

# **The Hyperspectral Imager for the Coastal Ocean (HICO): Policy for Data Distribution to University and International Collaborators**

## **Summary of HICO Data Distribution Policy**

The HICO Data Distribution Policy is to distribute HICO data freely to US agencies (e.g. NOAA and NASA) utilizing Distribution Statement D, and to academic and international researchers in response to an NRL approved HICO User's Proposal and the execution of a HICO Data User's Agreement. The data will be distributed via a public HICO website operated by Oregon State University managed by Dr. Curtiss Davis, the HICO Project Scientist. Dr. Michael Corson, the Naval Research Laboratory (NRL) HICO Project Principal Investigator, will have full review authority of the web site and all material posted on the site. Only data and information that is designated for unrestricted distribution will be sent from NRL to OSU for posting on the site. Using the OSU site alleviates the need for academic and foreign scientists to have access to an NRL website.

Scientists interested in receiving HICO data will complete a brief proposal describing the data they are requesting, the science they propose to undertake with those data, and the investigators' credentials and facilities for doing the work. They must also agree to provide all results to the HICO Project including copies of all publications and to attend an annual HICO Data Users meeting to present their results to the group. They will also sign a Data Users Agreement which defines the parties to the agreement and the rights and responsibilities of those parties.

This policy is deemed to be in the Navy's interest because it is practical to collect and process far more HICO data than what is needed for the core NRL Project and the Navy will benefit from its distribution. Distributing HICO data with the agreement that the data users will share all products, insights and algorithms with the HICO team greatly enhances the science produced and products demonstrated with HICO data. Also, this wide distribution will allow the larger ocean color community to evaluate HICO data first hand and provide advice that will greatly enhance the quality and credibility of the NRL HICO program.

HICO data are considered Distribution D: Distribution authorized to the Department of Defense and U.S. DoD contractors only (critical technology, March 2010). Other requests shall be referred to NRL HICO Program Office. Release of data from the HICO imager will be delayed 48 hours. Exceptions can be granted by the program office.

## **Background**

The Hyperspectral Imager for the Coastal Ocean (HICO; Corson et al. 2008) is an imaging spectrometer based on the PHILLS airborne imaging spectrometers (Davis et al. 2002). HICO is the first spaceborne imaging spectrometer designed to sample the coastal ocean. HICO will sample selected coastal regions at approximately 90 m Ground Sample Distance (GSD) with full spectral coverage (400 to 900 nm sampled at 5.7 nm), and signal-to-noise ratio sufficiently high 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 type of space mission by adapting proven PHILLS aircraft imager architecture and using Commercial Off-The-Shelf (COTS) components where possible.

The HICO project 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 was integrated into the HICO and RAIDS Experimental Payload (HREP) in August 2008. Environmental testing of HREP was completed at NRL and NASA's Marshall Space Flight Center. HREP was shipped to Japan on April 9, 2009. HREP was launched on the H-2 Transfer Vehicle (HTV) on September 10, 2009. The HTV rendezvoused with the ISS on September 17, 2009. The first HICO imagery was collected on September 25, 2009. The HREP mission is conducted with the support and direction of DOD's Space Test Program. HREP has also received support from NASA and JAXA as the first US experiment payload on the JEM-EF.

HICO data have much greater spatial (90 m vs. 1000 m) and spectral (87 channels vs. 9-15) resolution than current spaceborne ocean color imagers, and the data are of great interest for studying the dynamics of the coastal ocean. US agencies (e.g., NOAA, NASA) and scientists from academia (both nationally and internationally) have expressed interest in receiving and using HICO data to develop new algorithms and to study coastal ocean dynamics. Here we describe the plan for distribution of HICO data to the community and to provide information on HICO to the general public.

## HICO Data Characteristics and Classification

HICO was fully characterized in the NRL Remote Sensing Division Calibration Facility prior to launch. Key characteristics of the data are presented in **Table 1**. HICO is designed to image the coastal ocean and thus it has large area coverage, large GSD and very high SNR suitable for imaging this large but optically very dark environment. Laboratory measurements and initial on-orbit data indicate that they are excellent data for imaging the coastal ocean.

