Advanced Use and Concepts

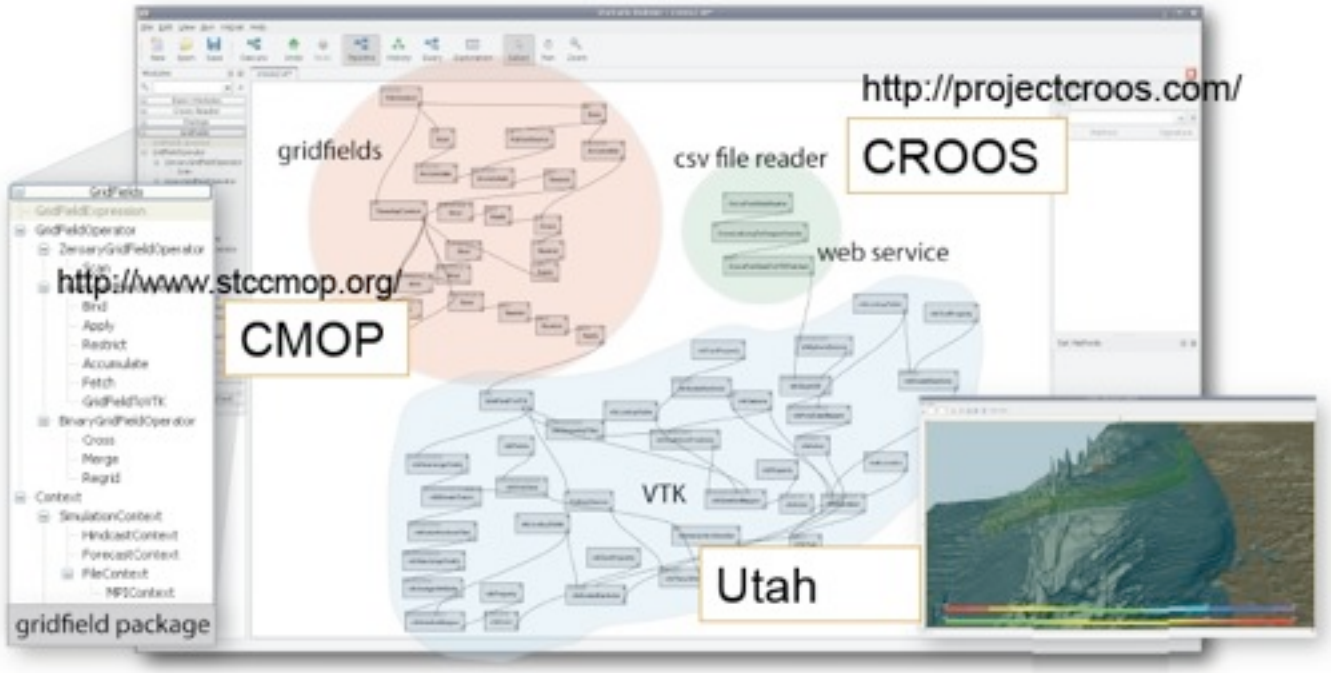
Advanced features of VisTrails

Agenda

- Case-study overview
- Organizational Principles and Practices
- Automatic creation of new workflows
- Advanced Interaction – Part 1
- Advanced Interaction – Part 2
- The workflow debugger

