

4D: Overview of current work

Bay Oxygen Research Group

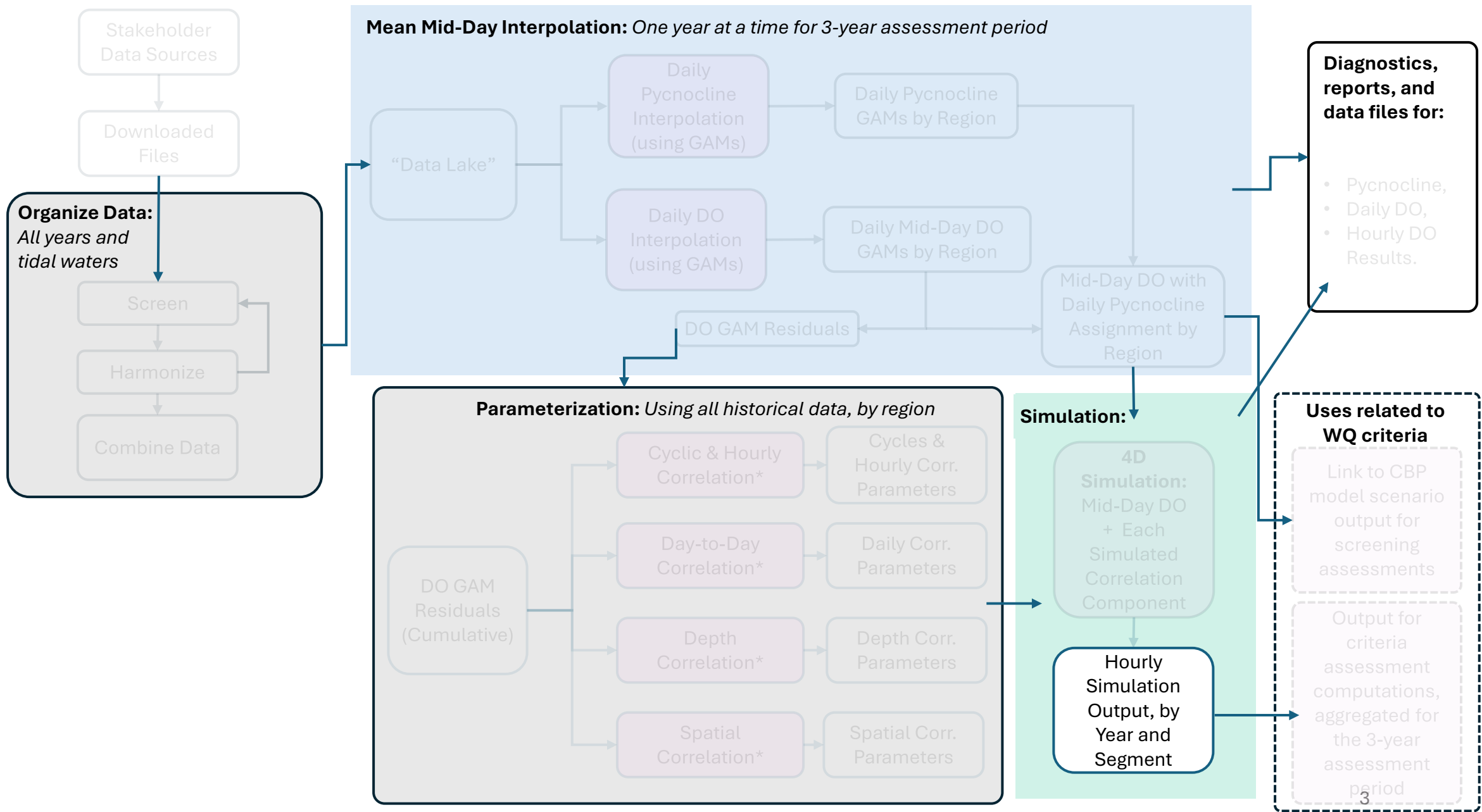
July 28, 2026

Rebecca Murphy (UMCES/CBP) for development team:
Jon Harcum (Tetra Tech), Elgin Perry (statistics consultant),
Peter Tango (USGS)

