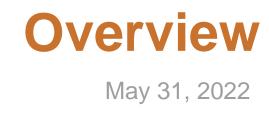


GCAM 5.4







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



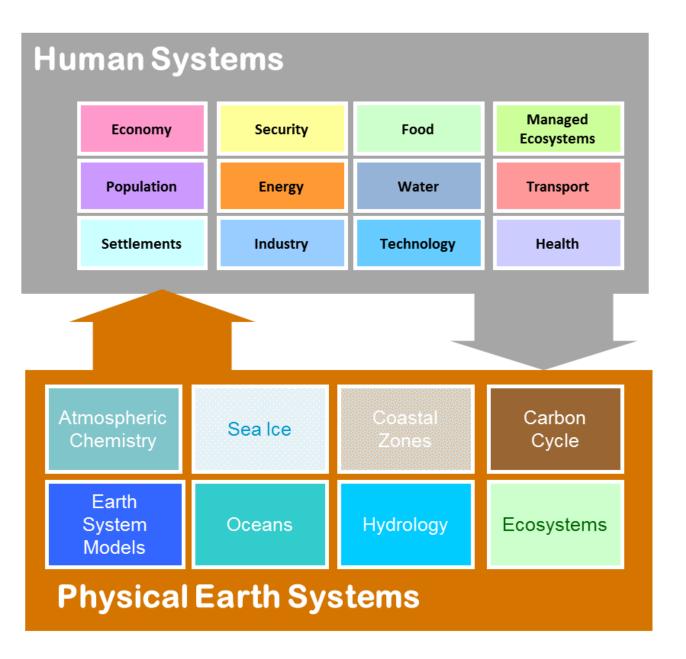
Contents

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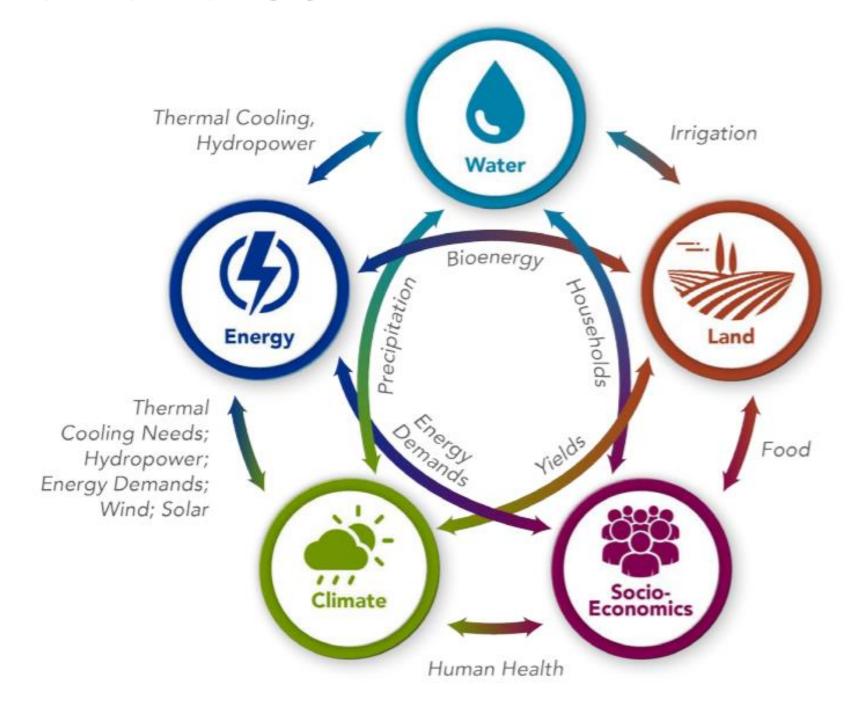
Introduction – Integrated Assessment Models (IAMs)

