The International Space Station: New Capabilities for Disaster Response and Humanitarian Aid

William L. Stefanov, Jacobs/ESCG, International Space Station Program Science Office, NASA Johnson Space Center, Houston, TX 77058 USA; william.l.stefanov@nasa.gov

The International Space Station (ISS) has been acquiring Earth imagery since 2000, primarily in the form of astronaut photography using hand-held film and digital cameras. Recent additions of more sophisticated multispectral and hyperspectral sensor systems have expanded both the capabilities and relevance of the ISS to basic research, applied Earth science, and development of new sensor technologies. Funding opportunities established within NASA, the US National Laboratories and the international partner organizations have generated instrument proposals that will further enhance these capabilities. With both internal and external sensor location options, and the availability of both automated and human-tended operational environments, the ISS is a unique platform within the constellation of Earth-observing satellites currently in orbit.

Current progress and challenges associated with development of ISS terrestrial remote sensing capabilities in the area of disaster response and support of relief efforts will be presented. The ISS orbit allows for imaging of the Earth's surface at varying times of day and night, providing opportunities for data collection over approximately 95% of the populated regions. These opportunities are distinct from—yet augment—the data collection windows for the majority of sensors on polar-orbiting satellites. In addition to this potential for "being in the right place at the right time" to collect critical information on an evolving disaster, the presence of a human crew also allows for immediate recognition of an event from orbit, notification of relevant organizations on the ground, and re-tasking of available remote sensing resources to support humanitarian response and relief efforts.

Challenges to establishing an integrated response capability are both technical (coordination of sensor targeting and data collection, rapid downlink and posting of data to a central accessible hub, timely generation and distribution of relevant data products) and operational (notification and engagement of sensor support teams, international partner agency sanction of astronaut support activities). To better collaborate on common issues and strengthen applications, including using the data to support disaster response, we established an ISS Program Science Forum Working Group for Earth Observations comprised of representatives from the international partner agencies. This international forum welcomes input and support from relevant United Nations task groups regarding our disaster response and humanitarian aid to enable development of the ISS capabilities in this area for greatest value to the international community.