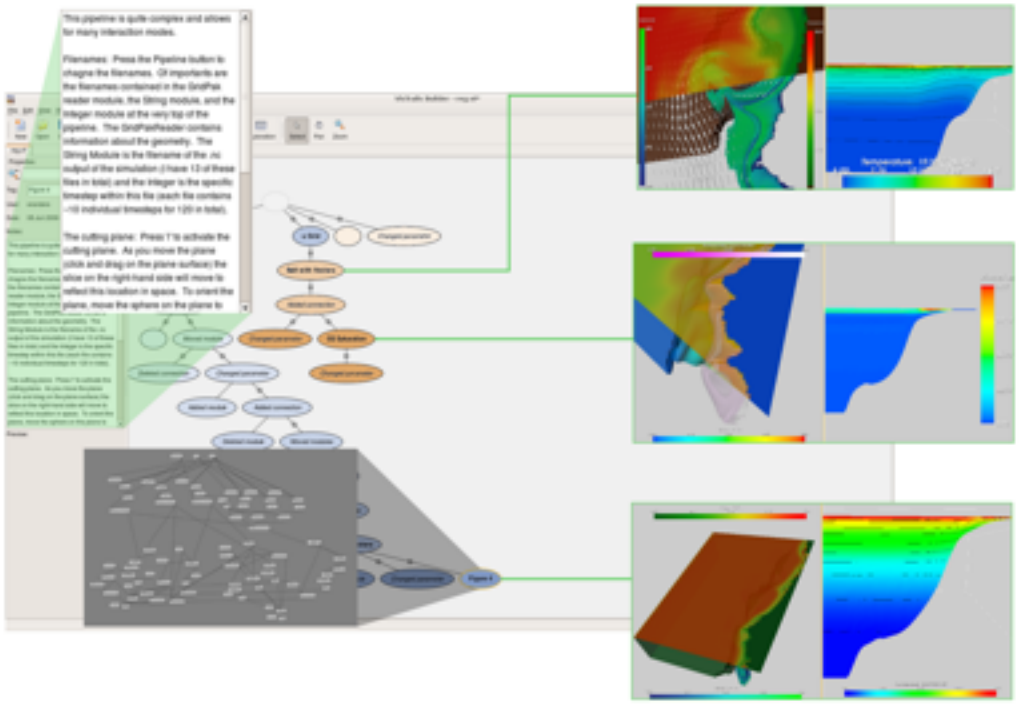
CMOP – A VisTrails example

- Coastal Margin Observation and Prediction
  - Large, multi-modal simulations combined with observational data



CMOP – Provenance enhances collaboration

- Operations and analyses must be recorded and shared
  - Complexity of data and simulation make automatic logging necessary

