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Advancing Cloud-Native Data Analysis and Publishing with Pangeo Tools in EarthCODE

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EarthCODE (Earth Science Collaborative Open Development Environment) is a platform that leverages cloud-native tools to empower Earth system researchers in accessing, analyzing, and sharing data across distributed infrastructures, such as the Copernicus Data Space Ecosystem and Deep Earth System Data Laboratory (DeepESDL). By integrating Pangeo ecosystem tools—including Xarray, Dask, and Jupyter—EarthCODE supports scalable, FAIR-aligned workflows tailored to the challenges of Earth system science.

EarthCODE streamlines cloud-based data analysis and publishing by enabling collaborative research through interoperable workflows for analyzing complex datasets, including satellite observations, climate models, and in-situ measurements. Researchers can publish their analyses and workflows as reusable, executable resources in EarthCODE's science catalog, fostering alignment with open science principles.

Through its integration of Pangeo tools, EarthCODE offers an intuitive environment for reproducibility, scalability, and collaboration, bridging the gap between data analysis and actionable insights. This presentation will demonstrate EarthCODE's capabilities, including live, executable Jupyter notebooks that highlight its potential for sharing workflows and engaging diverse user groups. EarthCODE exemplifies the transformative power of cloud-native research, promoting open science and advancing the accessibility of Earth system data.