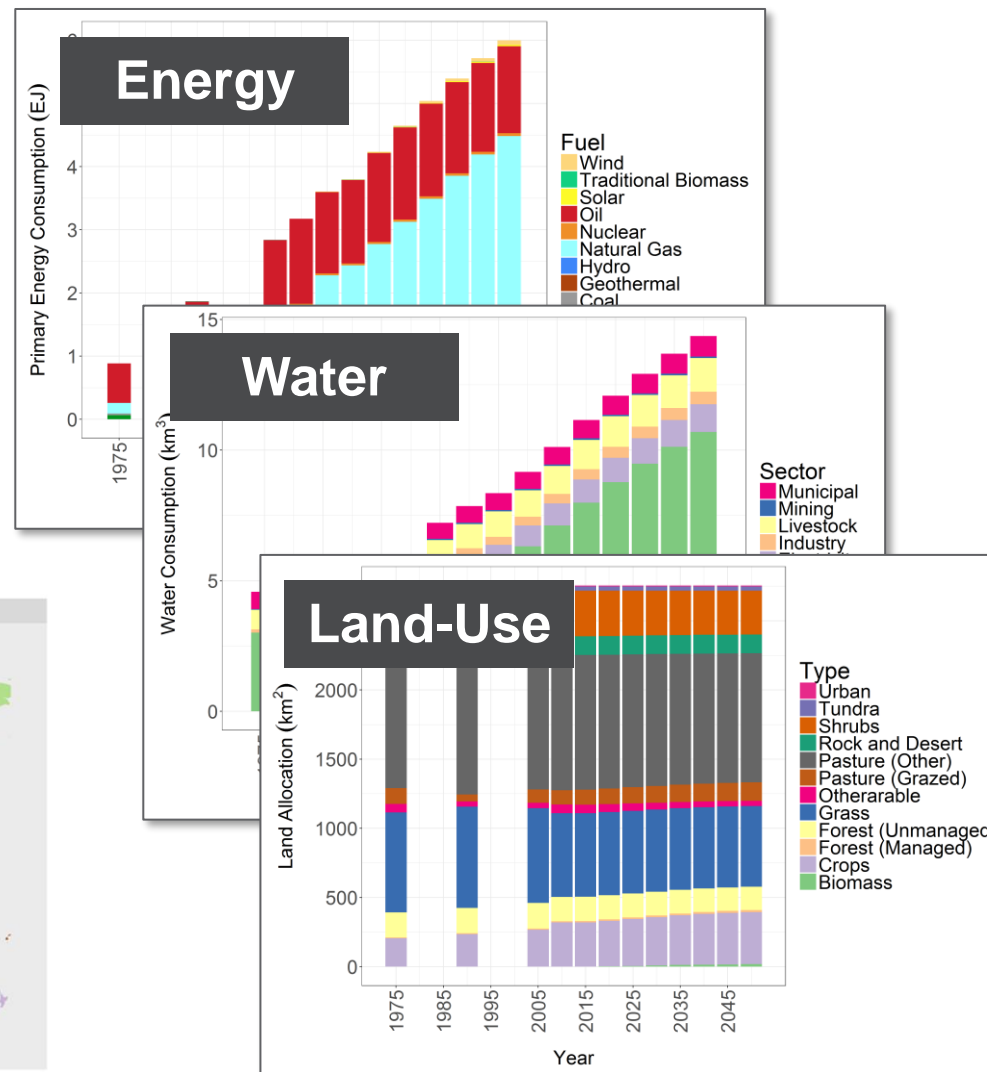
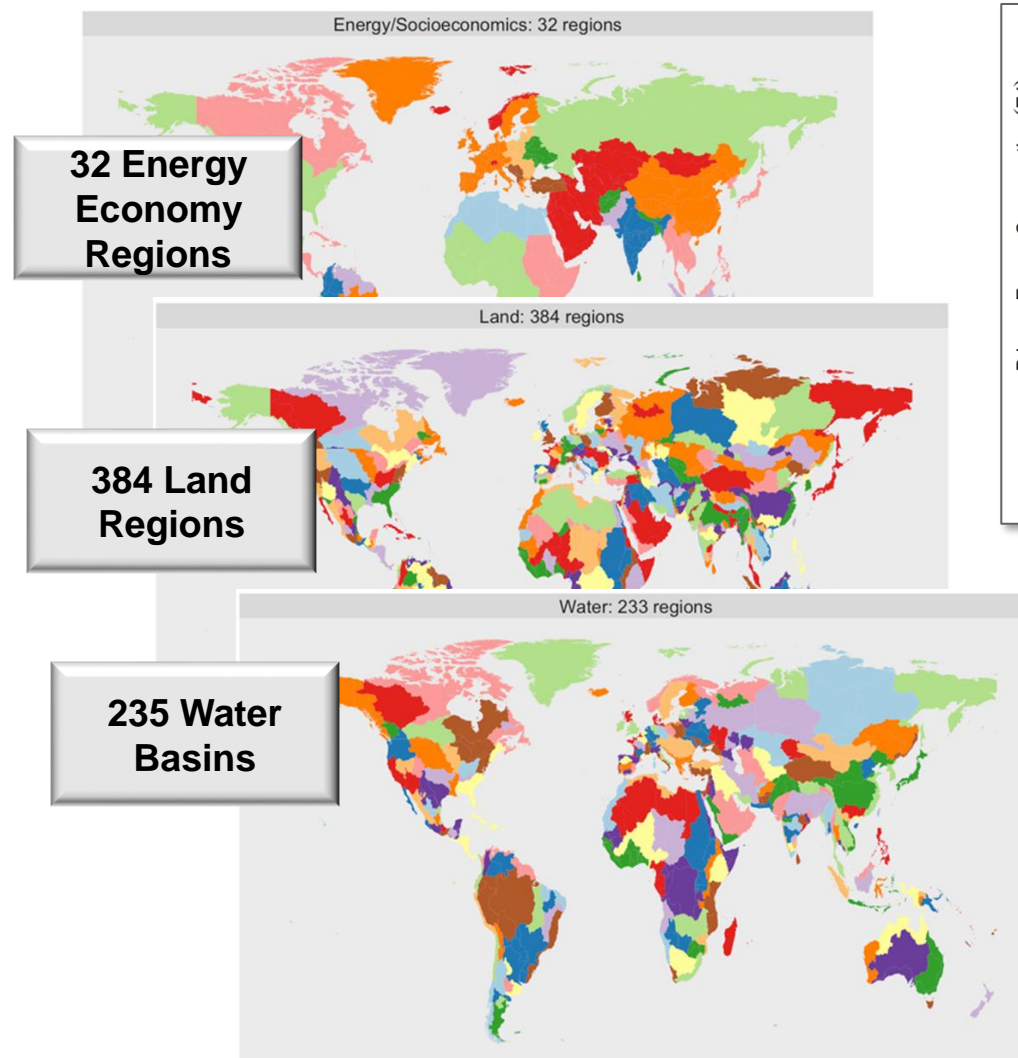
- Provide nexus insights otherwise unavailable from disciplinary research alone.
- Capture complex non-linear system Interactions
- Support national, international, regional, and private-sector decisions.
- Examples: AIM, GCAM, IGSM, IMAGE, MESSAGE, REMIND