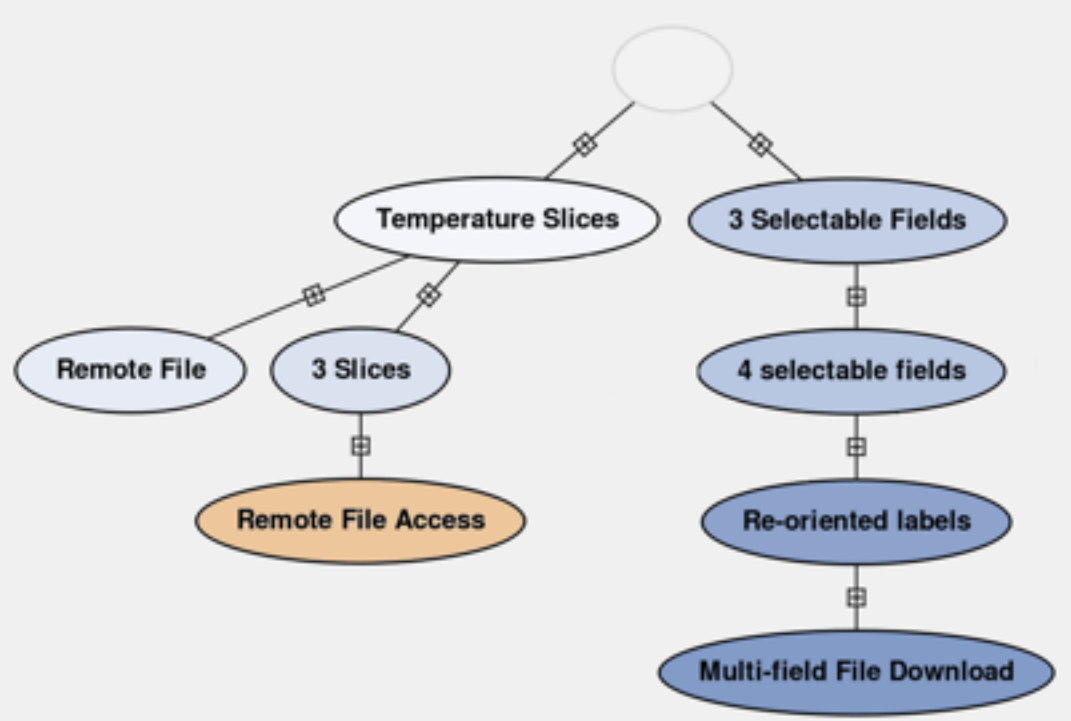


Organizational Principles

Methods of organization for better integration

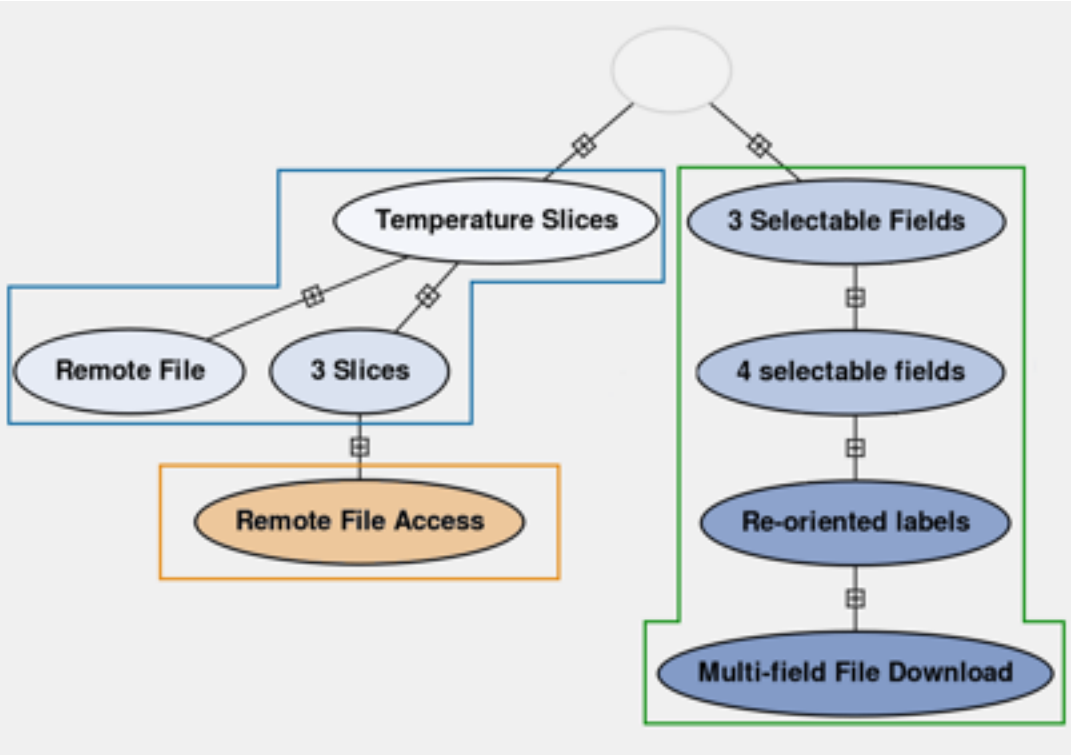
The Version Tree

- Not a “flat” description.
  - Advantageous to use one .vt file for many workflows!