**Table 1. HICO requirements and as built values as measured in the calibration laboratory prior to launch. Table from Korwan, et al. (2009).**

Parameter	Requirement	As-built Value
Off-nadir pointing	45 deg port, 30 deg starboard	45 deg port, 30 deg starboard
Spectral Range	400 to 860 nm (goal 380 to 1000 nm)	350 to 1080 nm sampled (distributing 400 to 900 nm data)
Spectral Channel Width (normal mode)	10 nm (goal 5 nm)	5.73 nm
Spectral Channel Width (HR mode)	No requirement	1.91 nm
Signal to Noise Ratio	> 200 to 1 for a 5% surface albedo (10 nm spectral bins)	> 200 to 1 for a 5% surface albedo (11.46 nm spectral bins)
Polarization Sensitivity	< 5% (goal < 2%)	< 5% for most wavelengths
Nadir Crosstrack Ground Sample Distance	100 m @ 400 km alt.	94 meters @ 400 km alt.
Nadir Along-track Ground Sample Distance	100 meters	99 meters
Scene Size	(50 km wide)×(200 km long)	(42 km wide)×(192 km long) depending on altitude and angle
Vignetting	No vignetting	No vignetting
Saturation	Will not saturate when viewing 95% albedo cloud	Close to this value
Image quality	MTF > 0.35 at Nyquist spatial frequency of 0.5 cycles/pixel	PSF about 1 pixel
Spectral stray light	< 1% albedo error	Not strictly measured
Jitter	< 0.2 IFOV per frame	Space craft dependent
Long term stability	+/- 5% after calibration	On orbit measurement

While HICO data are high resolution compared to other ocean color sensors, they are very low resolution compared to sensors designed to image land or manmade features. For example, for land feature imaging, the Landsat sensor produces 30 m GSD data, SPOT produces 20 m, and

NASA's EO-1 ALI and Hyperion (hyperspectral imager) are both 30 m. For looking at manmade features there are a series of commercial satellites with 1-5 m GSD (e.g. GEOEYE-1 is 1.65 m multispectral data <http://www.satimagingcorp.com/satellite-sensors/geoeye-1.html> ).

HICO data are unclassified. This follows the US Air Force Classification Guideline for hyperspectral data which states that hyperspectral data are unclassified unless they have the spatial resolution to fully resolve military targets (examples given are tanks, camouflage, military vehicles). Under this guidance Hyperion 30 m hyperspectral data are unclassified and distributed freely through the U. S. Geological Survey website (<http://edcns17.cr.usgs.gov/NewEarthExplorer/>). By comparison, HICO data are 90 m data or one third the spatial resolution of Hyperion data.

As HICO data are unclassified and of moderate resolution, it will be acceptable to image US as well as international sites. By comparison, Landsat routinely images all of the United States at 30 m every 17 days and this is not considered an invasion of privacy. Landsat or higher resolution imagery is available for all of the US at Google Earth.

## Public HICO website at Oregon State University

Oregon State University (OSU) has long experience operating web sites and distributing MODIS ocean color data for NASA (e.g. <http://omel.coas.oregonstate.edu/MODIS/IPOPP/> ). Building on that experience, OSU has developed a website for HICO at <http://hico.coas.oregonstate.edu> (Fig. 1). The site is designed to provide all the background information and links to publications to allow scientists to learn what HICO is, what the data are like, and how the data are calibrated and processed. If they are interested in acquiring HICO data, there is a link where they can download the HICO data user's proposal and data user's agreement forms that they can fill out to apply to get data. Once approved as a user, they will have access to the password-protected data.



The image shows a screenshot of a web browser displaying the home page of the OSU HICO website. The browser's address bar shows the URL [hico.coas.oregonstate.edu/index.shtml](http://hico.coas.oregonstate.edu/index.shtml). The page features a large banner at the top with the text "OSU Oregon State University" on the left, a central image of the HICO instrument, and the large stylized text "HICO™" in orange. Below this, it reads "Hyperspectral Imager for the Coastal Ocean". To the right of the banner are several logos, including the Department of the Navy, Office of Naval Research, and OSU. The main content area is divided into sections: "HICO Home" with a list of links (Design & Heritage, Calibration, Targets, Orbit, Meet the Team, Publications & Presentations, Contact Us), "Log In" with a link to "Become a HICO Data User", and "Search Data" with links for "Data characteristics", "Working with the data", "How to request data", and "Subscribe (Log In req.)". The central text area is titled "What is HICO?" and contains a detailed paragraph about the instrument's capabilities and mission. Below this text is a circular inset image showing a satellite view of a coastal region. To the right, a section titled "HICO Status" provides a timeline of the program's development from 2006 to 2007.

Figure 1. Home page for the OSU HICO website. The website opened to the public on March 15, 2011.