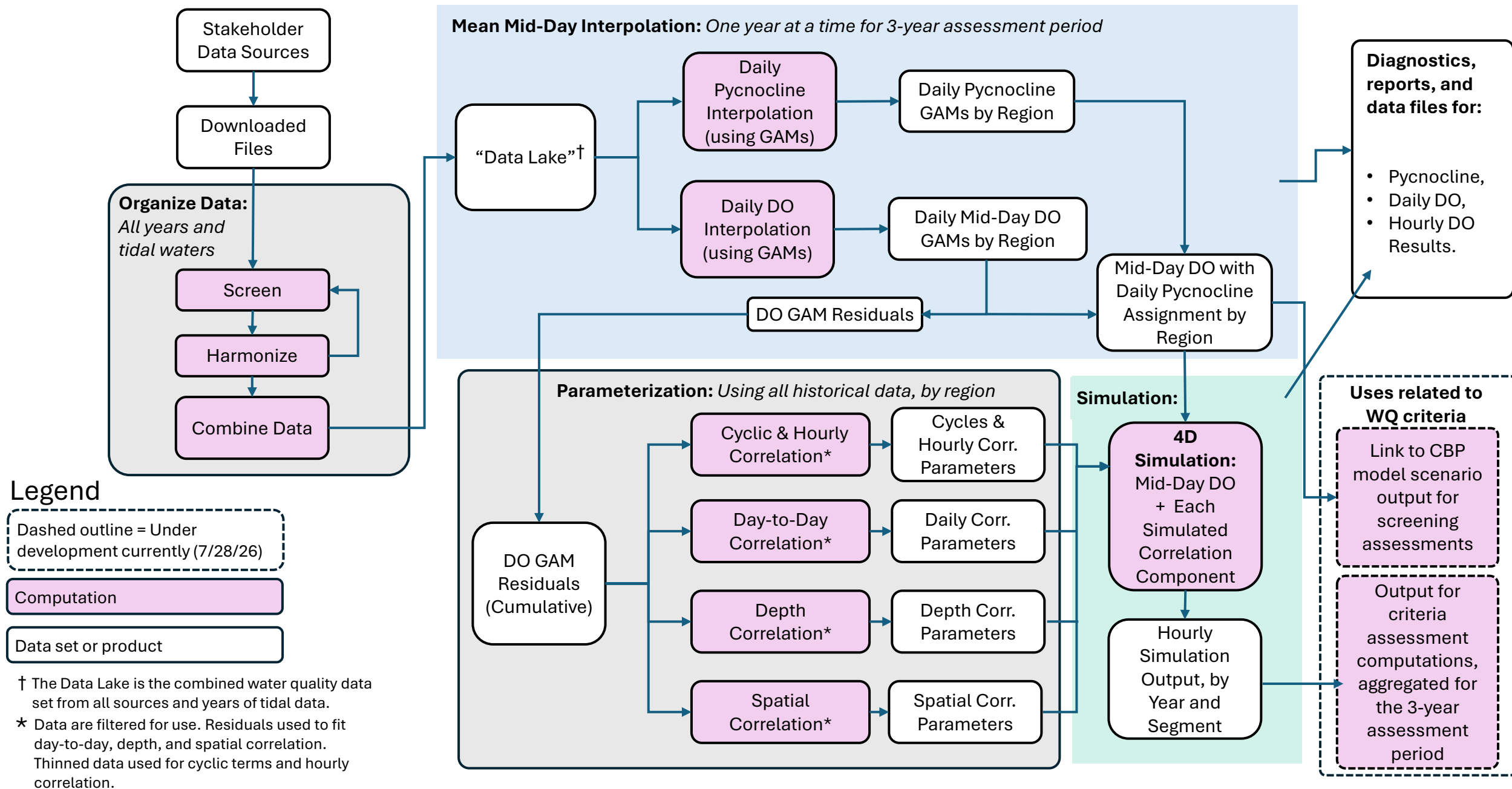
Outline

- Updated workflow diagram of the 4D tool:
 - See July 1 presentation for more background.
- Recent work and next steps.
- Jon: Zoom-in on details for one correlation parametrization:
 - Depth correlation.

