SensEarth – A Web-based Geoportal for Acquisition, Analysis, Mapping, and Modeling of Ice Accretion Observations

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The implementation and application of a standards-based, highly-interoperable, Web-based geoportal for continuous acquisition, analysis, mapping, and modeling of ice accretion and other environmental data is described. SensEarth is a geospatial portal (geoportal) system accessible from any device that supports an industry-standard Web browser. It provides the ability to discover and view sensors and sensor observations compliant with Open Geospatial Consortium (OGC) Sensor Web Enablement (SWE), IEEE-1451, and other internationally-recognized standards and specifications. While SensEarth can support practically any sensor-based application, this paper will demonstrate its use as a multi-purpose tool for continuous monitoring of available environmental observations over selected geographic areas (including very large regions), identifying and alerting users to actual or potential atmospheric icing conditions, and forecasting probabilistic ice and wind loads via integration with ice accretion models. Because SensEarth employs various geospatial, metadata, sensor, Internet and other standards in its design and implementation, it allows for integration of sensors, sensor observations, and derived data (e.g., probabilistic ice and wind loads) with other applications, including mass market tools such as Google Maps and Google Earth. It also allows for discovery and inclusion of additional sensors to enhance data coverage and quality via mobile devices or platforms of convenience that may be deployed in an area of interest.