## **HICO Data User's Proposal and Data User's Agreement**

HICO will adopt the approach used by the European Space Agency (ESA) for selecting and certifying international users for MERIS and other ESA data (<http://eopi.esa.int/esa/esa?cmd=aodetail&aoname=Registration>). This approach has worked well for ESA; most scientists interested in HICO data have proposed to ESA in the past and are familiar with this procedure.

The individual interested in getting HICO data will be asked to write a Data User's proposal and complete and sign a formal Data User's Agreement.

The Data Request Proposal (Appendix A) is less than 5 pages and includes:

- Abstract/project summary (approximately 200 word overview of the project)
- Statement of work/project description, background, state of the field, what HICO data are requested and how the data are useful to the proposer. 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 the 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

The data user's agreement (Appendix B) has the following sections:

- Definitions (HICO, ONR, NRL, etc)
- ONR and NRL Rights and Obligations
- HICO Data User PI's Rights and Obligations
- Intellectual Property Rights
- Miscellaneous

Both the proposal and the data user's agreement must be signed by the Principal Investigator and a designated official that can commit the university or other organization. The signed documents will be submitted to OSU where they will be checked for completeness and then sent on to NRL for approval. If NRL agrees, the documents are signed by NRL (HICO Principal Investigator or his designated official). Copies of the signed documents will be sent to NRL SSC (Bob Arnone or designee) and OSU (Curtiss Davis or designee) so that they know they can distribute the data. Approval of a data user proposal does not imply Navy S&T financial support.

Once approved as a data user, the investigator will have access to HICO data from the HICO website for their region of interest. The data are in the form of standard data products in standard formats. Subscriptions can also be set up to push the data to the user's FTP site. The website is hosted at OSU to avoid any issues of international users accessing an NRL website.

The proposal and signed data user's agreement may be submitted either by e-mail or regular mail. In the case of e-mail, the documents should be in PDF, containing either scanned copies of the signatures or electronic signatures.

Electronic submissions should be sent to:

Curtiss Davis  
[cdavis@coas.oregonstate.edu](mailto:cdavis@coas.oregonstate.edu)

Mailed submissions should be sent to:

Curtiss O. Davis  
HICO Project Scientist  
104 COAS Admin. Bldg.  
Oregon State University  
Corvallis, OR 97331  
USA

## **Data Distribution and Reporting**

Individuals will request data via their proposal and HICO data agreement which are submitted to OSU. The data request is reviewed by OSU for completeness and then forwarded to NRL DC for approval. Once approved, NRL SSC and OSU are notified. Then the specific data request(s) will be forwarded by OSU to NRL to be added to the HICO imaging queue.

Data can be requested for a specific location or locations by providing a center latitude and longitude for the collection site. If the site is larger than a single HICO scene the user may request a series of images to cover the entire area. Requests can include requesting a time series of data for time of day variations, change detection, seasonal or other studies. As an archive develops, HICO data for standard sites (e.g. MOBY, Chesapeake Bay, etc.) may also become available to all HICO data users.

Scene collection requests are filled on a priority basis set by NRL and special effort will be made to collect data for field experiments, etc. Data will be distributed via the OSU HICO website.

Investigators will be given 7 days advance notice when their data request is scheduled. Data are downlinked from the ISS to NASA Marshall Space Flight Center and forwarded to NRL DC. There the data are processed for calibration and geolocation and then sent to the Oceanography Division at NRL Stennis Space Center. Data requested by OSU or other academic or international users are then sent from NRL SSC to OSU for distribution. The investigator may either download the password-protected data from the website or automatically receive the data via subscription.

Public release of data from the HICO imager will be delayed 48 hours. It is estimated that it will take 3 to 4 days for the data transmission from the spacecraft, processing, transfer and posting to be completed. Actual time depends on many factors including ISS operations and NASA schedules that Navy cannot control. The products currently available are the HICO calibrated image cube (useful for testing atmospheric correction and other algorithms). These ENVI-format level 1b data files contain calibrated radiances from 400 – 900 nm.

On special request, a set of standard level 2 data products may also be provided:

- A set of products (chlorophyll, suspended sediments, colored dissolved organic matter, inherent optical properties, etc.) based on simulated MODIS data created from the HICO data. HICO channels are summed to create simulated MODIS data at 90 m GSD, then products are created by the automated processing routines for MODIS data in APS.
- A hyperspectral image cube of land and ocean remote sensing reflectances. This is the HICO image cube after atmospheric correction.
- Other special requests will be considered on a case-by-case basis.

