HyspIRI Products Symposium on HyspIRI Products for Societal Benefit Areas (SBAs) and Aquatic Studies

NASA/GSFC, May 29 and 30, 2013
Building 34, Conference room W150

Wireless internet connection:
**Choose "guest" network**

GSFC EO-1/HyspIRI Team

Betsy Middleton, NASA
Steve Ungar, UMBC

Petya Campbell, UMBC
Kevin Turpie, UMBC
Lisa Henderson, Sigma Space

David Landis, Sigma Space
Larry Corp, Sigma Space
Lawrence Ong, SSAI
Dan Mandl, NASA
Pat Cappelaere, Vightel Corp
Fred Huemmrich, UMBC
Ben Cheng, ERT
Qingyuan Zhang, USRA

Wed/Thurs Lunches: Pay at Registration Desk
Wednesday Dinner: Sign up
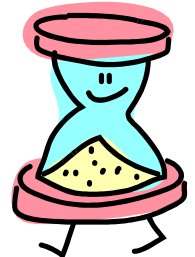
HyspIRI Symposium Goals

The Symposium's sessions are closely aligned with NASA's Applied Sciences program elements and the Earth Science Technology priorities:

1. Ecological Forecasting and Public Health, including Terrestrial and Coastal/Inland Aquatic Ecosystems;

2. Disasters/Natural Hazards and Water Management; and

3. Automated, Rapid Processing for Low Latency Data Products.

We will review recent accomplishments in these areas and identify the primary data products compatible with the technology to be provided by HyspIRI.

DAY 1 (May 29): Morning Agenda

8:00 Registration/ Posters Up in Room W120B/ Coffee

8:30 Symposium Opening, Goals and Agenda, W150 [*Chair: Elizabeth Middleton NASA/GSFC*]

    8:40 Current status of HyspIRI mission [*Woody Turner, NASA/HQ Co-Program Scientist*]

    8:55 The NASA Applied Sciences Program and the US Group on Earth Observations SBAs:
        Earth Sciences Serving Society [*Lawrence Friedl, NASA/HQ Associate Director for Applied Sciences*]

    9:10 Aircraft campaign – status update, sites, and flight plans [*Woody Turner*]

    9:25 Instruments concept (IC-1): introducing VSWIR & TIR instruments on separate platforms
        [*Rob Green & Simon Hook, NASA/JPL*]

9:35 - 10:00 Coffee Break

10:00 Ecological Forecasting for Terrestrial and Aquatic Ecosystems, W150 [*Chair: Susan Ustin, UC Davis*]

    10:00 Improving ecological forecasting with hyperspectral data: A data assimilation system for the
        Community Land Model [*Andrew Fox, NEON*]

    10:20 Evapotranspiration estimation with simulated HyspIRI data over arid lands [*Andrew French, USDA*]

    10:40 HyspIRI data products for plant functional types [*Susan Ustin, UCD*]

    11:00 Determining leaf dry matter content using the normalized dry matter index and its possible application
        for estimating fuel moisture content [*Raymond Hunt, USDA*]

    11:20 Data fusion techniques for mapping daily water use at field scales [*Martha Anderson, USDA*]

    11:40 The Matsu System for Rapid Analysis of Large Volumes of Data [*Bob Grossman, U Chicago*]

12:00 – 13:00 Lunch

DAY 1 (May 29): Afternoon Agenda #1

12:20 *Aquatic Data Products Breakout, W150*

    12:20 Angular dependence on sand density of the spectral BRDF [*Bill Philpot, Cornell*]

    12:40 Photosynthetic condition of giant Kelp (*Macrocystis pyrifera*) in the Santa Barbara Channel

        [*Thomas Bell, UC St. Barbara*]

13:00 Coastal & Inland Aquatic Data Products Topical Areas, W150 [*Chair: Kevin Turpie, UMBC*]

    13:00 Coral reef products for HyspIRI [*Eric Hochberg, BIOS*]

    13:20 Use of HyspIRI Observations to get Phytoplankton Functional Groups [*John Moisan, NASA/WFF*]

    13:40 Improved Absorption and Taxonomic Composition Estimates with HyspIRI

        [*Tiffany Moisan, NASA/WFF*]

    14:00 Impacts of Spatial and Spectral Resolution on Hyperspectral Remote Sensing of Aquatic Vegetation
        [*Richard Zimmerman, Old Dominion University*]

    14:20 Using hyperspectral airborne PRISM imagery to map vulnerable coastal salt marsh and sea grass
        habitats [*Heidi Dierssen, University of Connecticut*]

    14:40 Hyperspectral Imager for Coastal Ocean (HICO) [*Bo-Cai Gao, Naval Research Lab*]

15:00 – 15:20 Coffee Break

15:20 Special Topics 1, W150 [*Chair: Stephen Ungar NASA/GSFC*]

    15:20 HyspIRI Aircraft campaign: science goals, project overviews & data sharing

        [*Rob Green & Simon Hook*]

    15:35 Initial science results of the NASA/MAGI airborne instrument at the Salton Sea, CA: implications for
        environmental studies using HyspIRI data [*David Tratt, Aerospace Corp.*]

DAY 1 (May 29): Afternoon Agenda #2

15:50 Parallel Discussion Sessions: Charge, Goals and Anticipated Outcome [*Elizabeth Middleton*]

W150 Coastal/inland aquatic products: issues, products & requirements [*Kevin Turpie*]

 16:00 Aquatic studies with HyspIRI preparatory airborne campaign [*Sherry Palacios, UC Santa Cruz*]