Overview of GCAM

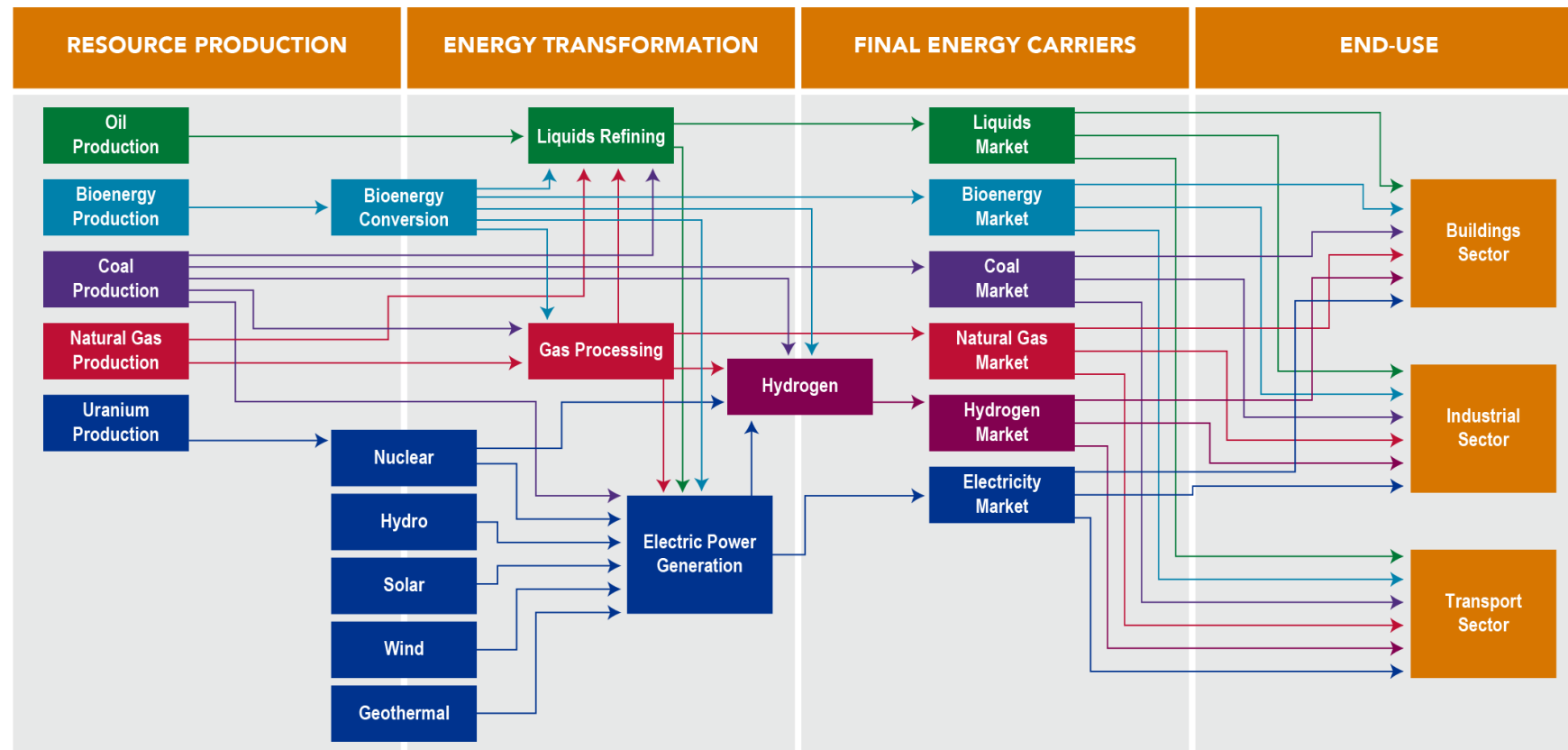


GCAM is a global long-term integrated assessment model
GCAM links **Economic**, **Energy**, **Land-use**, **Water**, and **Climate** systems