Using the Version Tree

- Proper organization enables
  - Querying
  - Analogies
  - Collaboration



Creation of Workflows

Automatically create complex workflows from simpler building blocks

Demo 1

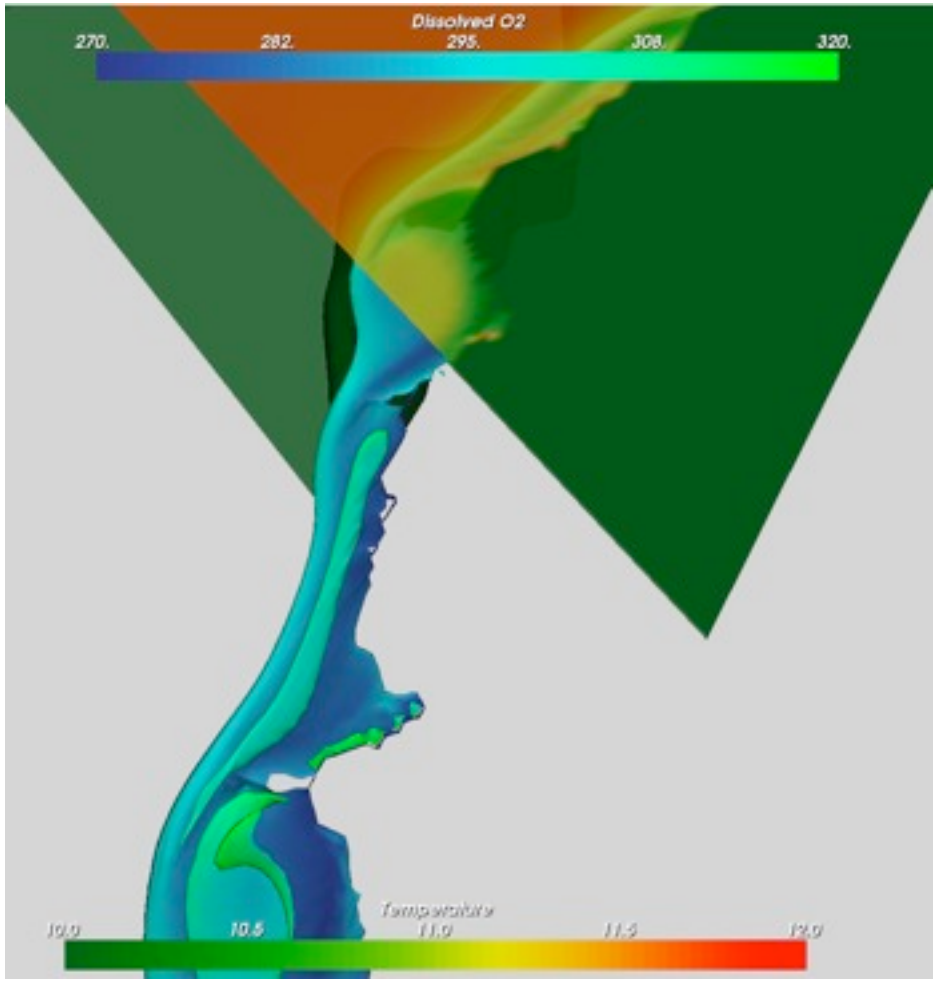
- Using an organized Version Tree to enable searching, querying, and workflow refinement
  - Examples of query-by-example, query-by-user, refinement by parameter exploration, visual diff, refinement by analogy