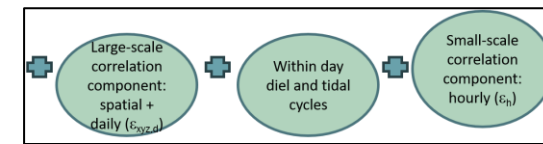
4-D Interpolator Workflow



4-D Interpolator Workflow

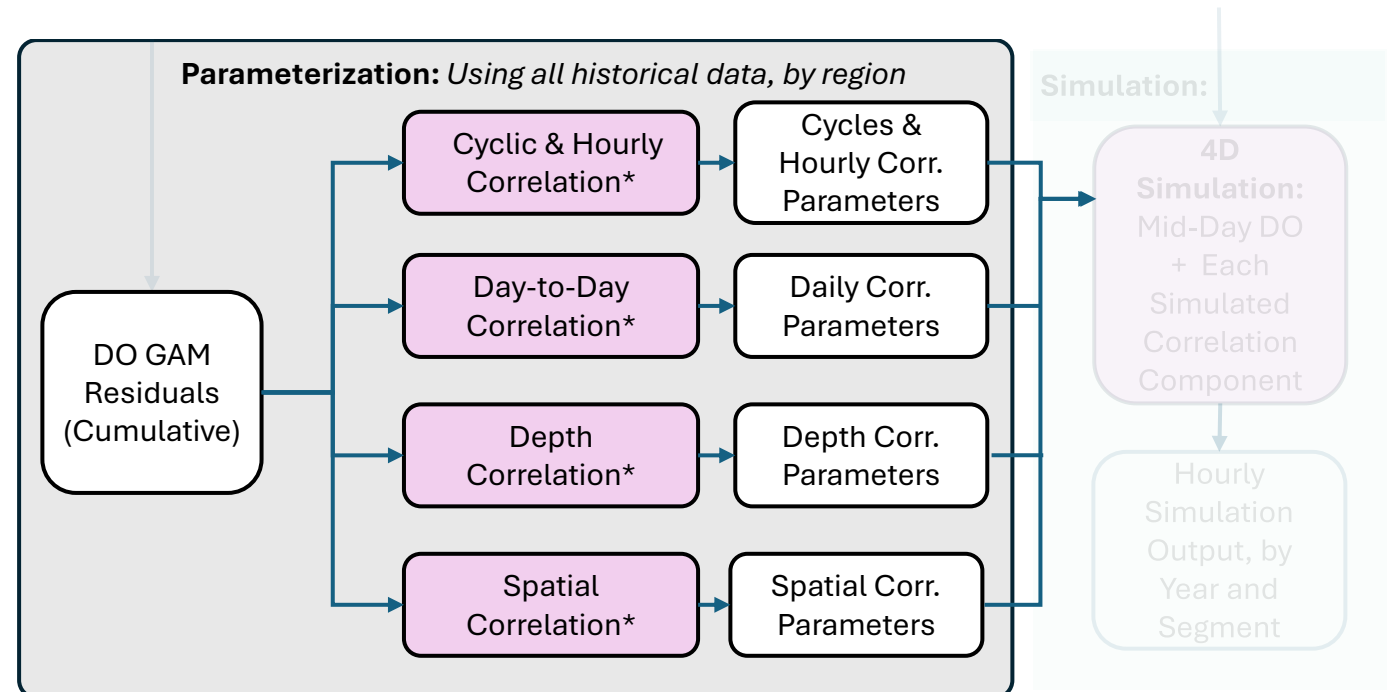


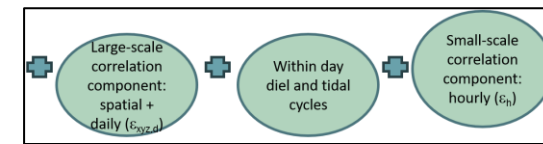
Recent work: Parameterization



- Compute correlation parameters from all residuals generated from fitting mid-day DO GAM;*
- Find appropriate explanatory variables (e.g., day of year, depth) and GAM structure;
- Fit selected GAM to estimate correlation over each segment interpolation region (seg_int_reg);
- Take the median of the GAM estimates to generate 1 representative parameter value for each segment, for each of the necessary parameters.
- Set up this workflow so parameters can be updated with new data.