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## **Appendix A. Proposal Format**

### **HICO Data User's Proposal**

#### **Title of Proposal**

#### **Principal Investigator**

Name

Address

Address line 2

Address Line 3

Address Line 4

Phone including country code

FAX including country code

e-mail address

Co Investigators: Full name, Institution and e-mail for each

#### **Signatures**

PI signature and date

Designated official signature, date, name and title

(a representative that can commit the university or other organization)

## Abstract/project summary

Provide a brief (approximately 200 words) overview of the proposed work and the expected outcomes from that work.

### 1. Statement of work/project description

Provide a clear statement of goals and their importance; a statement of work; and a brief background (including references as appropriate) to the proposed work. Included the current state of the art and background for work at your study site or region. Describe the proposed use of HICO data including what data are needed and the latitude and longitude of the proposed study site(s). Describe the advantages of using HICO data for your work and how having HICO data or products could advance your science and understanding of your study site.

### 2. Biographical sketch and available facilities

Give a brief background on the principal investigator including relevant experience in ocean color remote sensing. Describe the available facilities that will be used for the work outlined in the proposal. Include a description of any in situ or other ancillary data sets that will be used in this work including the quality and reliability of that data and access to the data.

### 3. Output and deliverables

Assuming a successful outcome, what are the products that will be produced? How will using HICO data advance the mission of the program? What will the investigator return to the HICO program (algorithms for new products, validation of HICO products for an additional site or region, etc.)? All HICO data users will be asked to attend an annual HICO team meeting to present their results and discuss HICO data and their uses and applications. One deliverable is the commitment to attend this annual meeting.

### 4. References

List any references cited in the proposal. Use a standard format such as in the example below.

Gao, B.-C., M. J. Montes, Z. Ahmad, and C. O. Davis, "An atmospheric correction algorithm for hyperspectral remote sensing of ocean color from space," *Appl. Opt.* 39(6): 887-896 (2000).

**[Total proposal should be less than 5 pages]**

## **Appendix B. Data User's Agreement**

**HICO Data User Agreement**  
Between the  
**Naval Research Laboratory**  
And  
The HICO Data User Principal Investigator

Issued on:

**Principal Investigator**

Address

Address line 2

Address Line 3

Address Line 4

Phone including country code

FAX including country code

e-mail address

**Signatures**

PI signature and date

Designated official signature, date, name, and title

(a representative that can commit the university or other organization)

Note that approval of a data user proposal does not imply Navy S&T financial support.

## 1. Definitions

HICO - Hyperspectral Imager for the Coastal Ocean. An Imaging spectrometer built by the U. S. Naval Research Laboratory and flown on the International Space Station to acquire imagery of selected coastal regions around the World.

HICO data - Data collected with HICO, downlinked by NASA and sent to the Naval Research Laboratory for processing. NRL will distribute level 1B (calibrated at sensor radiances) products as requested by the user. Data are distributed to university and International users via a web-based data portal operated by OSU.

HICO Data PI - The HICO data PI is the duly empowered representative of the entity having proposed the project and who has responsibility over the use of data in the framework of the Project.

ISS - The International Space Station which is operated by the National Aeronautics and Space Administration.

NASA - National Aeronautics and Space Administration who operates the ISS and controls all commands to and data transmissions from HICO.

NRL - The U.S. Naval Research Laboratory, the corporate research laboratory for ONR, which built HICO and which receives, processes and retains ownership of HICO data.

ONR - the U.S. Office of Naval Research who is the sponsor of the HICO program.

OSU - Oregon State University who will act as the portal for distribution of HICO data to the outside user community including all HICO Data Users selected in this program.

Project - The proposed and ONR/NRL Approved project for which the HICO data are used and this document is signed.