Advanced Interactions

Enabling VTK Widgets in VisTrails

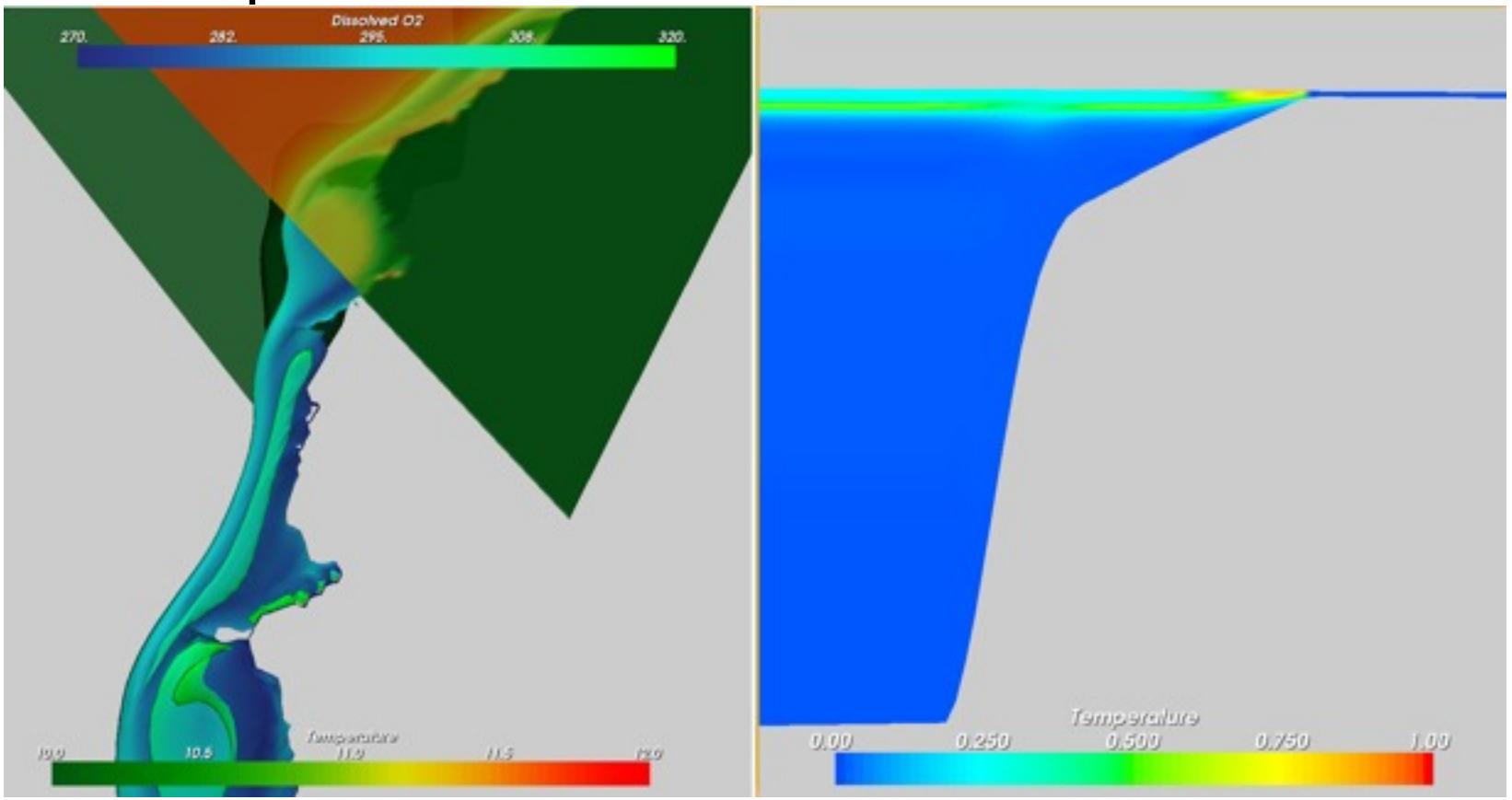
Cutting Planes

- Interaction Handlers
  - Code required to allow specified interactions



Slicing Data

- Multiple Interaction Handlers



Demo 2

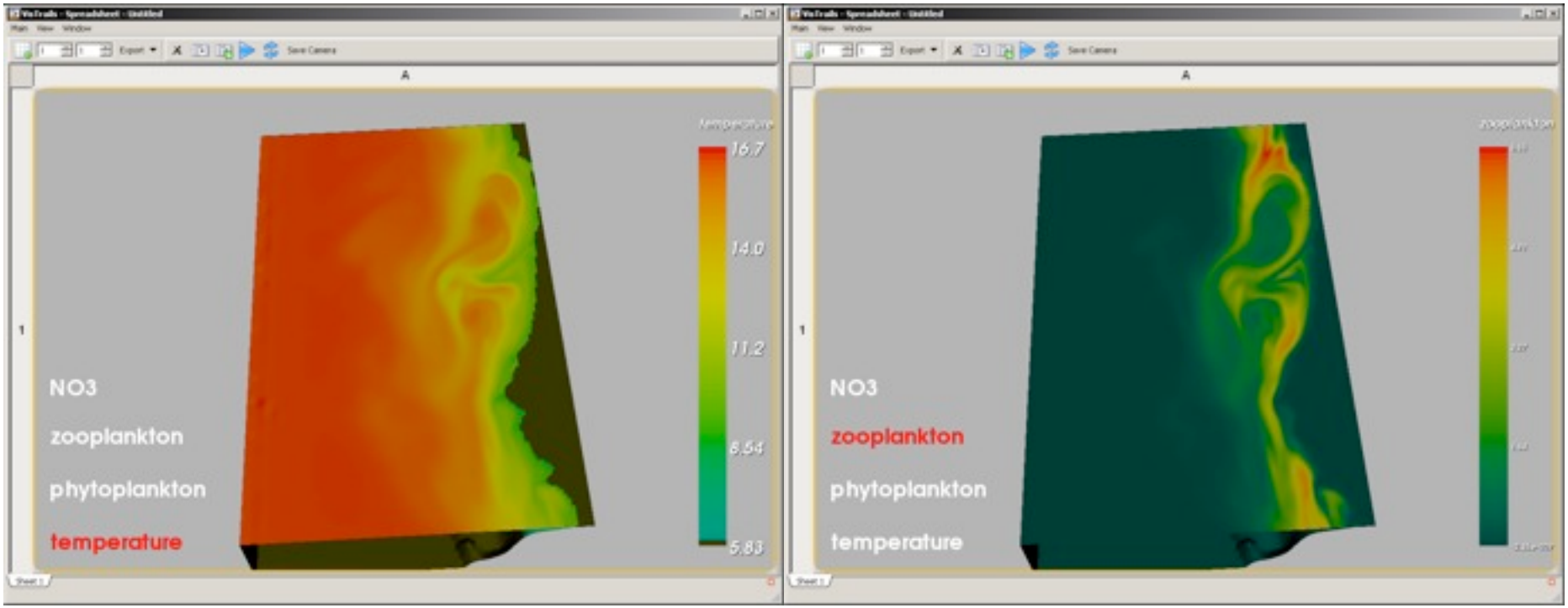
- Supporting basic interaction techniques with vtkInteractionHandler Modules
  - Examples of cutting planes, seeding planes, and slicing widgets using the observer pattern in VTK

Advanced Interactions

Enabling interaction through the callback mechanism

Picking

- Picking is implemented in VTK
