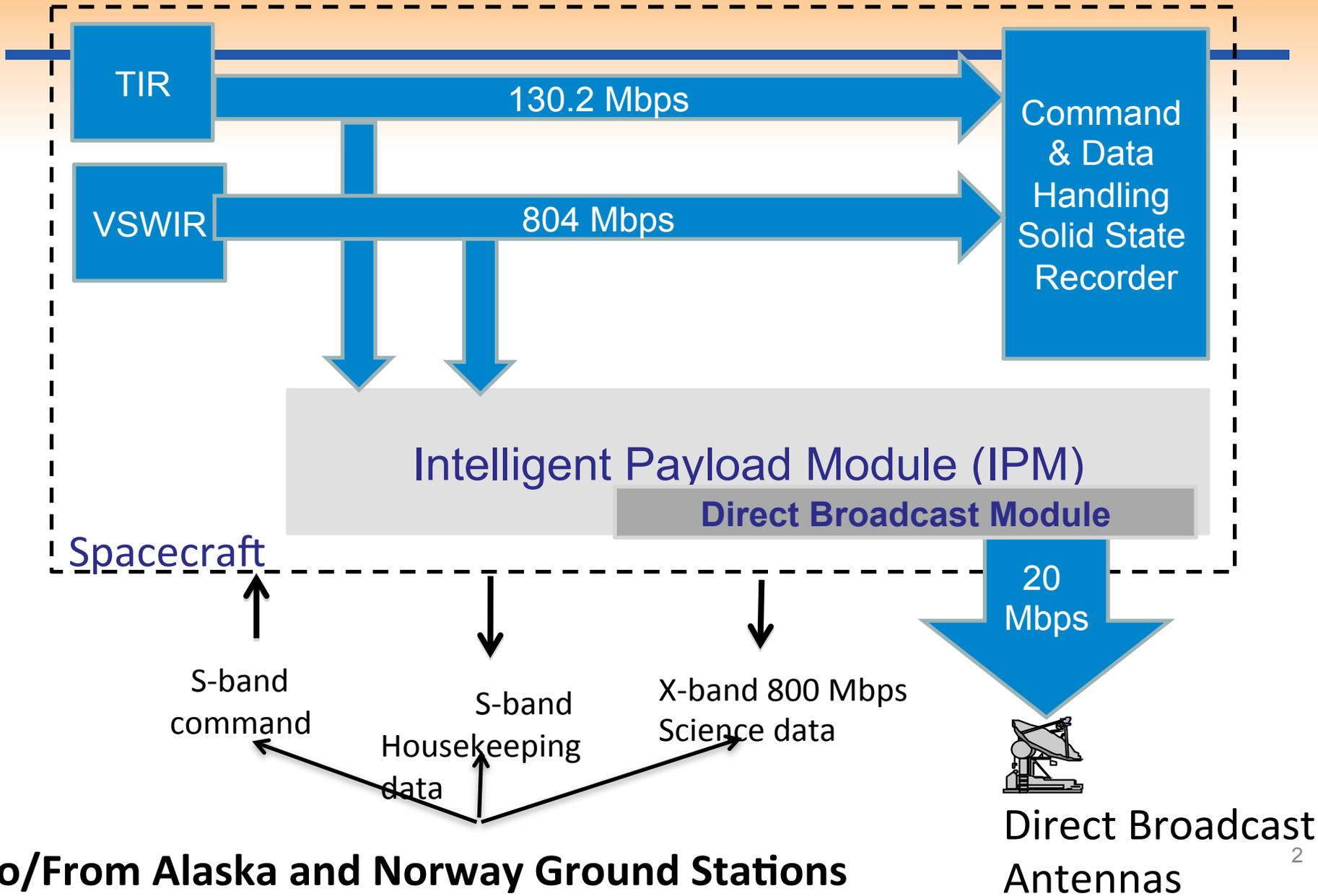


IPM and Low Latency Ops Concept Status

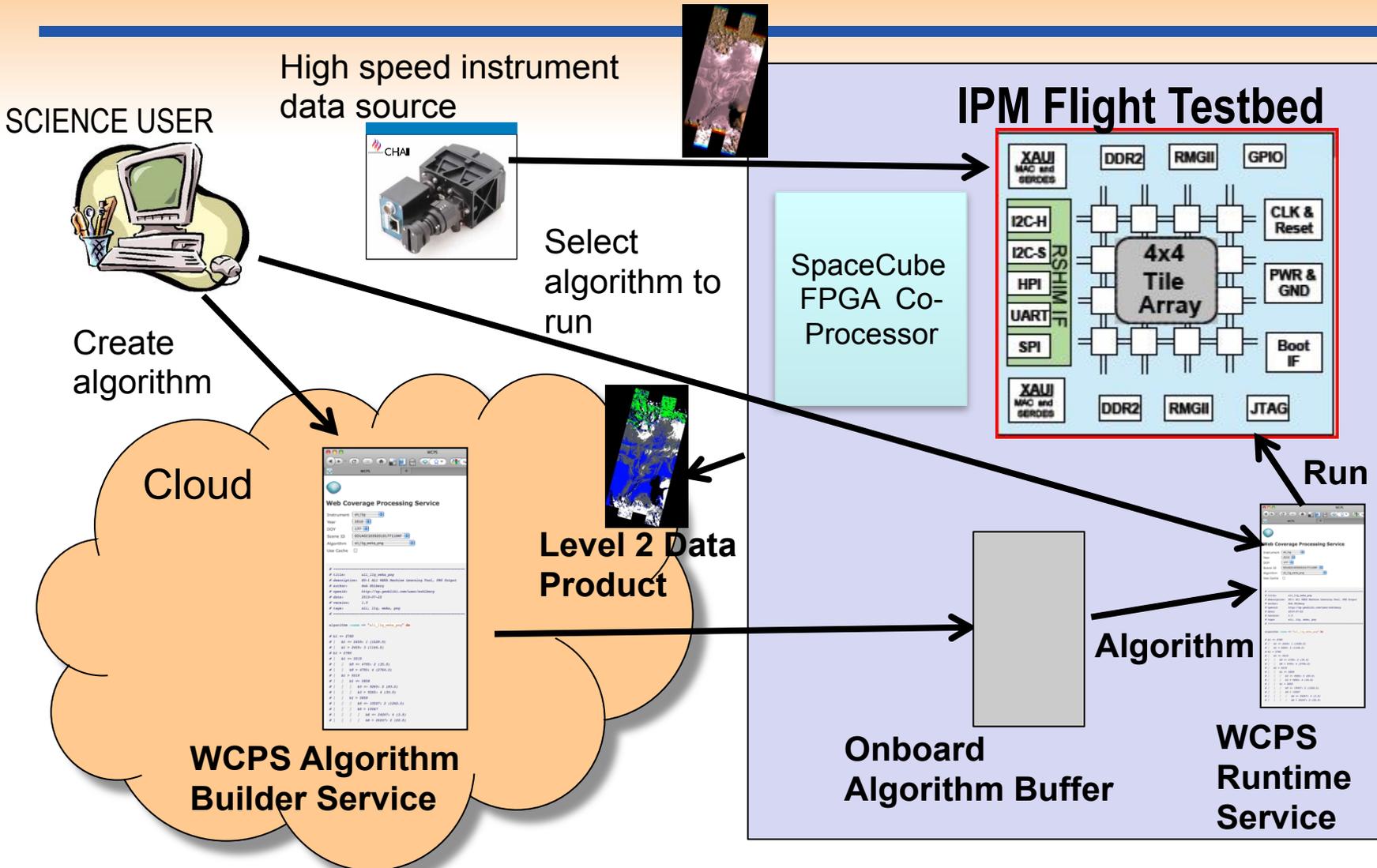
Dan Mandl

**HyspIRI Symposium
May 30, 2013**

Original HypSIRI Low Latency Data Flow Operations Concept (Intelligent Payload Module)



Revised Low Latency Ops Concept



HypsIRI Mission concept evolving so making low latency concept more generic with some combination of ground cloud computing and on-board multicore processor.

EO-1 Cloud Computing Functionality



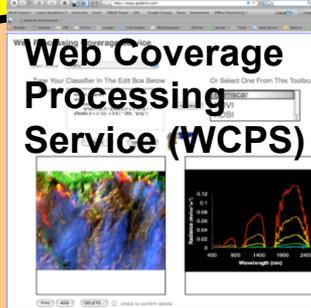
Technologists
NASA Investigators
Disaster Responders

Matsu Cloud

http server

Level 1R and Level 1G
Processing for ALI & Hyperion

Co-registration with Landsat GLS



Multi year data
product archive

Starlight 100
