



Access and Visualization of Spaceborne Altimetry Data from ICESat and ICESat-2

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OpenAltimetry (<http://openaltimetry.org/>) is an online tool that has been developed to provide altimetry-specific data discovery and access functionality that focuses on ease-of-use and quick response times, with appeal to both new and experts users. It supports NASA's laser altimeter missions: ICESat (2003-2009) and ICESat-2 (scheduled for launch in 2018) with a powerful, web based interactive interface that provides data discovery, processing and visualization capabilities targeting both novice and expert users across different science specializations. These altimetry data have previously only been available as a set of file-based hierarchical data products, sequential in time but not spatially organized, with key parameters often distributed between multiple data products. Non-expert users must therefore rely on data subsetting and delivery tools provided by the mission and/or archive centers, both of which are resource-limited and focused on a different user constituency. The publication record suggests that familiarity with satellite laser altimetry data remains low outside a narrow user group within the cryosphere community and we believe that the lack of an easy means of traversing the dataset and visualizing its primary observations represents a missed opportunity for recruiting interest among new users. More critically, current access methods available for ICESat (and for the upcoming ICESat-2) require a certain degree of familiarity with the data. OpenAltimetry provides altimetry-specific data discovery and access functionality that focuses on ease-of-use and quick response times. OpenAltimetry leverages expertise and experience gained in implementing and operating OpenTopography – a production-level service offered to Earth science users, funded by NSF (opentopography.org). That project demonstrated that online access to data and tools via easy-to-use interfaces can significantly increase data usage across a wide range of users, from students to academic researchers to those in the commercial sector. OpenAltimetry's interactive data discovery user interface design is custom built using the OpenLayers mapping library and modelled after NASA's popular EOSDIS Worldview application. For data management, we are using a hybrid solution with a highly optimized PostgreSQL database with tiered storage, and HDF5 to store and organize the waveform energy (for ICESat) and photon (for ICESat-2) data.