 16:20 HyspIRI aquatic data products report [*Kevin Turpie, UMBC*]

  1. HyspIRI's potential contributions to wetland studies [*Kevin Turpie, UMBC*]

  2. Potential applications of HyspIRI for land/water/ice Geomorphology. [*Young-Heon Jo University of Deleware*]

  3. Detecting and quantifying water surface features using hyperspectral remote sensing: Strengths and limitations of HyspIRI [*Chuanmin Hu, University of South Florida*]

  4. Water-column retrievals [*Emmanuel Devred, Université Laval*]

  5. Bathymetry from hyperspectral remote sensing [*ZhongPing Lee, University of Massachusetts Boston*]

  6. Benthic data products [*Eric Hochberg, BIOS*]

 17:00 Aquatic data products discussion [Chair: *Kevin Turpie, UMBC*]

  1. Discussion on candidate suite of data products

  2. Availability of data for product development (HICO, air campaign data, ISS HICO follow-on / HyspIRI concept instrument)

  3. Seed questions regarding data product generation

  4. Potential issues regarding data product generation

   • *Atmospheric correction techniques: are further developments required for HyspIRI aquatic data products? (e.g., NO2)*

   • *Spatial resolution changes from 60m to 1km for depth > 50m. Resolution can be commanded for an in situ study. Is this sufficient for observations such as water surface features or ice-edge phenomena?*

   • *Separation of the VSWIR and Thermal instruments*

W120A Ecological forecasting: products, requirements & issues [*Susan Ustin*]

W305 Instruments concept (IC-2): discussing benefits and concerns from having VSWIR & TIR on separate platforms [*Simon Hook & Rob Green*]

17:30 Adjourn

6:30pm Happy Hour & Dinner [Ruby Tuesday]

DAY 2 (May 30): Morning Agenda

8:00 Registration/ Posters in Room W120B/ Coffee

8:30 Environmental & Human Impacts including Disasters, Natural Hazards, Water Management and Public Health, W150 [*Chair: Jeff Luvall, NASA/MSFC*]

8:30 Traceability matrix, HyspIRI products in support of SBA requirements [*Jeff Luvall, NASA/MSFC*]

8:50 Ecologic niche models for neglected tropical diseases (NTD) in data-scarce landscapes based on environmental suitability and poverty-related risk factors at the census tract level used for operational community-based intervention programs [*John Malone, Louisiana State University*]

9:10 Volcanic CO_2 measurements from hyperspectral data [*Fabrizia Buongiorno, INGV*]

9:30 The feasibility of systematic inland water quality monitoring with HyspIRI [*Arnold Dekker, CSIRO*]

9:50 Discussion [*Chair: Jeff Luvall*]

10:10-10:30 Coffee Break

10:30 Automated, Rapid Processing for Low Latency Data Products, W150 [*Chair: Dan Mandl, NASA/GSFC*]

10:30 IPM Update and Preliminary Low Latency User Requirements [*Dan Mandl, NASA/GSFC*]

10:45 An open GeoSocial API to meet societal needs [*Pat Cappelaere, Vightel Co.*]

11:00 Rapid Co-Registration with Landsat GLS [*Maria Sazama, NASA/GSFC*]

11:15 Geo-correction for Airborne Platforms [*Vuong Ly, NASA/GSFC*]

11:30 EDOS high-rate data capture and delivery of low-latency HyspIRI level-zero data [*Bruce Mclemore, Honeywell*]

11:45 Discussion [*Chair: Dan Mandl*]

12:00 – 13:00 Lunch

DEMO: ENVI Services Engine for Web-Accessible HSI Applications, W120A [*Thomas Harris*]

DAY 2 (May 30): Afternoon Agenda

13:00 Special Topics, W150 [*Chair: Stephen Ungar*]

    13:00 Current and future hyperspectral instruments [*Michael Abrams, NASA/JPL*]

    13:20 HyspIRI Spectral Library: concept, status and requirements [*Simon Hook*]

    13:40 Role of imaging spectrometer data for model-based cross-calibration of imaging sensors
        [*Kurt Thome, NASA/GSFC*]

    14:00 Spectral time series for the study of ecosystem function, using EO-1 Hyperion
        [*Petya Campbell, UMBC*]

    14:20 Linking terrestrial biosphere models with imaging spectrometry measurements of ecosystem
        composition, structure and function [*Paul Moorcroft, Harvard*]

    14:40 Discussion Synopsis: Ecological Forecasting for Terrestrial and Aquatic Ecosystems [*Susan Ustin*]

14:50-15:15 Coffee Break

15:15 Interactive Poster Presentations, W150 [*1 slide/poster, 2 min/each*]

16:00 HyspIRI products in support of Societal Benefit Areas: *Synopsis from Discussion Sessions and*
    Open Discussions, W150 [*Chairs: Woody Turner & Elizabeth Middleton*]

    16:00 Coastal and Inland Aquatic Data Products Break-Out [*Kevin Turpie*]

    16:10 Environmental & Human Impacts [*Jeff Luvall*]

    16:20 Rapid Processing for Low Latency [*Dan Mandl*]

    16:30 Instruments concept: impacts on higher level products from placing VSWIR & TIR instruments on
        separate platforms [*Rob Green & Simon Hook*]

    16:40 Open Discussions

17:00 (W150) **Summary and review of <u>report outline</u>** [*Elizabeth Middleton & Petya Campbell*]

17:30 Adjourn

NASA Decadal Survey HyspIRI