

HICO Data Distribution at OSU

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- Developed HICO Public Website at OSU using published and approved for distribution data, publications and presentations.
 - Currently Password protected working with a test group of users
- Will include some example HICO data (e.g. Columbia River) that is approved for distribution.
- OSU HICO Web site will be portal for data requests and distribution
 - Data requests require proposal and data agreement signed by the requestor and their institution and approved by NRL.
- Example data and data requested by that user will be available to them.
- <http://hico.coas.oregonstate.edu/login/login.shtml>



- **Follow the approach used by the European Space Agency (ESA) for selecting and certifying international users for ERIS and other ESA data.**
 - **5 Pg. Data users proposal**
 - **Formal Data users Agreement**
 - **Distribute standard data products in standard formats from an FTP website (password protected)**
 - **Website at OSU to avoid any issues of international users accessing a NRL website.**
- **Directions on the HICO website; click on “Become an HICO Data User”**

Data Users Proposal Format



- **Abstract/project summary** (approximately 200 word overview of the project)
- **Statement of work/project description** Background, state of the field, what HICO data is requested and how is it useful to you. Describe study sites, in situ and other data, algorithms and proposed products and deliverables.
- **Biographical sketch and available facilities**
- **Output and deliverables** Assuming a successful outcome what are the products that will be produced (New products, validation of HICO products, etc.)? How will using HICO data advance the mission of your program?
- All HICO data users will be asked to attend an annual HICO team meeting to present their results and discuss HICO data and its uses and applications.
- **References**

[Proposal follows the general format used by ESA for Cat 1 investigator proposals. Total proposal should be less than 5 pages]

Essentially a copy of the ESA Data users Agreement. Required to be signed by all data users outside the NRL team.

Sections of the agreement:

- Definitions (HICO, ONR, NRL, etc)
- ONR and NRL Rights and Obligations
- HICO Data User PIs Rights and Obligations
- Intellectual Property Rights
- Miscellaneous
- **Signed by the PI and designated official that can commit the university or other organization.**

- The proposal and signed agreement should be mailed to:
Curtiss O. Davis, HICO Project Scientist
104 COAS Admin. Bldg.
Oregon State University
Corvallis, OR 97331 USA
- **Then Signed by NRL (Mike Corson) and copied back to OSU who is then authorized to distribute the data.**

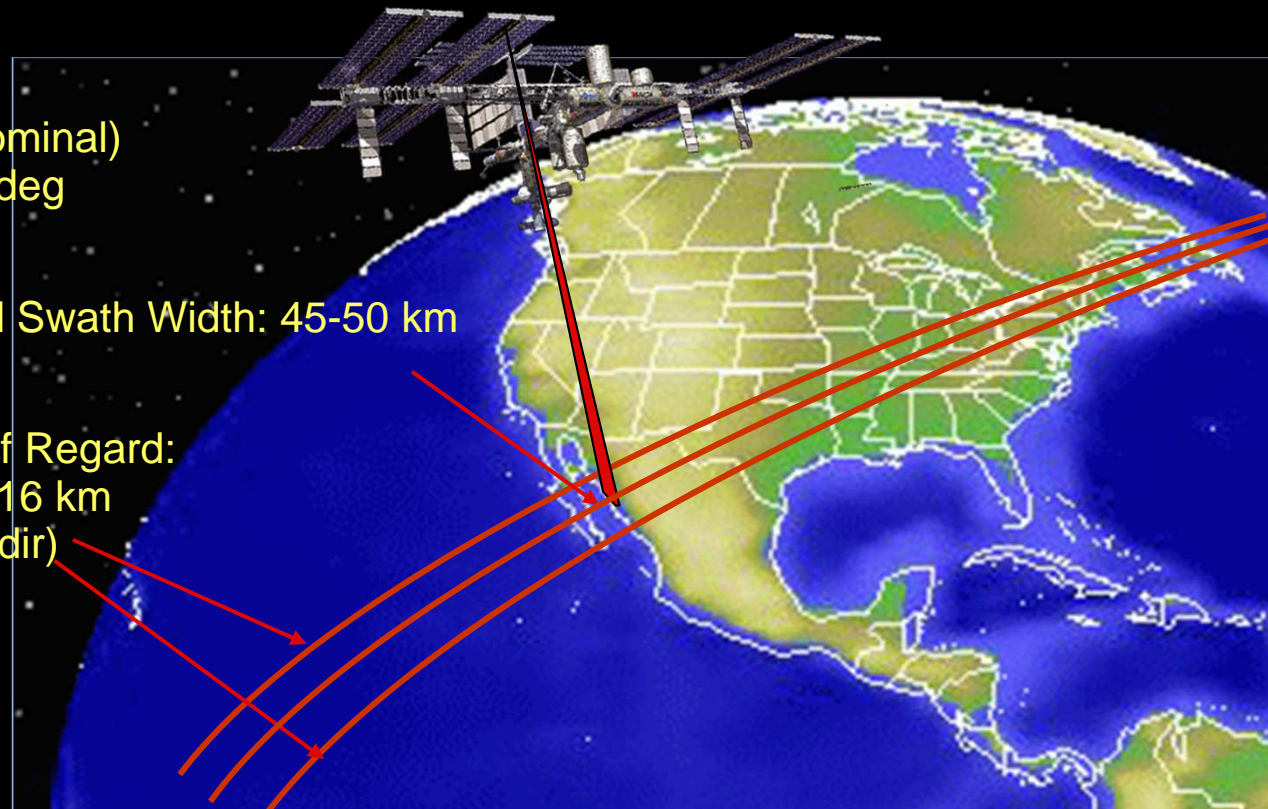
- Follow directions “**How to Request Data**” on the HICO website.
- Individuals will request data via their proposal
- Must also create and sign a HICO data agreement
- Data requests will be forwarded by OSU to NRL to be added to the HICO imaging queue.
- Request data for a specific location or locations
 - Provide a center latitude and longitude for the collection site.
 - If the site is larger than a single HICO scene may request a series of images to cover the entire area.
- Requests can include requesting a time series of data for change detection, seasonal or other studies.
- As an archive develops HICO data for standard sites (e.g. MOBY, AAOT, etc.) may be viewed by all HICO data users, who can then request existing scenes.
- Data requests are filled on a priority basis set by NRL and special effort will be made to collect data for field experiments, etc.