## 2. ONR and NRL Rights and Obligations

- 2.1. NRL, using OSU as a portal, provides the agreed amount and type of data to the HICO Data PI.
- 2.2. As directed by NRL, OSU delivers the requested data sets to the HICO Data PI via a web interface. NRL reserves the right to decide on the most appropriate timing and order of data delivery.
- 2.3. NRL, while duly considering the interests of the HICO Data PI, reserves the right to review, modify, suspend or terminate delivery of data at any time during the Project in the event that:
  - a) Funding of HICO operations or of the NRL, OSU or associated processing facilities operations cannot be sustained.
  - b) Satellite or related ground system failure occurs.
  - c) Planned HICO data collection is suspended or cancelled in order to accommodate ISS activities or carry out special activities that ONR or NRL consider of higher priority.
  - d) Status check of HICO and related systems or performance evaluation is needed. ONR and NRL may modify their mission operation plan(s) at any time, should they consider corrective action necessary for ensuring mission success.
- 2.4. The HICO Data PI agrees to modify, suspend or terminate the utilization of HICO Data for the Project when so requested by NRL. The HICO Data PI shall have no right whatsoever to claim for compensation or damage as a consequence of NRL's decision to terminate or suspend the delivery of HICO data.

- 2.5. ONR, NRL and OSU do not guarantee the suitability of HICO data for the purpose of the Project, and shall not be held liable for any damage derived from the use of such data by the HICO Data PI or any third party.
- 2.6. NRL will observe confidentiality markings on reports and other documentation submitted by the HICO Data PI only to the extent mutually agreed in writing in advance of the submission of such reports and documentation.
- 2.7. The Government of the United States as represented by NRL shall have a world-wide, irrevocable, royalty free, non-exclusive license to use, reproduce, and disseminate the results of the HICO project unless otherwise agreed to in writing by NRL.

### 3. HICO Data User PI's Rights and Obligations

#### *General Conditions of Data Utilization*

- 3.1. The HICO Data PI acknowledges the full title and ownership, including all derived rights, by NRL of all HICO data.
- 3.2. The HICO Data PI acknowledges and takes account of scheduling and processing constraints both at satellite and ground segment level.
- 3.3. The HICO Data PI understands that acceptance of these Terms & Conditions includes general acceptance of the related ONR/NRL Data Policies.
- 3.4. The HICO Data PI assumes full responsibility for the approved utilization of data, including utilization with co-investigators, for the duration of the Project.
- 3.5. The HICO Data PI is authorized to undertake duplication of data and data sets as necessary for the performance of the Project, without any charge to ONR, NRL or OSU.
- 3.6. The HICO Data PI provides NRL with a detailed list of all co-investigators. The HICO Data PI and all authorized co-investigators shall observe the following conditions of use:
  - a) Use all HICO data received exclusively for purposes of the Project.
  - b) Not disclose any information on in-orbit operation or satellite performance without prior written approval by NRL.
  - c) Indemnify ONR, NRL and OSU for the full amount of any loss, expense, cost or liability resulting from any utilization of data, for which ONR, NRL or OSU might be held responsible for any reason whatsoever.
  - d) Inform NRL without delay should, for any reason, the content or scope of the Project change after signature of this document.
  - e) Not assign any rights, obligations or interests herein without the prior written approval by NRL.
- 3.7. The HICO Data PI ensures that the supplied HICO data shall not be copied, transferred or otherwise be made available to third parties without the written consent of NRL.
- 3.8. Data utilization beyond the duration of the Project is not permitted. At the submission of the final report or date at which it is due, or any early Project termination, the HICO Data PI reports to ONR/NRL on his choice of one of the following options, to be implemented with immediate effect:
  - a) Return to NRL all original data provided.
  - b) Destroy all original data provided.
  - c) Keep all original data provided under custody for possible further utilization to be approved by NRL.

- 3.9. In the cases described under 2.3, the HICO Data PI has no right whatsoever to claim for compensation or damage as a consequence of the decision of ONR/NRL.
- 3.10. The HICO Data PI agrees to modify, suspend or terminate the utilization of HICO data when so requested by NRL.
- 3.11. The HICO Data PI waives any claim against ONR, NRL or OSU in the event of any damage directly or indirectly arising from malfunction or interruption in the transmission of data for any reason whatsoever.

#### *Cost of Data and Project Costs*

- 3.12. The HICO data will be delivered in an international standard data format (HDF-5 or ENVI image cube) via a web interface to the HICO Data PI. There is no charge for the HICO data, but the HICO Data PI is responsible for all costs associated with his ability to connect to the web and receive and store the data.
- 3.13. Costs of equipment to receive, read, process and analyze HICO data or any other costs associated with the execution of the Project will be borne and / or secured by the HICO Data PI.
- 3.14. At the request of NRL, the HICO Data PI provides evidence that he has and expects to have the necessary financial resources to carry out the utilization of data for the whole Project period.

