A Tutorial: Unstructured Grids Visualization with UXarray (with MPAS focus)

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UXarray, a scientific Python package as a result of the collaborative effort between Project Raijin -funded by an NSF EarthCube award- and the DOE SEATS Project, is an extensible and scalable software tool aimed at (1) recognizing several unstructured grid formats including MPAS, and (2) providing support for analysis and visualization functionality to be operated on the native unstructured grid model outputs used in the Earth System Sciences (without regridding to structured grids, and using the existing and generating new connectivity information as needed). UXarray extends Xarray and is built around the UGRID conventions. UXarray supports a variety of unstructured grid formats including UGRID, MPAS, SCRIP, ESMF connectivity, Exodus, and ICON (WIP), and is extendable for other formats.

This demonstration covers an introduction to unstructured grid workflows with UXarray, providing an overview of the visualization methods and libraries, and showcasing several UXarray visualization functions using sample MPAS datasets.