Image Coastal Ocean Zones
Along ISS Ground Track,
Swath 50 km x 200 km long

ISS Orbit
Altitude: 375 km (nominal)
Inclination: 51.6 deg

Ground Swath Width: 45-50 km

Cross-Track Field of Regard:
Left and Right 216 km
($\pm 30^\circ$ off-nadir)



Mechanics of Data Distribution



- Data will be distributed via the OSU HICO Website.
- Investigators will be given 7 day advance notice when we will attempt to collect data for their site.
- Once data is collected it is downlinked to NASA MSFC and forwarded to NRL.
- NRL processes the data and sends OSU a message to pull the data from a web site.
- OSU pulls the data and reviews it for quality, and if good notifies the investigator.
- The investigator pulls the data from an OSU website (password protected).
- We estimate it will take 1 to 2 days for the data to become available. Actual time depends on many factors including the Station operations and NASA schedules that we cannot control. We have a mandated 48 hour delay for all requested data.

- Standard Data Product Level 1b in ENVI format (useful for testing atmospheric correction and other algorithms)
- Standard data products (level 2 Products)
 - A set of products (chl, suspended sediments, CDOM, IOPs, etc.) based on simulated MODIS data created from the HICO data. HICO channels are summed to create simulated MODIS data at 100 m GSD then products are created by automated processing for MODIS data in APS.
 - A hyperspectral image cube of land and ocean remote sensing reflectances. The HICO image cube after atmospheric correction. In ENVI format
 - All products are geo-located and in HDF-5 format which can be read in standard software like SeaDAS and ENVI.
- Additional products on request
 - Will consider other special requests on case by case basis.

Partial list of International Scientists who have expressed interest in HICO Data

Arnold Dekker	Arnold.Dekker@csiro.au
Hiroshi Murakami	murakami.hiroshi.eo@jaxa.jp
Jim Gower	gowerj@dfo-mpo.gc.ca
Joji Ishizaka	ishizaka@net.nagasaki-u.ac.jp
Mark Dowell	mark.dowell@jrc.it
Mervin Lynch	M.Lynch@exchange.curtin.edu.au
Milton Kampel	milton@dsr.inpe.br
Nicolas Hoepffner	nicolas.hoepffner@jrc.it
Peter Fearn	p.fearn@curtin.edu.au
Peter Regner	Peter.Regner@esa.int
Roland Doerffer	doerffer@gkss.de
Samantha Lavender	S.Lavender@plymouth.ac.uk
Stewart Bernard	SBernard@csir.co.za
Vittorio Brando	vittorio.brand@csiro.au
Yu-Hwan Ahn	yhahn@kordi.re.kr

HICO Home

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- Meet the Team
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Become a HICO Data User

Datasets

- How to request data
- Subscribe
- Search data archive
- Data characteristics

Image Galleries

Current Projects

HICO Data Search

TIP: To select more than one item from a list, hold down the control or shift key while clicking.
Select the Help button below for details about the selection parameters.

