**The PECAn Project: Accessible Tools for On-demand Ecosystem Modeling**

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### Why PECAn?

**The Predictive Ecosystem Analyzer (PECAn)** is an ecoinformatics toolbox and a set of workflows that wrap around an ecosystem model and manage the flow of information in and out. The PECAn Project was initiated to address the current bottlenecks of ecological modeling.

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### Model Uncertainty

We lack agreement amongst current earth system models over cumulative land carbon uptake. Little progress has been made in the last decade.

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### Long Tail Data

- **Size of Datasets**
  - Large, organized and accessible data
  - Small, un-curated and unpublished data

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### Accessibility

- **Provenance & Repeatability**
  - Synchronization of PECAn servers allows for the sharing of information across teams
- The input data, model and output data can live on different servers

- **Scalability**
  - Generalized workflows work with any model at any site

- **Usability**
  - PECAn is designed to be used by scientists with expertise in disciplines besides modeling

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### References


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### PECAn Workflow

**Plant Trait Data**

- Build parameter distributions from trait data using a hierarchical Bayesian meta-analysis model

**Sensitivity & Uncertainty Analysis**

- Evaluate how a specific model output (in this case NPP) changes as the parameter changes

**Variance Decomposition**

- Estimate the uncertainty in model predictions associated with each model parameter

**Ensemble Estimates**

- Return posterior predictive distributions of ecosystem responses that account for trait parameter uncertainty

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### Brown Dog

**“Brown Dog aims to provide and preserve long term access to data within collections of unstructured and uncurated files.”**

- The Data Access Proxy (DAP)
  - A file format conversion service
- The Data Tilling Service (DTS)
  - Active repository for analysis tools
  - Service for extraction of metadata and content signatures

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### Curating Meteorological Data

- Currently Site-Level Support
- Ameriflux
- Free-Air Carbon Dioxide Enrichment Sites (FACE)
- CSV-formatted (pre-registered with PECAn)
- Current Regional Support
- North American Regional Reanalysis (NARR)

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pecanproject.org