  - Any library supporting callbacks uses this mechanism!



Demo 3

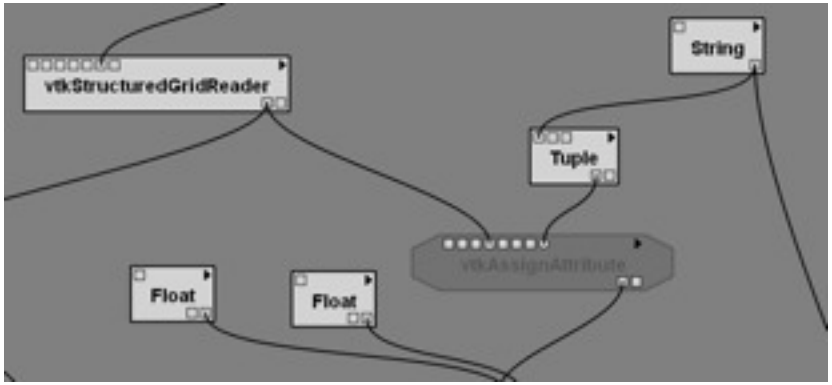
- Supporting advanced interactions with the callback mechanism
  - Example of picking using PythonSource and the VTK callback mechanism

The workflow debugger

Start, pause, and investigate workflows

Debugging

- Breakpoints and watchpoints
  - Workflow analogues to source-code versions



Demo 4

- Debugging and inspecting workflows
  - Example of advanced use of the workflow debugger and console. Querying arbitrary module inputs, setting breakpoints and watchpoints.