Basic | **Advanced**

TARGET	LEVEL	DATA FORMAT
<ul style="list-style-type: none"> All AAOT Amazon_River_Mouth Ariake Bahamas Bahamas_2 Bahamas_Andros Bahamas_LSI Bahrain BATS 	<ul style="list-style-type: none"> All L1B L1BM 	<ul style="list-style-type: none"> ENVI Standard HDF-5
DATE RANGE		
<i>the default is the entire date range available</i>		
2009-09-27 to 2010-08-26 YYYY-MM-DD		
RESULTS FORMAT		
<input type="radio"/> images only <input type="radio"/> text only <input checked="" type="radio"/> text and images		
<input type="button" value="Submit"/> <input type="button" value="Reset"/> <input type="button" value="Help"/>		



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- Working with the data

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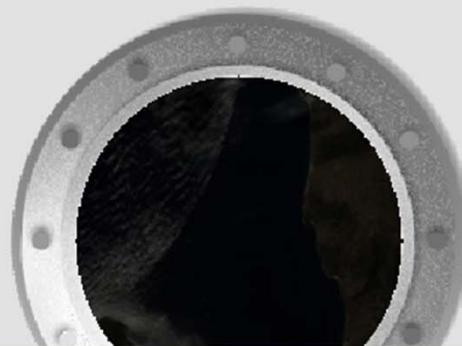
What is HICO?

The Hyperspectral Imager for the Coastal Ocean (HICO) is an imaging spectrometer based on the PHILLS airborne imaging spectrometers. HICO is the first spaceborne imaging spectrometer designed to sample the coastal ocean. HICO will sample selected coastal regions at 90 m with full spectral coverage (380 to 960 nm sampled at 5.7 nm) and a very high signal-to-noise ratio to resolve the complexity of the coastal ocean. HICO is sponsored by the [Office of Naval Research](#) as an Innovative Naval Prototype (INP), and will demonstrate coastal products including water clarity, bottom types, bathymetry and on-shore vegetation maps. As an INP, HICO also demonstrates innovative ways to reduce the cost and schedule of this space mission by adapting proven PHILLS aircraft imager architecture and using Commercial Off-The-Shelf (COTS) components where possible.

HICO Status

HICO is currently in the on-orbit calibration and data checkout phase.

The HICO program was initiated in February 2006. In January 2007 HICO was selected to fly on the Japanese Experiment Module Exposed Facility (JEM-EF) on the International Space Station. Construction began following the Critical Design Review on November 15, 2007. HICO was completed in July 2008 and it was integrated into the HICO and RAIDS Experimental Payload (HREP) in August 2008.