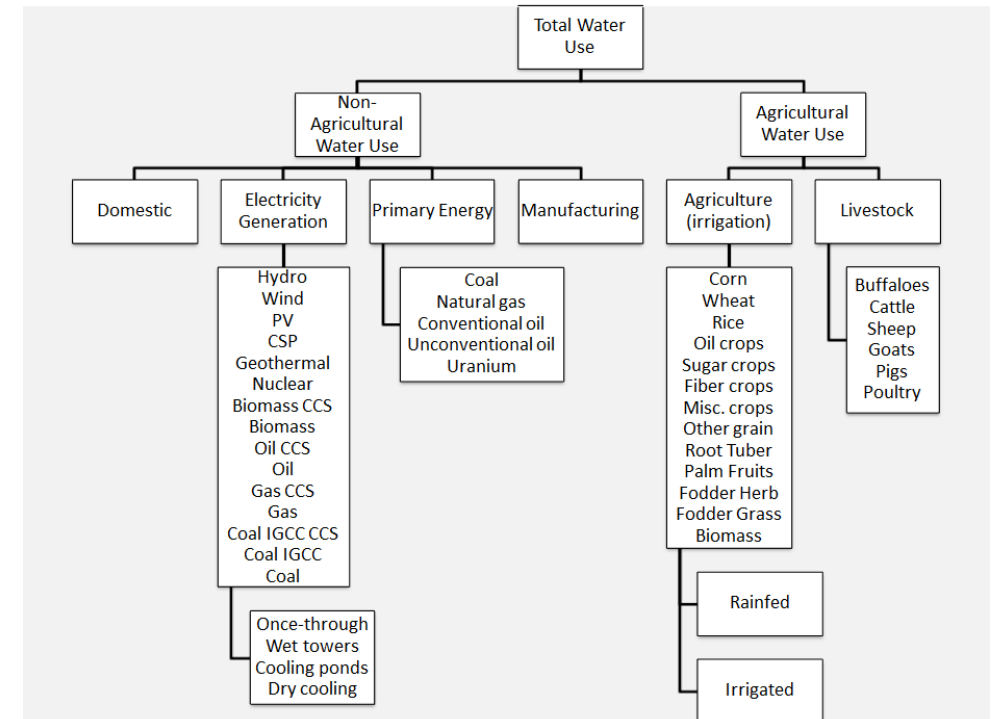


GCAM - Systems

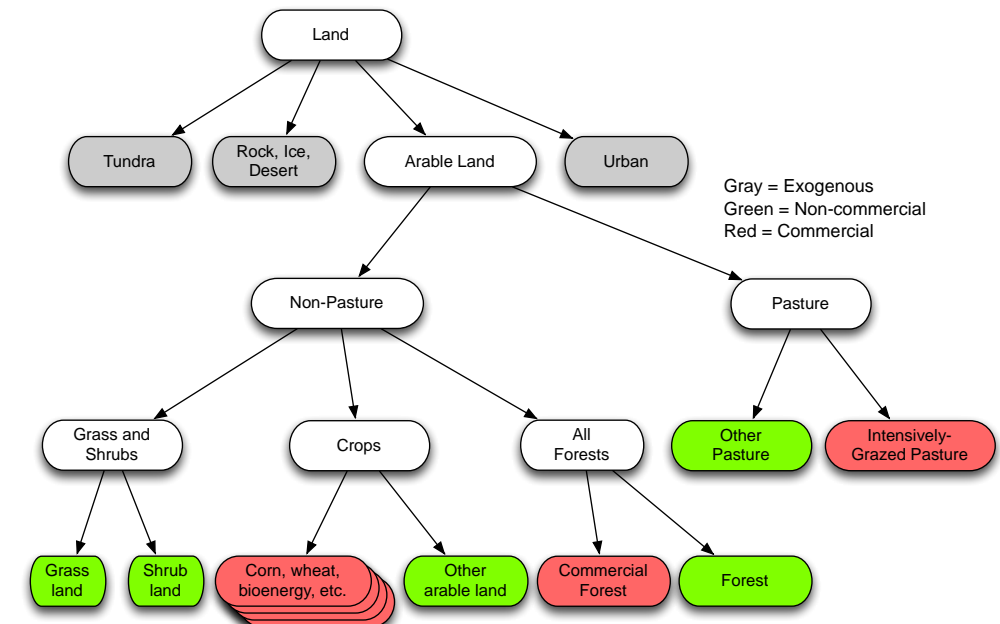
The Energy System



