

The first decade of ARIES: redefining the narrative and the tools

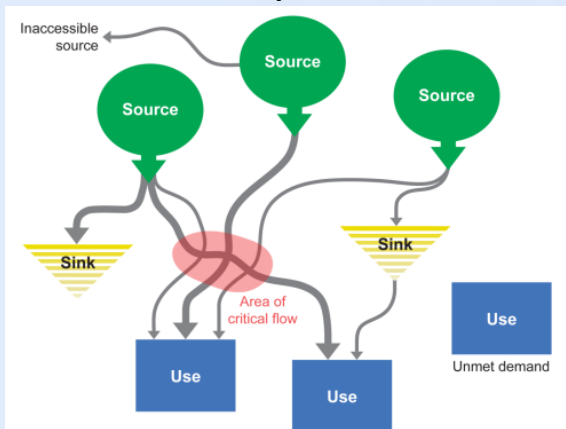
The science

A revised ES narrative:

- Flows, not stocks
- Explicit uncertainty
- *System to indicators* – not vice-versa
- ES as network of agents

Using:

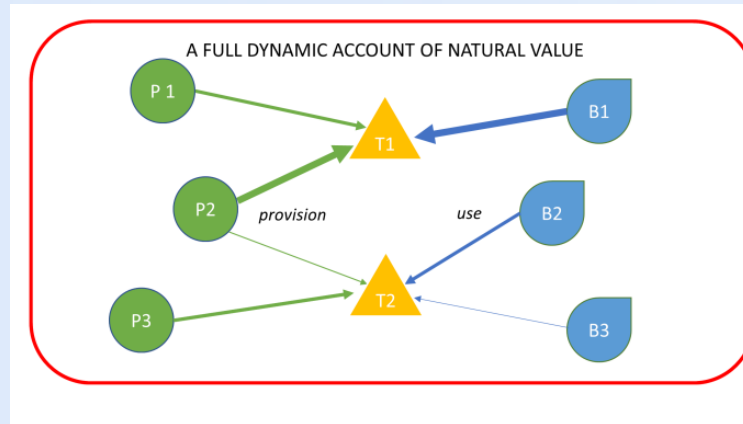
- Machine learning (Bayesian and beyond)
- Multi-paradigm models
- ES flow dynamics



The technology

Outsourcing complex modeling tasks to artificial intelligence:

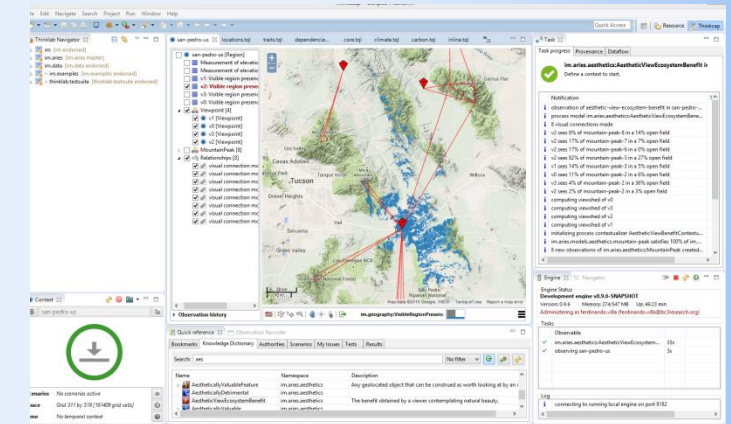
- Integrated modular modeling,
- Build adaptive models from components
- Choose best data/models for the context
- Collaborative development
- Distributed execution



The community

It's not "our model" but your models:

- Web-based data
- Web-based model components
- Collaborative modeling
- Open source software
- Yearly modeling school
- A web-based use paradigm





A roadmap for ARIES: covering the full arch of ES assessment needs

Supply/Use/Balance models

optimized for NCA and comparability

- No input needed
- Easily customized
- Arbitrary resolutions
- Adaptive modeling
- Consistent outputs
- MCA for trade-offs
- Automated reporting

Remote sensing-driven models

the most current information

- Responsive and current
- Machine learning to “socialize the pixels”
- Using volunteered information
- Fine resolution based on Sentinel/Copernicus/Landsat
- Automatic re-evaluation
- Archiving and change tracking

Agent-based models

providers, beneficiaries, transactors

- Automatic switch at smaller scales
- Track individual agents and their interactions
- Compute individual flow paths
- Scenario analysis including dynamic factors and events

Coarser temporal/spatial scale

Fine scale, higher detail, dynamics

AI-assisted, unchanging complexity for the user: toolset includes web-based explorer and modeler UI

Rapid assessment (no input) -> Use own data -> Choose scenarios -> Develop scenarios -> Tradeoff analysis -> Dynamic prediction