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Datasets

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HICO Data Search Results

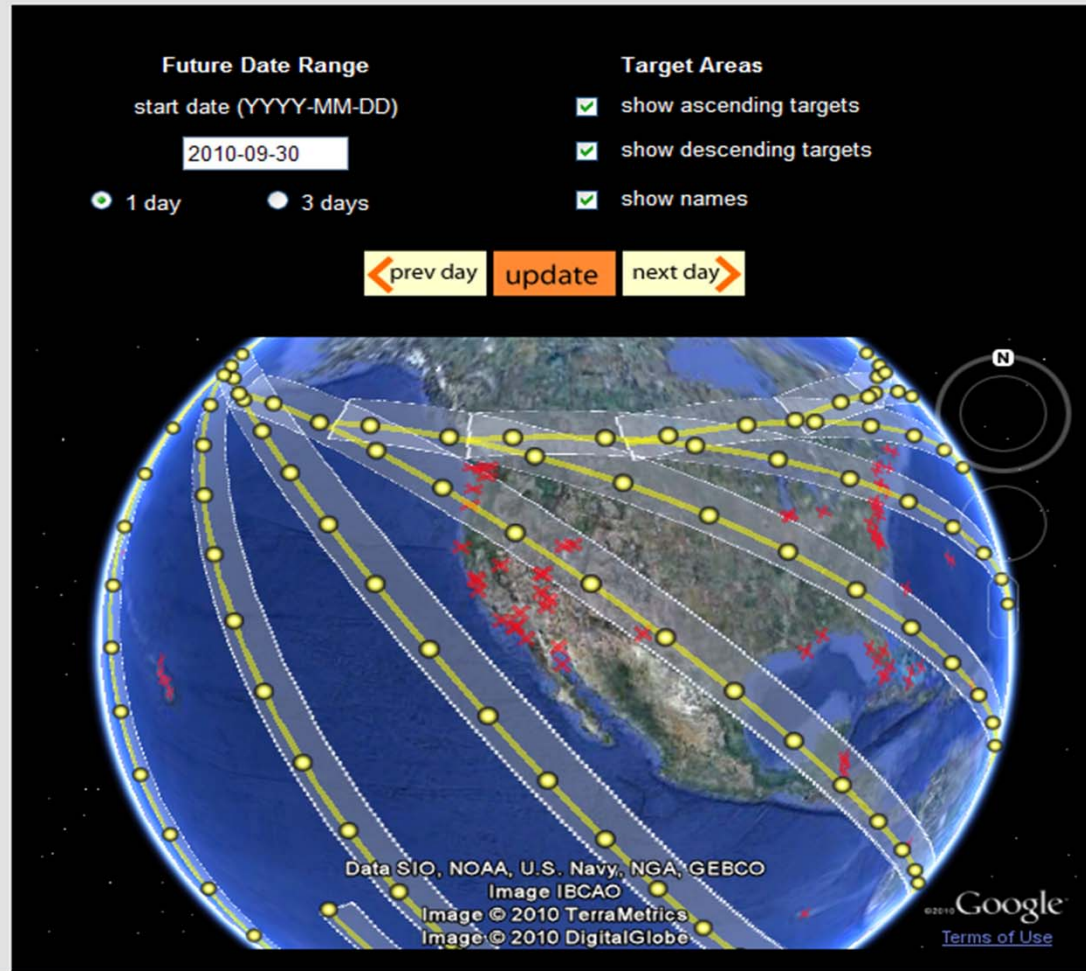
				
AAOT 2009-09-30 10:49:01 Scene ID : 1030 L1B full resolution image download	AAOT 2009-10-08 12:25:30 Scene ID : 1100 L1B full resolution image download	AAOT 2009-10-10 11:38:28 Scene ID : 1115 L1B full resolution image download	AAOT 2009-10-14 10:04:00 Scene ID : 1135 L1B full resolution image download	AAOT 2009-12-04 12:43:50 Scene ID : 1456 L1B full resolution image download
				
AAOT 2009-12-06 11:53:45 Scene ID : 1470 L1B full resolution image download	AAOT 2010-01-30 08:53:28 Scene ID : 1757 L1B full resolution image download	AAOT 2010-03-31 08:21:43 Scene ID : 2358 L1B full resolution image download	AAOT 2010-04-02 12:22:36 Scene ID : 2386 L1B full resolution image download	AAOT 2010-04-10 09:16:52 Scene ID : 2448 L1B full resolution image download

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ISS Orbit

ISS orbit predictions during local daylight (solar elevation above 15 degrees) are shown below ([Google Earth plugin](#) required). Note that *orbit prediction accuracy decreases considerably with time*. Please see below the figure for more information.



- We have tested it internally, but are looking to this group to pull data and test the system.
 - Give us your Feedback
- We are still refining the calibration and level 1B processing
 - Will likely do a t least 1 reprocessing later this year
- We are still working on atmospheric correction
 - We can use help and feedback, especially related to matching up with in situ data.
- Let us know when/if you have issues

NRL – DC

- Michael Corson, PI
- Robert Lucke, Lead Engineer
- Bo-Cai Gao
- Charles Bachmann
- Ellen Bennert
- Karen Patterson
- Dan Korwan
- Marcos Montes
- Robert Fusina
- Rong-Rong Li
- William Snyder

NRL – SSC

- Bob Arnone
- Rick Gould
- Paul Martinolich
- Will Hou
- David Lewis
- Ronnie Vaughn
- Adam Lawson
- Alan Weidemann
- Ruhul Amin

Academic

- Curt Davis, OSU, Project Scientist
- Jasmine Nahorniak, OSU
- Nick Tufillaro, OSU
- Curt Vandetta, OSU
- Ricardo Letelier, OSU
- Zhong-Ping Lee, MSU

Special thanks to our sponsors the Office of Naval Research, the Space Test Program, and to NASA and JAXA who made this program possible.



- Built and launched in 28 months
- Over 1700 scenes in first year
- Two more years of operations
- Data from OSU HICO website