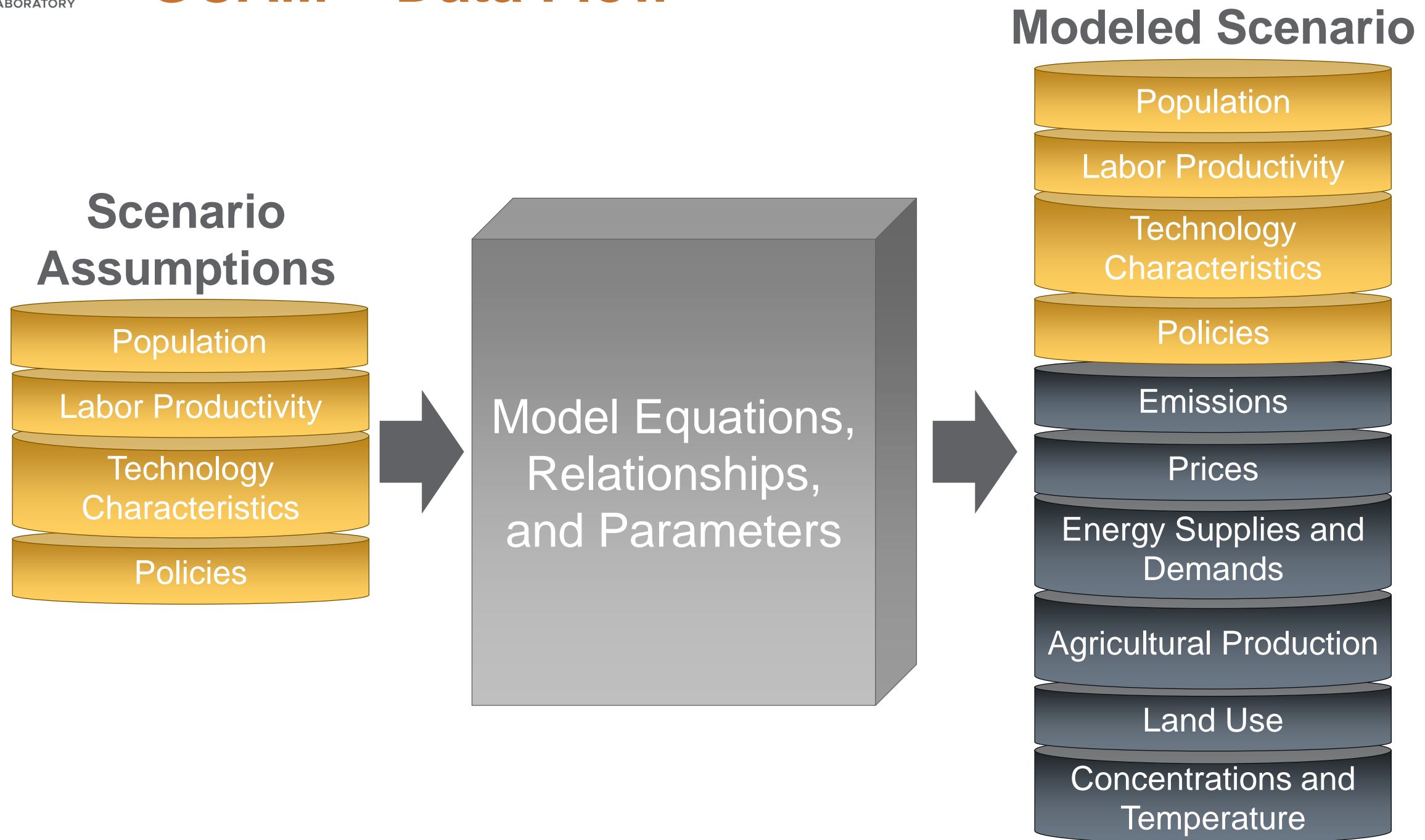
Water



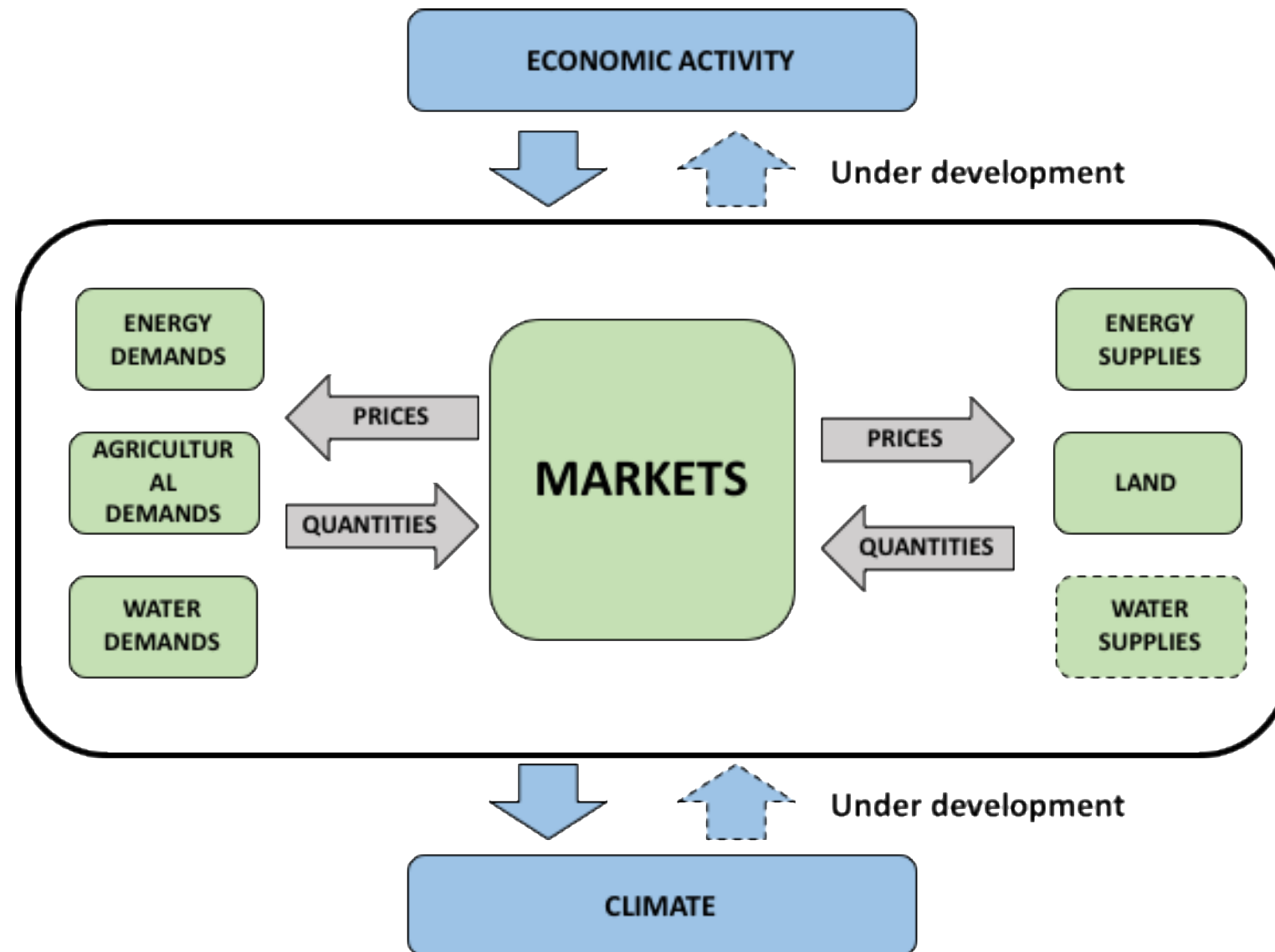
Land



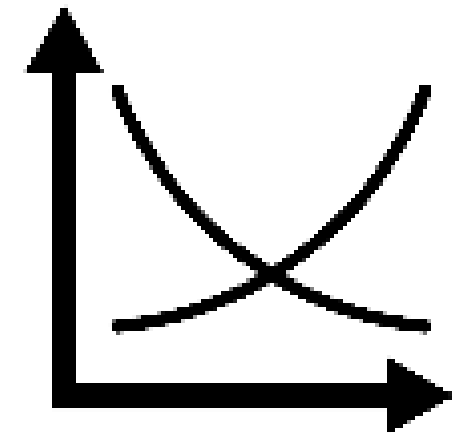
