

Permafrost Discovery Gateway

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Project Website Urls & Social Media Accounts:

permafrost.arcticdata.io

Permafrost Discovery Gateway on Facebook

Project Objectives: We aim to empower the broader Arctic community with an online platform, the Permafrost Discovery Gateway (PDG) that will make big imagery permafrost products accessible and discoverable to enable knowledge-generation by researchers and also the public. This will include 1) developing and optimizing automated remote sensing workflows that includes machine and deep learning techniques, 2) producing big imagery products of permafrost across the Arctic, and 3) enabling discovery and knowledge-generation through visualization and analysis tools designed with input from users of the PDG. We are building upon existing remote sensing, visualization (Fluid Earth Viewer, for example), and cyberinfrastructure tools (Clowder and the Arctic Data Center) and are tapping into the Local Environmental Observers Network, which is an established virtual environment for co-production of knowledge. Training of the future workforce will include the participation of graduate students, and postdocs, while the K-12 education community will receive online teaching resources.

Keywords: Science gateway, big data, cyberinfrastructure, visualization, discovery

Progress To Date/Future Plans: The effort has centered on communication within the core-team, familiarizing team members with project components spanning modelling, visualization, machine learning, cyberinfrastructure and, from there, establishing a more detailed path of action/overall architecture to be implemented. The effort has thus far identified opportunities for workflow optimization in the big imagery remote sensing analyses and the project recently successfully gained access to a Leadership Resource Allocation at Texas Advanced Computing Center. We also listed existing geospatial data to ingest into the PDG and identified visualization tools to either bring in or to build upon.

Highlights or Expected Outcomes: The expected outcome will be a tool, accessible via a regular web browser that will enable science and informed decisions by making big imagery products discoverable, accessible and actionable.

NNA Community Collaboration and Research Coordination: The PDG can offer the NNA community a platform to access and explore big data from satellite imagery, while the NNA community can help make the PDG more effective by providing feedback on its content and design.

Advice for Overcoming NNA Project Challenges: PDG is a large and diverse team (~20 people, eight institutions) and as such bridging different expertise is key. We implemented bi-weekly Zoom meetings that center upon the technical, visualization, or outreach aspects of the project instead of having one large team meeting, aiming to identify the common architecture and team consensus for each aspect. As plans mature best practices with regards to development/deployment will additionally be employed across the team.

