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Potential synergies between HyspIRI / ECOSTRESS and EnMAP for Earth system applications

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ABSTRACT:

In 2007 the US National Research Council Earth Science Decadal Survey recommended launching the Hyperspectral Infrared Imager (HyspIRI). HyspIRI is a global mission designed to address a critical set of questions on how the surface of the earth and in particular ecosystems, are responding to natural and human-induced changes. The HyspIRI mission includes two instruments: a visible shortwave infrared (VSWIR) imaging spectrometer operating between 0.38 and 2.5 µm at a spatial scale of 60 m with a swath width of 145 km and a thermal infrared (TIR) multispectral scanner operating between 4 and 12 µm at a spatial scale of 60 m with a swath width of 600 km. The VSWIR and TIR instruments have revisit times of 19 and 5 days, respectively. The launch date for HyspIRI is in the 2024+ timeframe. As part of the risk reduction activities for the TIR instrument a space-ready prototype was developed in the laboratory referred to as the Prototype HyspIRI Thermal Infrared Radiometer (PHyTIR). In 2014 the Ecosystem Spaceborne Thermal Radiometer Experiment on Space Station (ECOSTRESS) was selected as part of the Earth Ventures Instrument program. ECOSTRESS will use PHyTIR to address critical questions on plant–water dynamics and future ecosystem changes with climate through an optimal combination of TIR measurements, with high spatiotemporal resolution (38 x 57 m; every few days at varying times of day), and spectral resolution (5 spectral bands) from the International Space Station (ISS). In order to address its core science questions ECOSTRESS will utilize high spatial resolution solar reflected data, including those provided by EnMAP, if available. This presentation will provide an overview of the HyspIRI and ECOSTRESS programs and explore the synergy between ECOSTRESS and EnMAP.