Motivation: Understanding the impacts of climate change on natural and human systems poses major challenges as it requires the integration of models and data across various disciplines, including hydrology, agriculture, ecosystem modeling, and econometrics.

Proposed approach: The Model INTEGRation (MINT) framework utilizes semantic representation to describe datasets and models to support modelers in data search and transformations, model selection and set up, ultimately combining them into workflows for execution and visualization of the results. MINT is designed both for modelers and analysts, who ultimately propose a range of solutions to the decision makers.

1. Identify and prepare relevant models

   **Model Catalog**
   Representing knowledge about models
   1. Data formats
   2. Model variables
   3. Constraints
   4. Adjustable parameters
   5. Interventions
   6. Execution of ensembles
   7. Data preparation
   8. Post-processing
   9. Calibration
   10. Sensitivity analysis

2. Browse and prepare datasets

   **Data Catalog**
   The MINT data catalog allows to learn about the different datasets available on the platform.

3. Run models

   **Theory-Guided Data Science**
   We use physics-guided neural networks (Karpate et al., 2017) to generate physically consistent models of river width and depth.

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