*Data are filtered for use. Residuals used to fit day-to-day, depth, and spatial correlation. Thinned data used for cyclic terms and hourly correlation.

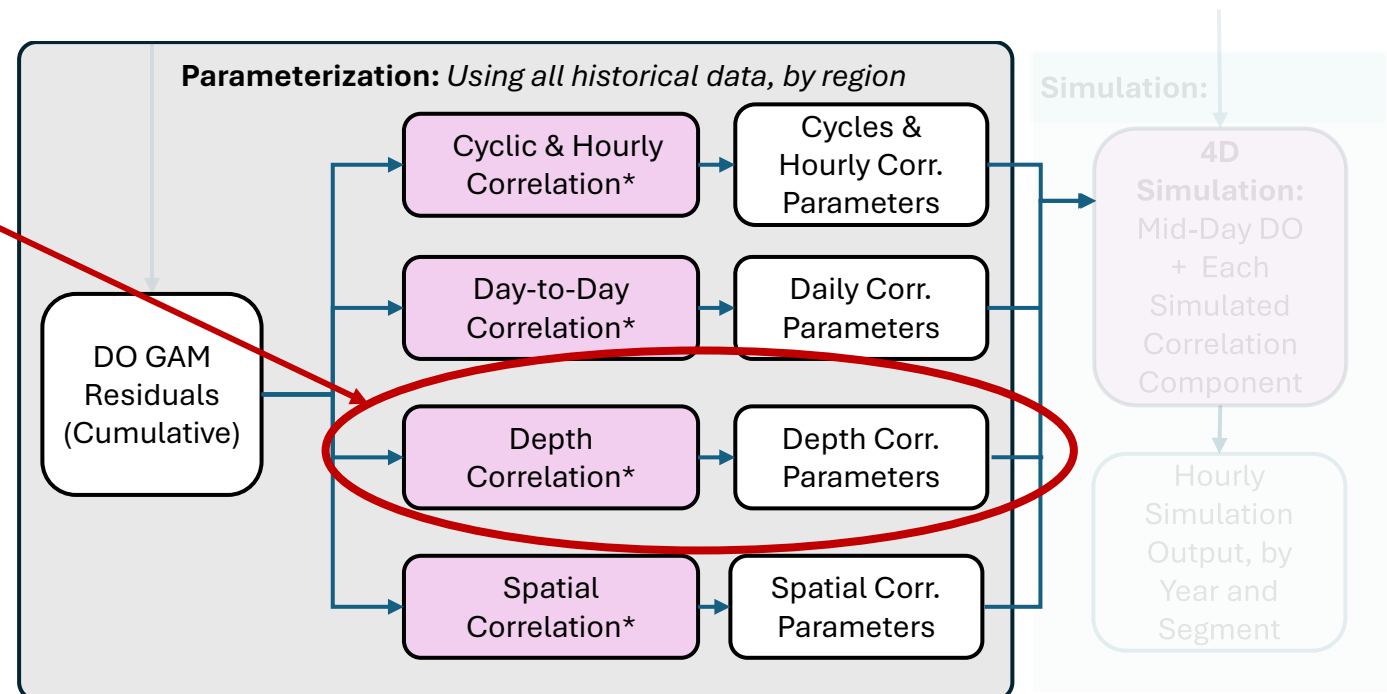




Recent work: Parameterization

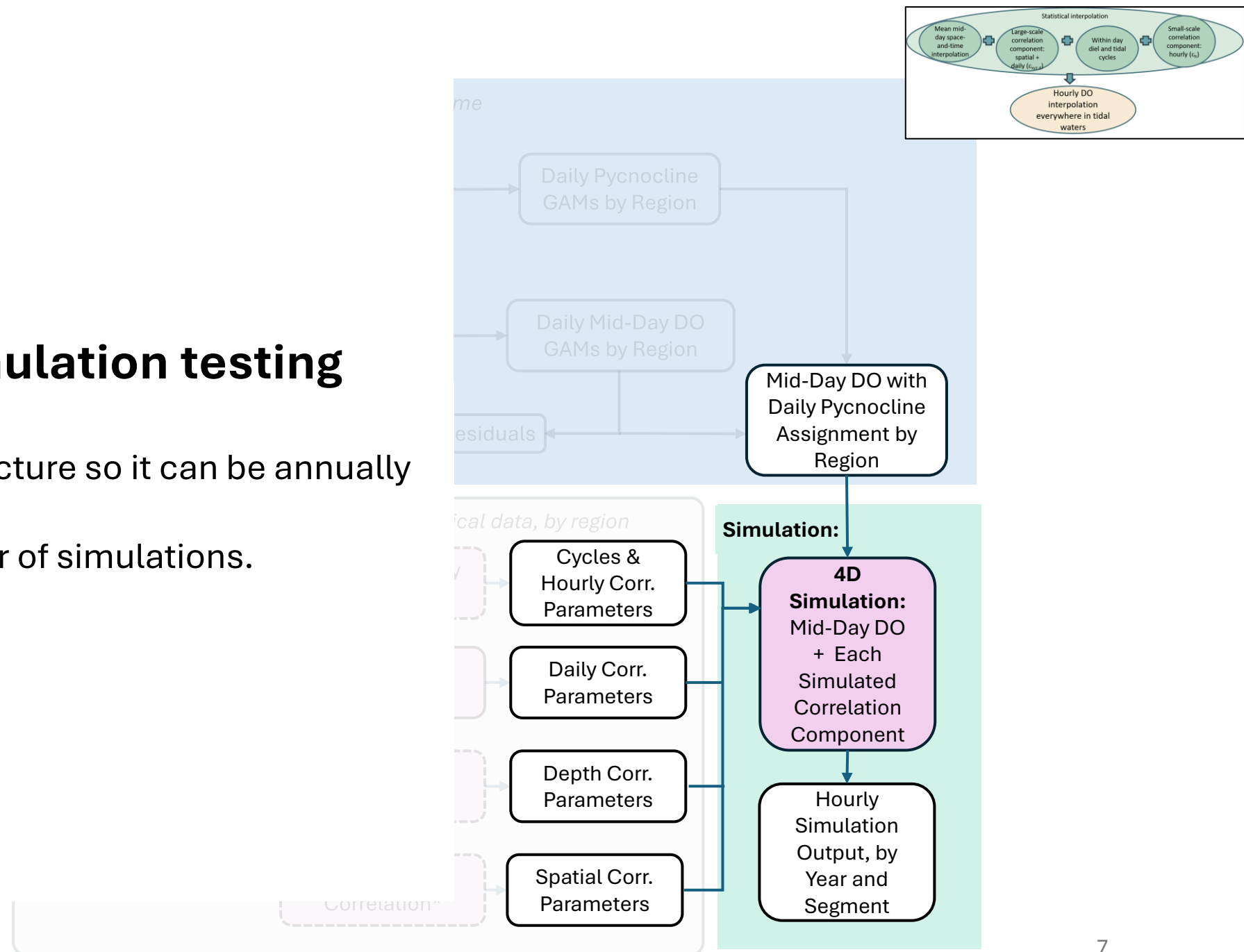
- Compute parameters from all residuals;
- Find appropriate explanatory variables (e.g., day of year, depth) and GAM structure;
- Fit selected GAM for each region (seg_interp_reg);
- Take the median of the GAM estimates to generate 1 representative parameter value for each segment, for each of the necessary parameters.
- Set up this workflow so parameters can be updated with new data.

In the next presentation today, Jon will zoom in on details of setting depth correlation parameters.



