Introduction to Data Models and Cloud Computing

Landlab RasterModelGrid, HydroShare Resource Data Model, and cloud computing architecture on the CUAHSI JupyterHub server

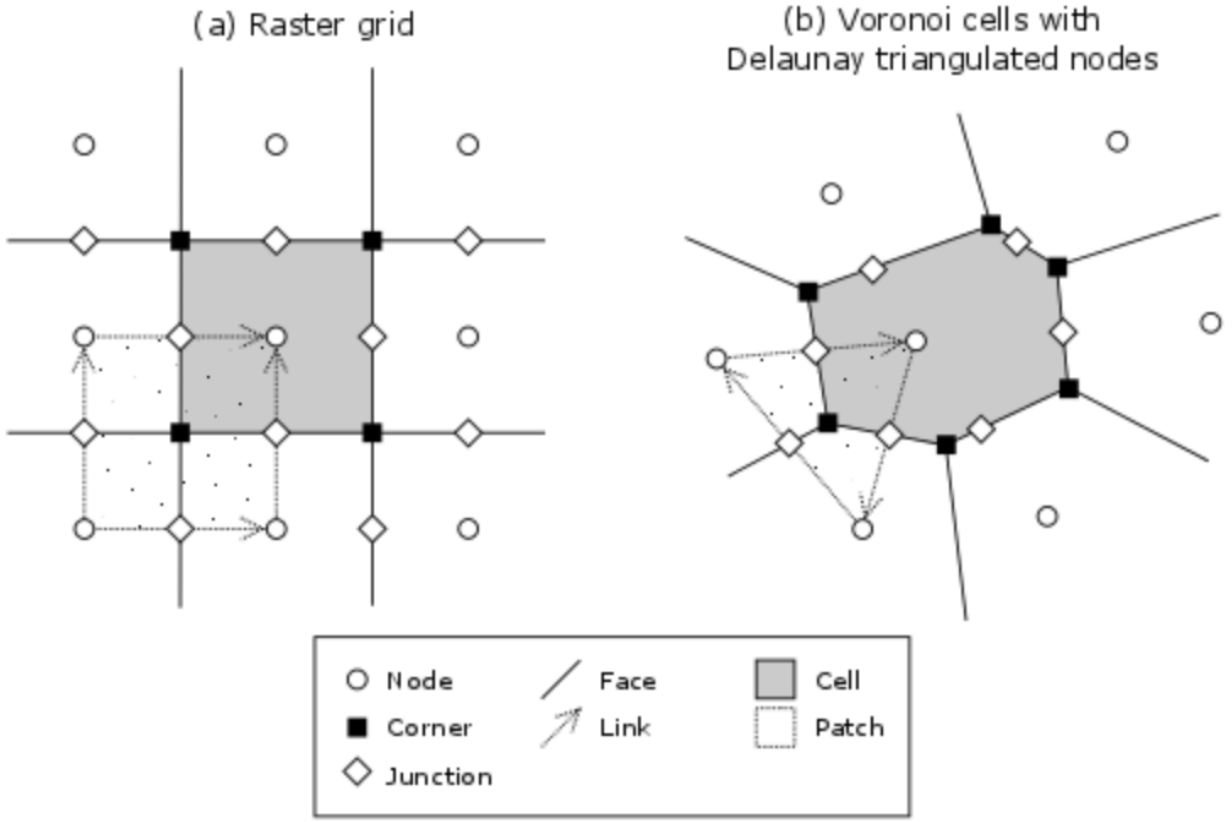
What is a data model?

- How you think about data
- an abstract model that organizes elements of data and standardizes how they relate to one another and to properties of the real world entities.
- Examples: excel, netdf, Landlab rastermodelgrid, HydroShare resource data model.