#### *Reporting and Publication*

- 3.15. The HICO Data PI informs NRL in case of problems with data reception or data quality.
- 3.16. The HICO Data PI submits an **annual progress report**, giving the current Project status and providing samples of processed data sets and / or derived information.
- 3.17. Submission of progress reports is done either directly to NRL or via presentations to HICO workshops or conferences (duly recorded in the proceedings) or via delivery to NRL of a copy of publication(s) in scientific journals.
- 3.18. The HICO Data PI submits electronically a **final report** at the actual end of the Project period, in accordance with a given format as defined by NRL and summarized as follows:
  - a) Project objectives and detailed experiment description.
  - b) Integration of HICO data and contribution to development/improvement of models.
  - c) Assessment of the quality of HICO data and its adequacy to meet experiment requirements.
  - d) Comparison/synergy of HICO data with other data.
  - e) Results of the experiment, including the contribution of HICO data thereto.
  - f) Overall assessment of project outcome, divergence if any, from original objectives
  - g) Recommendations for improvement (e.g. data products, mission operations, new missions).
- 3.19. The HICO Data PI shall offer for publication results of the Project in peer-reviewed publications of international renown. The HICO Data PI shall present results at dedicated workshops organized by NRL, subject to HICO Data PI availability and resources. For a period of six months after Project completion, the HICO Data PI has the exclusive right to publish the results; thereafter, NRL reserves the right to publish the Project results, unless the HICO Data PI submits a request in writing to NRL stating the reasons why the

results should not be published and NRL agrees. NRL and the HICO Data PI agree to confer and consult to provide a reasonable review period prior to the publication or presentation of the results to assure that no confidential or proprietary Data is released and that patent rights are protected. Publication and /or presentation will be delayed for a reasonable time to afford needed protection.

- 3.20. Any publication whatsoever resulting from work carried out using HICO data shall contain the following attribution: "HICO™ Data provided by the Naval Research Laboratory." The HICO Data PI agrees to provide NRL with a copy of any publication at no cost to NRL. NRL shall have a royalty free right of to reproduce and disseminate these publications to the extent that such reproduction and dissemination do not conflict with the rights of third parties.

#### 4. Intellectual Property Rights

- 4.1. The HICO Data PI shall clearly mark all HICO data and analyzed information, irrespective of the form in which it is produced as follows: "HICO™ Data provided by the Naval Research Laboratory." Any copyright marking made by the HICO Data PI shall include notice that the Copyright claimed is exclusive of U. S. Government HICO Data.
- 4.2. The HICO Data PI shall use the following trademark on all HICO data and analyzed information: HICO™
- 4.3. The HICO Data PI shall respect of NRL's intellectual property rights and report any evidence of use contrary to the HICO Data agreement, including such of third parties, and agrees to notify NRL of any such known misuse in writing.
- 4.4. NRL retains title to all HICO data. The HICO Data PI may claim copyright in any HICO Data PI publications that may arise as a result of the latter's own interpretation of HICO processed data, and inputs of data or knowledge from other sources.
- 4.5. In case of emergence of their own intellectual property rights from direct utilization of HICO data, the HICO Data PI grants NRL, free of charge, an irrevocable and non-exclusive license to use such intellectual property in the field of space research and technology.
- 4.6. The HICO Data PI shall notify NRL in writing of any invention disclosures related to the HICO Data PI project within two months from the submission of the invention disclosure from the inventor(s) to the inventor's employers. NRL agrees to treat as confidential any such invention disclosure for a period of time sufficient to assure that no confidential or proprietary Data is released and that patent rights are protected.

#### 5. Miscellaneous

As was done with data from SeaWiFS and other ocean color sensors, the HICO project anticipates reprocessing the HICO data at various intervals as we gain a better understanding of the on-orbit performance and calibration of HICO. The HICO project will make every effort to include feedback and suggestions from the HICO Data PIs when planning data reprocessing. The HICO project will inform the Data PIs when reprocessed data is available and on request will provide the reprocessed data to the Data PIs. It is essential to use the latest and most accurate data. To assure they are using the

latest version the HICO project requests that the Data PIs specify the version of data used in their publications and that they check with the HICO Project office prior to submitting any publications to confirm that they have used the correct version of the data.

## Literature Cited

Corson, M. R., D. R. Korwan, R. L. Lucke, W. A. Snyder and C. O. Davis, 2008, "The Hyperspectral Imager For The Coastal Ocean (HICO) On The International Space Station," IEEE Proceedings of the International Geoscience and Remote Sensing Symposium, 978-1-4244-2808-3/08.

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