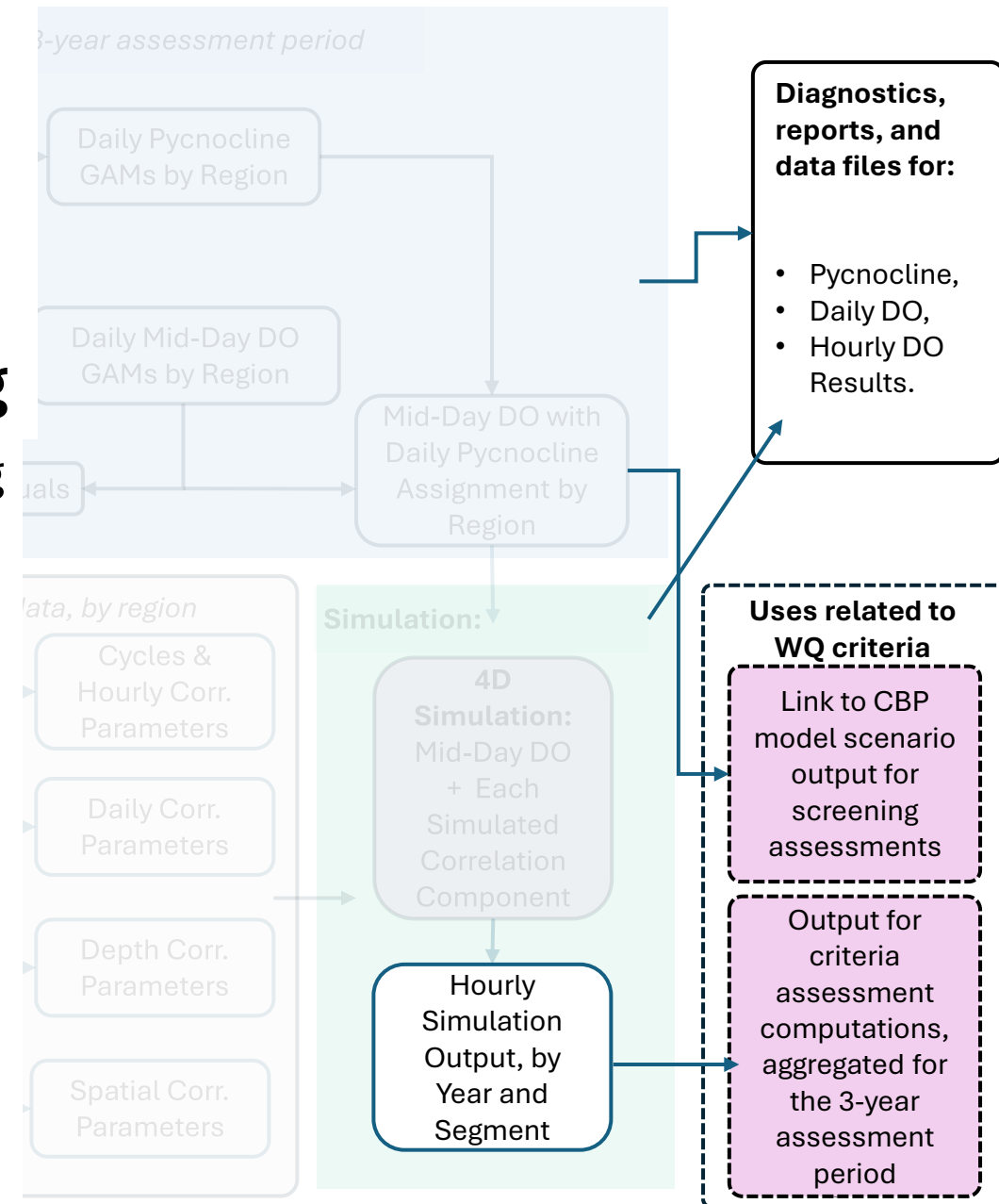
Recent work: Simulation testing

- Coding parameter structure so it can be annually updated,
- Testing optimal number of simulations.