Example Data Models

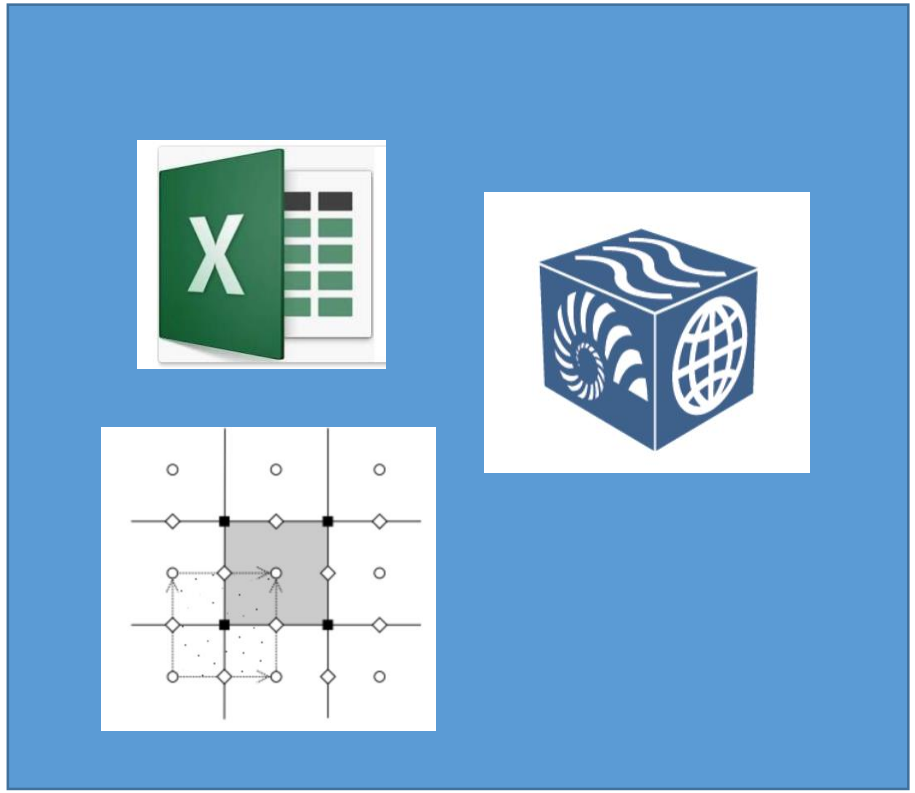
- 2D

- 3D



Resource Data Model= Social Object

- HydroShare resource = a digital package of data, metadata**, and sharing controls**



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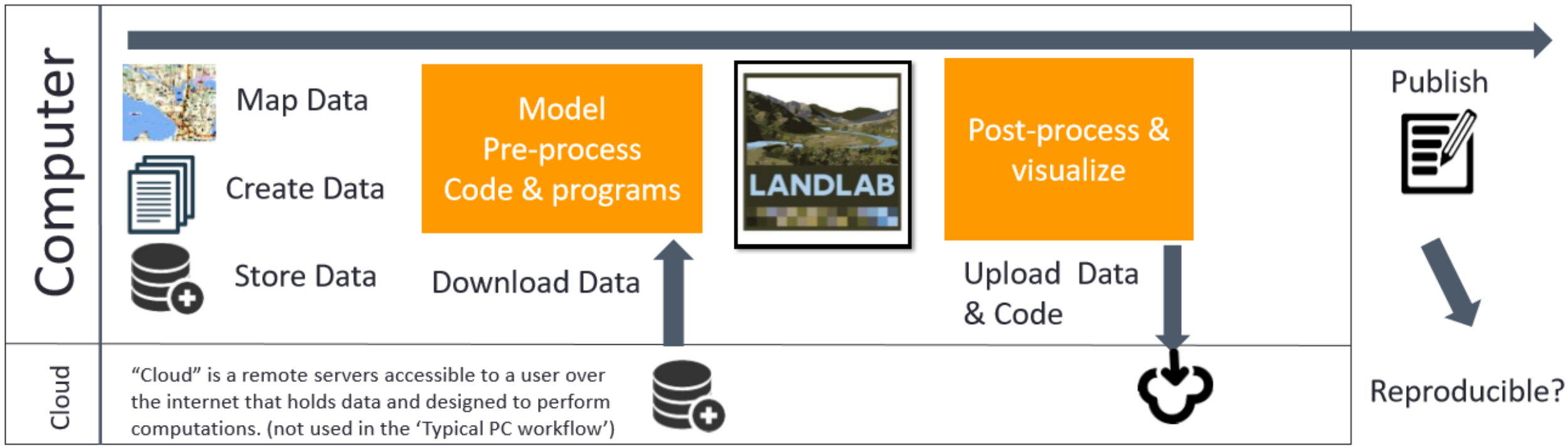
Resource specific metadata attached when you select the type: GIS, time series, composite, etc.