GCAM – Data Flow



GCAM – Modeling Framework

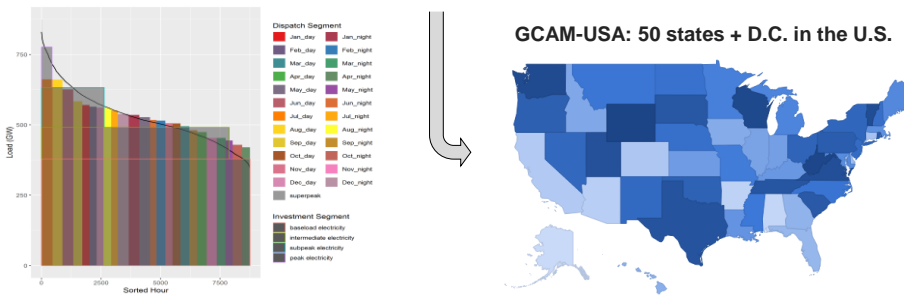


Market Equilibrium
Solution

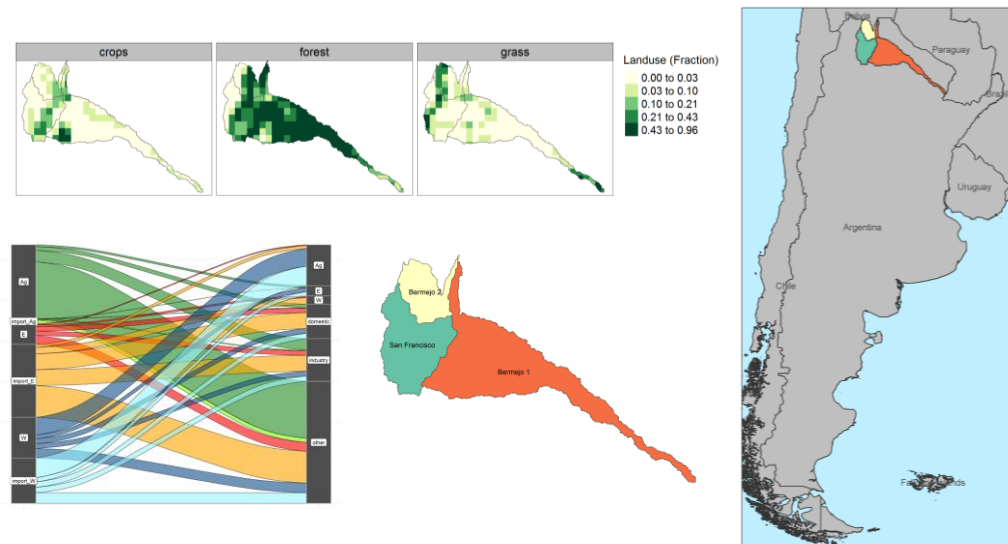