- 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

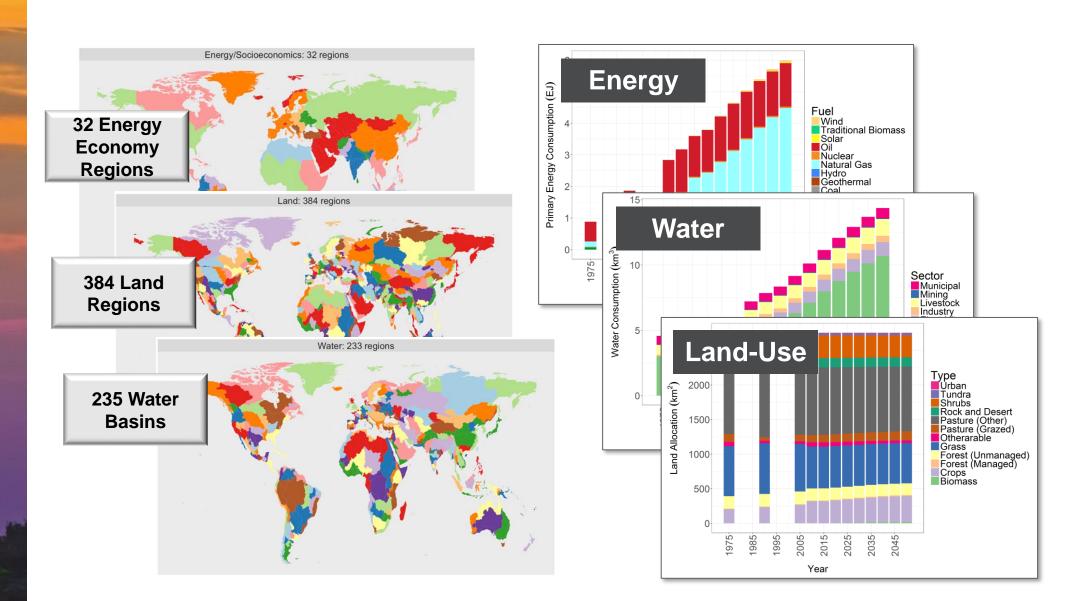


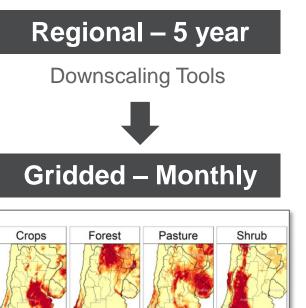


GCAM

GCAM is a global long-term integrated assessment model

GCAM links Economic, Energy, Land-use, Water, and Climate systems

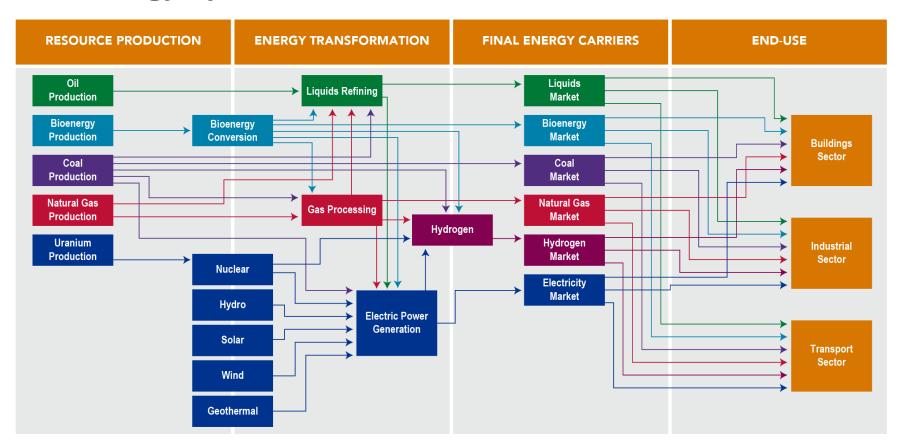




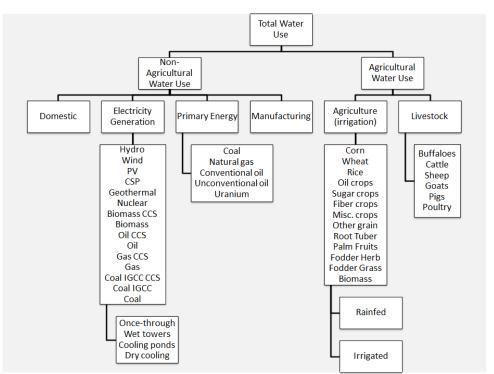


GCAM - Systems

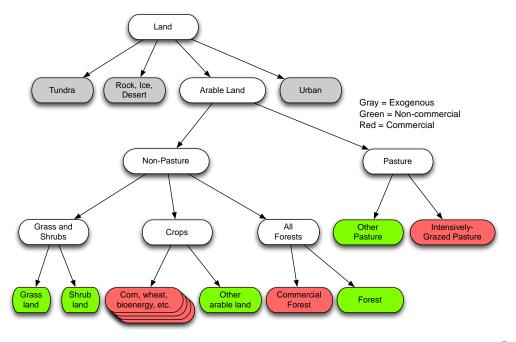
The Energy System



Water



Land





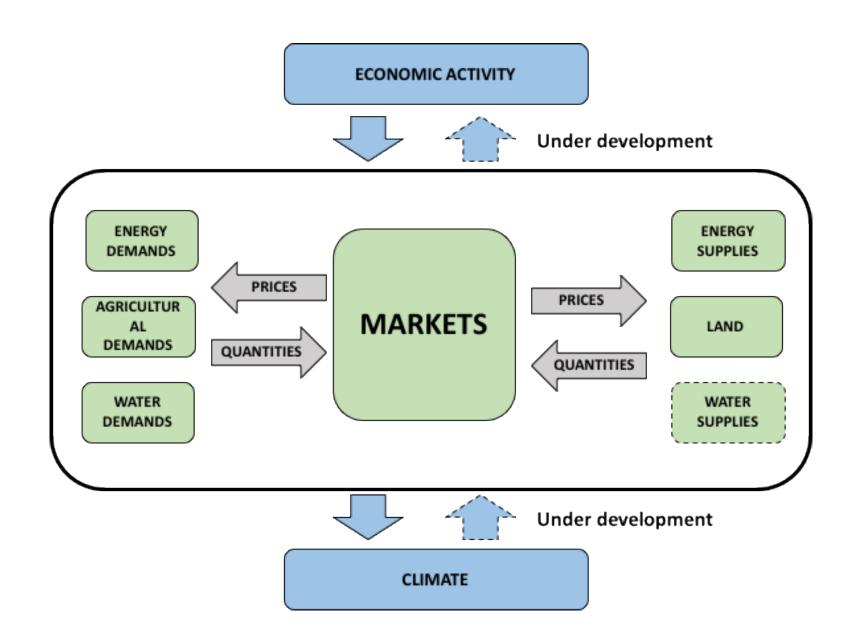
GCAM – Data Flow

Population Labor Productivity Scenario Technology **Assumptions** Characteristics Policies Population **Emissions Labor Productivity** Model Equations, Technology Relationships, Prices Characteristics and Parameters **Energy Supplies and** Demands Policies Agricultural Production Land Use Concentrations and Temperature

