The use of ALOS PALSAR in Global-Scale Mapping of Inundated Wetlands

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Wetlands exert major impacts on global biogeochemistry, hydrology, and biological diversity. The extent and seasonal, interannual, and decadal variation of inundated wetland area play key roles in ecosystem dynamics. Wetlands contribute approximately one fourth of the total methane annually emitted to the atmosphere and are identified as the primary contributor to interannual variations in the growth rate of atmospheric methane concentrations. Climate change is projected to have a pronounced effect on global wetlands through alterations in hydrologic regimes, with some changes already evident. Despite the importance of these environments in the global cycling of carbon and water and to current and future climate, the extent and dynamics of global wetlands remain poorly characterized and modeled, primarily because of the scarcity of suitable regional-to-global remote-sensing data for characterizing their distribution and dynamics.

We are utilizing ALOS PALSAR data sets for construction of a global-scale Earth System Data Record (ESDR) of inundated wetlands to facilitate investigations on the role of inundated wetlands in climate, biogeochemistry, hydrology, and biodiversity. PALSAR-based components of the ESDR consist of fine-resolution (100m) maps of wetland extent, vegetation type, and seasonal inundation dynamics for continental-scale areas covering globally-crucial wetland regions. PALSAR data sets are also being applied to assess and validate coarse-resolution inundated area fraction products derived from multiple satellite data sources such as AMSR-E and QuikSCAT. We review the application of PALSAR data for wetlands mapping as related to wetlands classification at fine-scale, and as a validation source for the coarse-resolution products. We review the status of the assembly of the data record, and its planned availability to the greater science community to support Earth science research.

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