

J01: Satellite Remote Sensing for Earth Science Applications

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Session Description

Satellite remote sensing enables monitoring of the solid Earth, the hydrosphere, oceans and atmosphere. Modern satellite missions achieve spatial resolutions as low as 25 cm and temporal resolutions of one day. This allows for studying Earth system processes with unprecedented spatio-temporal resolution. Contemporary sensors achieve sensitivity levels which rival airborne surveys. In addition, contemporary satellite missions equipped with diverse sensors enable data fusion and more integrated analyses. We invite contributions, which employ satellite remote sensing observations from MICROWAVE SENSORS: scatterometry, altimetry, Synthetic Aperture Radar (SAR) including interferometric, polarimetric, or tomographic; OPTICAL SENSORS: LiDAR, multispectral, thermal, radiometric; as well as GEOPHYSICAL SENSORS: gravity, magnetic. The focus lies on the application of such observations towards an improved understanding of the targeted Earth system and its changes over time. The session is intended to bring together scientists from any of the CGU and CSAFM sections and create a truly interdisciplinary exchange. Contributions, which demonstrate how observations from comparable (constellations) or complementary sensors can be fused and applied to understand multi-scale Earth system processes, are of particular relevance. Those applications range from land cover and forestry, oceanography and hydrology, including sea ice and glaciers, through natural hazard and environmental assessment to natural resources and engineering problems.

Primary Affiliation: Joint CGU/CSAFM

J02: Cold climate riparian areas

Conveners: Henry Wilson¹ and Aaron Glenn²

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Session Description

Riparian areas can act as important hotspots of biogeochemical cycling where high rates of chemical and biological reactivity alter both the amount and form of carbon, nitrogen, and phosphorus reaching adjacent fluvial ecosystems. For example, high moisture levels and organic carbon availability that characterize riparian soils can fuel microbial nitrogen transformation and greenhouse gas emissions (as N₂O) where nitrogen loading from cropland is present. Riparian areas may also act as islands of intact permanent vegetation in highly altered landscapes supporting unique microclimatic conditions. Through influence on stream geomorphology, groundwater hydrology and local microclimate, riparian vegetation influences in-stream biogeochemical cycling, rates of bank erosion and the temperature regime of stream habitats. In agricultural landscapes the importance of riparian functions to stream ecosystem condition is often amplified, but vegetation and historically accumulated nutrients in these landscape features may also act as a source of dissolved nutrients to snowmelt runoff. The goal of the session is to draw together an interdisciplinary group of presenters to share recent findings on ecological functioning of riparian areas in both natural and agricultural cold climate settings. In particular, contributions will be welcomed that focus on measurements and modelling of the riparian zone water balance, aqueous nutrient cycling, GHG fluxes, influence on channel geomorphology, and near or in-stream microclimate.

Primary Affiliation: Joint CGU/CSAFM

J03: Robotics in the earth and oceanographic sciences

Conveners: Claire Samson¹, and Murray Richardson²

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Session Description

This session focuses on robotic platforms such as unmanned air vehicles (UAVs), unmanned ground vehicles (UGVs) and remotely-operated underwater systems, and their applications in the earth and oceanographic sciences. The session will cover all aspects of these emerging technologies, from platform design to mission planning and data interpretation. Abstracts are invited that feature robotic systems of different types, equipped with various sensors (imaging systems, geophysical instruments, terramechanic sensors, etc.). Case histories on robotic missions are particularly welcome, including but not limited to, geological mapping, ecosystem monitoring, detection of unexploded ordnance, and surveying in toxic environments. The session aims at bringing together people from a wide range of scientific and engineering disciplines, from hazard management to soil sciences.

Primary Affiliation: Joint CGU/CSAFM

