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Hyperspectral Sensing of the Coastal Zones:

Hyperspectral Imager for the Coastal Oceans (HICO), its Ancestors and Descendants

Presented by:

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Hyperspectral Sensing of the Coastal Zones: NRL's HICO, its Ancestors and Descendants

HICO is NRL's Hyperspectral Imager for the Coastal Ocean, the first spaceborne hyperspectral imaging (HSI) system designed to sample the coastal oceans. Sponsored by ONR as an Innovative Naval Prototype, NRL's Remote Sensing Division designed and built HICO in 18 months for about \$3 million to take advantage of a berth on the International Space Station (ISS), as sponsored by the Space Test Program. NRL built on a decade of experience working the end-to-end issues involved in remote sensing, creatively incorporating commercial off-the-shelf parts into airborne systems that they designed and built in-house. HICO

operated on-board the ISS from 2009-2015, acquiring 10,000 images, supporting naval needs and scientific investigations, and cementing NRL's leadership role in the field of coastal remote sensing. The NRL group is now working with the Canadian Space Agency to incorporate a similar HSI sensor into NASA's upcoming PACE mission. This presentation will describe NRL's hyperspectral remote sensing program, its role in addressing naval requirements and scientific inquiries, how HICO provided answers as well as lessons for improvements, and where this program is headed.

ABOUT

Dr. Mary Kappus

Dr. Kappus earned bachelor's degrees in Earth and Planetary Science and Civil Engineering from MIT in 1978, and a doctorate in Earth Science from UCSD in 1991. She served in the Navy Civil Engineer Corps, both on active duty and in the reserves, and retired as a Captain. After completing an NRC post-doctoral fellowship at NRL in marine geophysics in 1993, she got an opportunity to enter the new field of hyperspectral remote sensing. She worked on the multi-agency HYDICE project and NRL's home-grown PHILLS sensors. After a dozen years as a contractor working with intelligence agencies to integrate more technical

remote sensing techniques into their analysis, she returned to NRL as Branch Head for the Coastal and Ocean Remote Sensing Branch in 2012. There, she has continued to work on hyperspectral and multispectral imagery applications. She assumed leadership of the HICO program during its operational phase and guided its transition to NASA sponsorship. Currently, she is working with NASA and the Canadian Space Agency on a coastal hyperspectral sensor to complement the primary sensors on the PACE mission, which is scheduled for a 2022 launch.