1. TYPICAL PC MODELING WORKFLOW

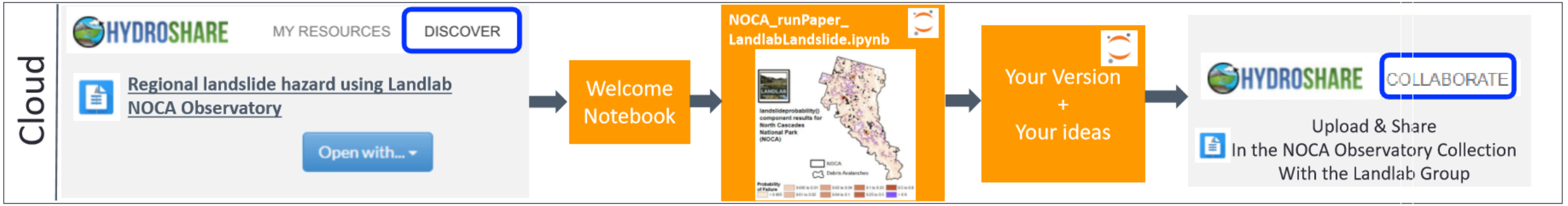


How the GSA tutorials are running now -

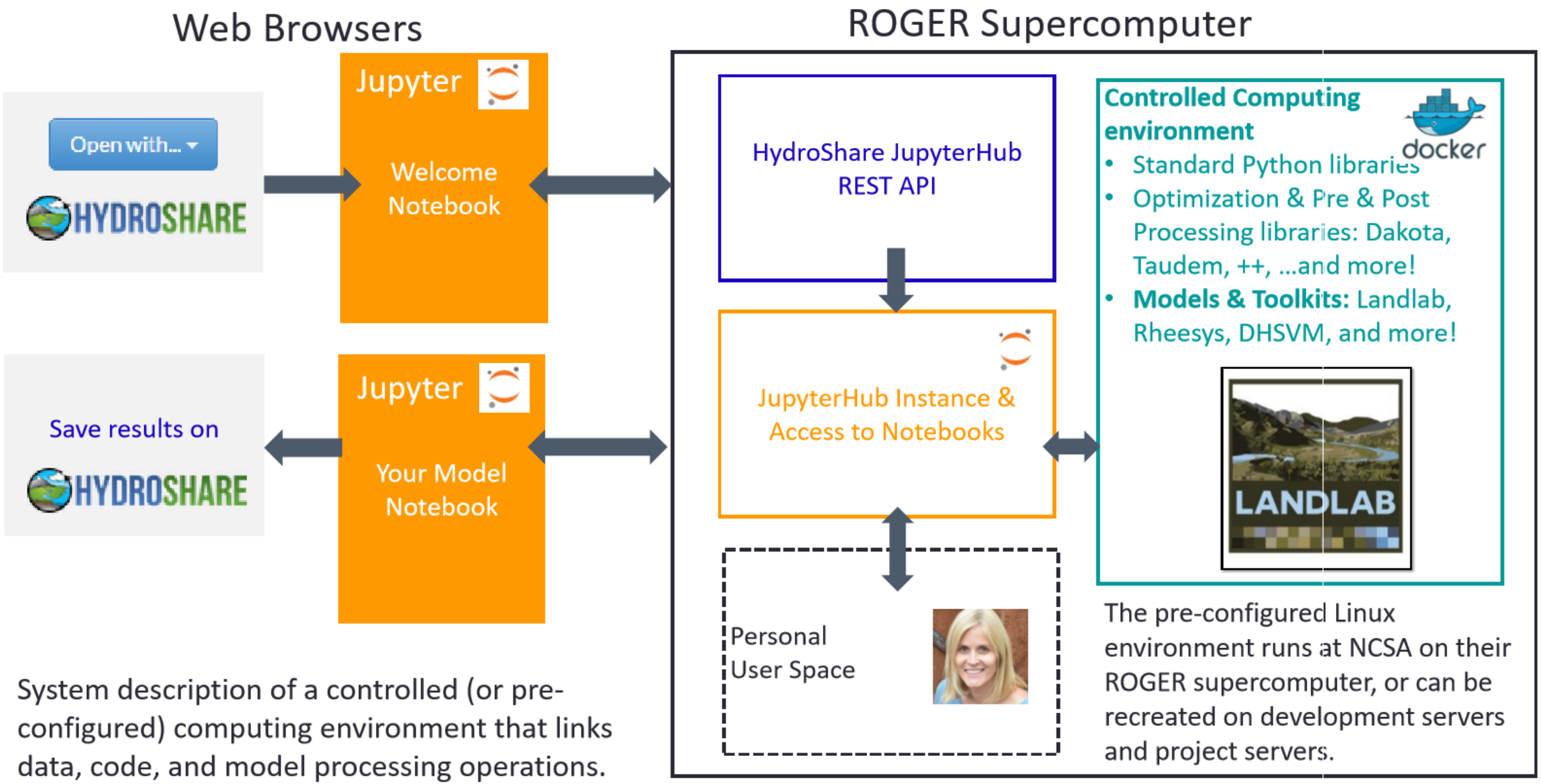
- Requires HydroShare User Sign up
- Landlab preference to organize using Groups
- Supported by NSF supported non-profit CUAHSI for any user – targeted features for academic hydrologic research

2. REPRODUCIBLE MODEL WORKFLOW

Replicate, reuse, and build on model results: Explore the data and model from a web browser. Create a personal version of the Notebook and model instance, and then Collaborate by adding new research to the NOCA Observatory Collection resource shared with modelers in the Landlab Group in HydroShare.



3. ARCHITECTURE FOR REPRODUCIBLE COMPUTING



System description of a controlled (or pre-configured) computing environment that links data, code, and model processing operations.