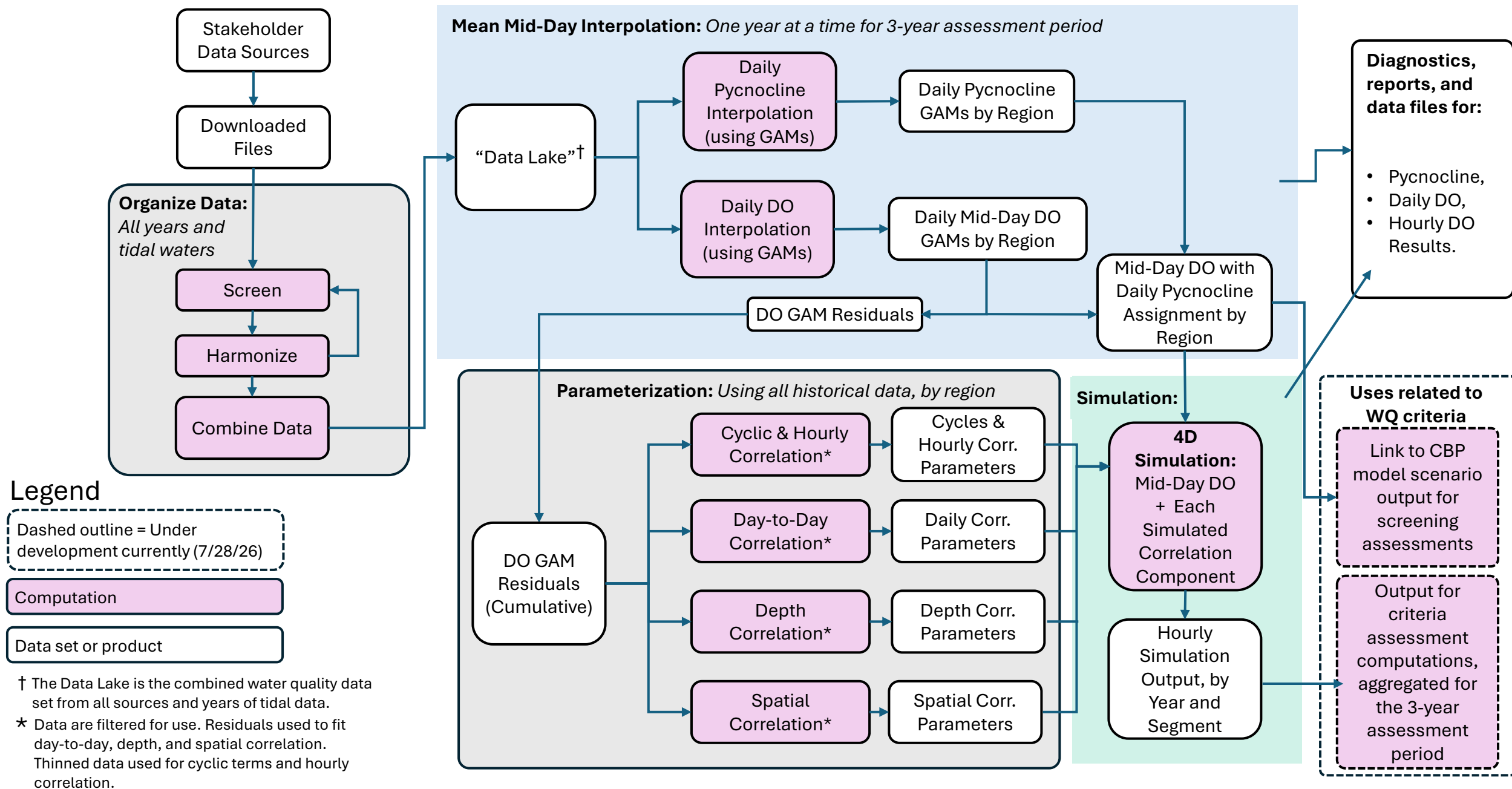


Next: Testing, linking, and documenting

- Examining DO interpolation diagnostics, summarizing findings, generating case study graphics.
- Coding CFD-related analyses and options.
 - Feedback from CAP on segments and years to focus initial evaluations will be helpful.
 - Conversation will continue for next few months on options and results.
- Writing documentation for stakeholder review and STAC review starting in November.



4-D Interpolator Workflow



extras

Previous diagram

- This one you've seen before was fairly conceptual.
- The new diagram follows the workflow with a bit more detail.
- We'll try to connect them.