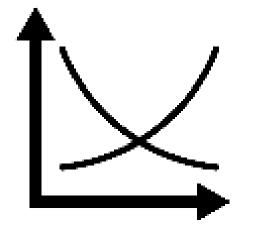
Modeled Scenario



GCAM – Modeling Framework



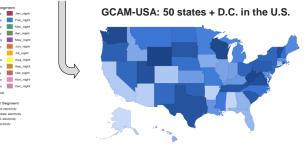
Market Equilibrium Solution



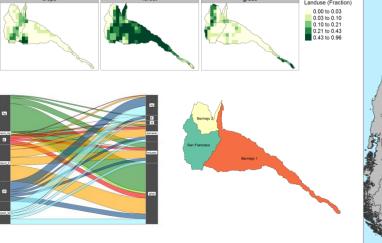


Example Projects

US – States – Sub-annual Electricity Dispatch Profiles GCAM-USA: 50 states + D.C. in the superint of the states in the superint of the superi



IDB – Sub basin – Nexus

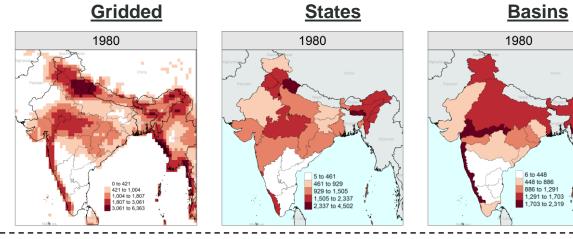




China – Provincial – Emissions/Health Nuclear Emissions Air Quality 0 0.2 0.5 Health Pop-wt PM_{2.5} 53 ug m³ PM_{2.5} concentration (ug m⁻³)

Attributable mortality density (deaths grid 1 y 1)

India – States/Basins – Water Scarcity





Conclusion

- GCAM is an Integrated Assessment Model used to capture long term multisector 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