Example Projects

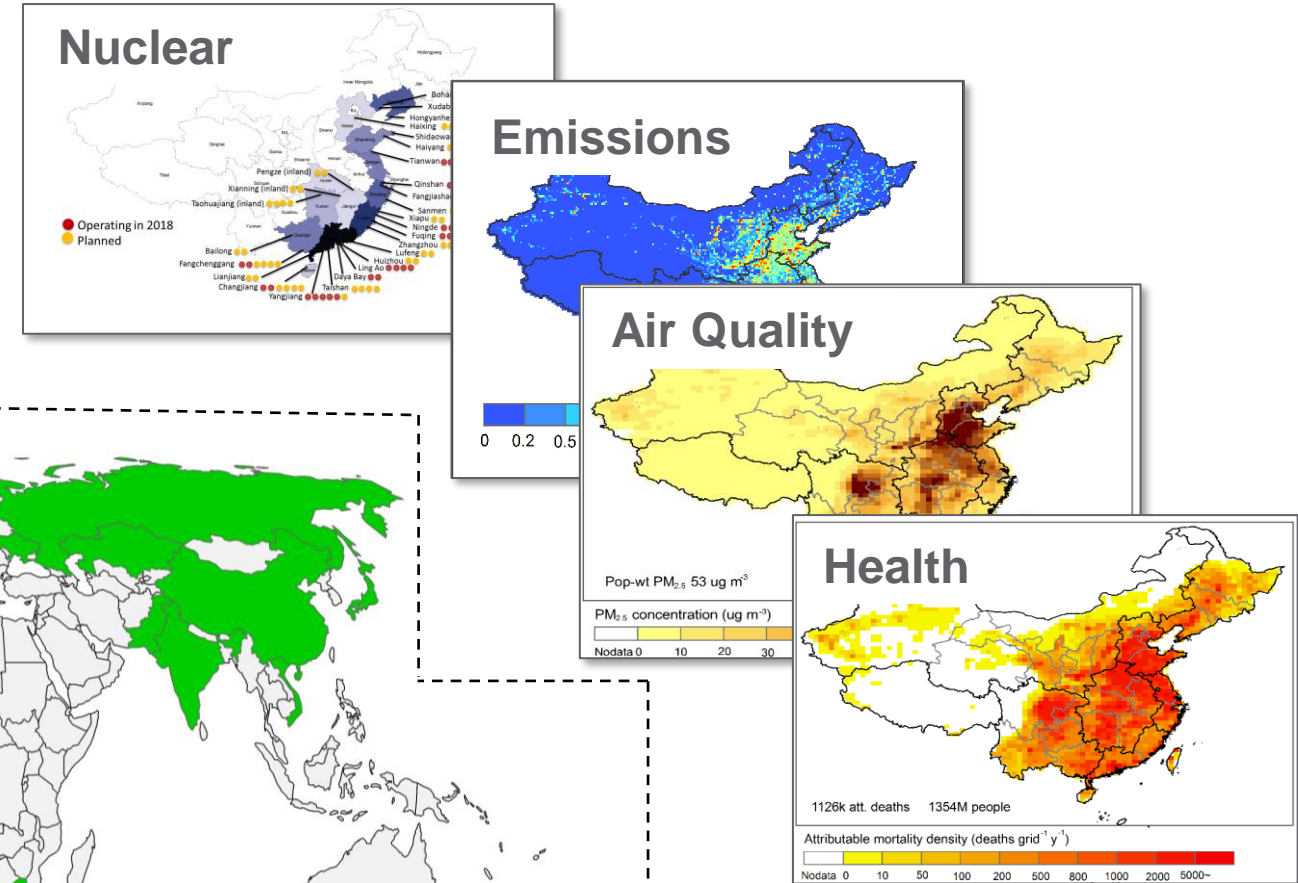
US – States – Sub-annual Electricity Dispatch Profiles



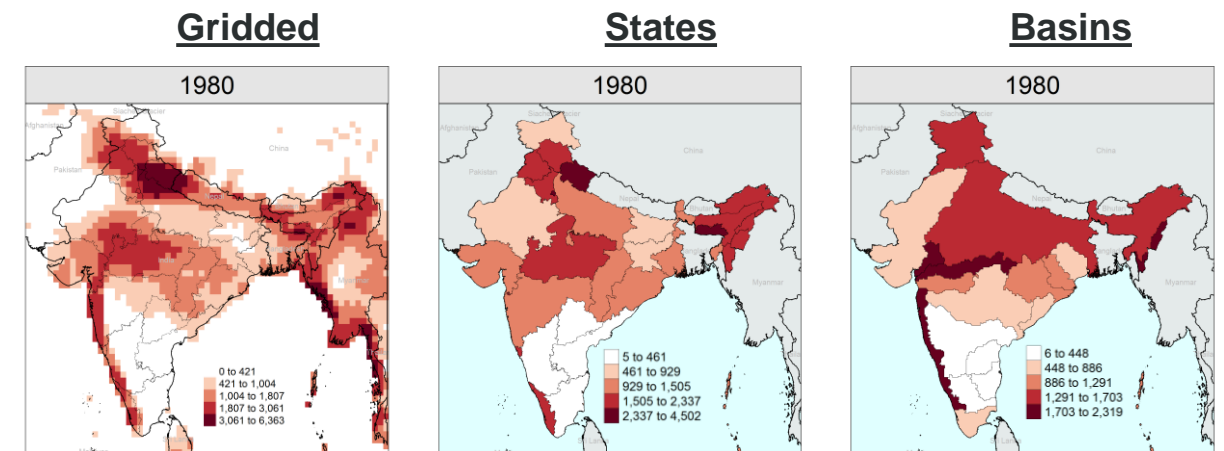
IDB – Sub basin – Nexus



China – Provincial – Emissions/Health



India – States/Basins – Water Scarcity



Conclusion

- GCAM is an Integrated Assessment Model used to capture long term multi-sector global dynamics
- Represents socio-economics, energy, water, agriculture, land-use, water and climate systems.
- Dynamic recursive model operating on 5 year time steps, with 32 energy-economic regions, 235 water basin and 384 land-use regions.
- Solved using a market-equilibrium approach to balance demands and supplies in regional markets for different commodities.
- Open source: <https://github.com/JGCRI/gcam-core/releases>
- Extensive Documentation: <http://www.globalchange.umd.edu/gcam/>
- GCAM wiki page: <http://jgcri.github.io/gcam-doc/>

Thank you