Gigabit Ethernet
Exchange

Hyperion and ALI
Level 0 Processed
data from GSFC,
building 3 server

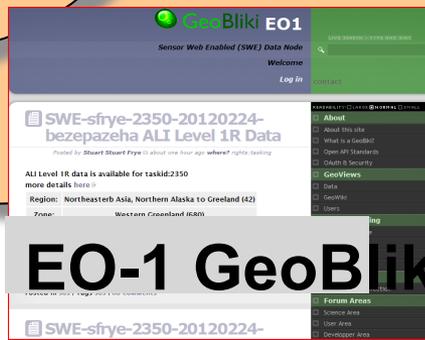
Atmospheric
Correction for
ALI & Hyperion

Joyent Cloud

Identifier	Path	Mode	Resolution	Acquisition Date	Acquisition Time	Cloud Cover	Download Status
EO1-AL1-001-001-001-001	EO1-AL1-001-001-001-001	Full	30	2002-09-08	00:00:00	0.0	Download
EO1-AL1-001-001-001-002	EO1-AL1-001-001-001-002	Full	30	2002-09-08	00:00:00	0.0	Download
EO1-AL1-001-001-001-003	EO1-AL1-001-001-001-003	Full	30	2002-09-08	00:00:00	0.0	Download
EO1-AL1-001-001-001-004	EO1-AL1-001-001-001-004	Full	30	2002-09-08	00:00:00	0.0	Download
EO1-AL1-001-001-001-005	EO1-AL1-001-001-001-005	Full	30	2002-09-08	00:00:00	0.0	Download

EO-1 GeoBPMS

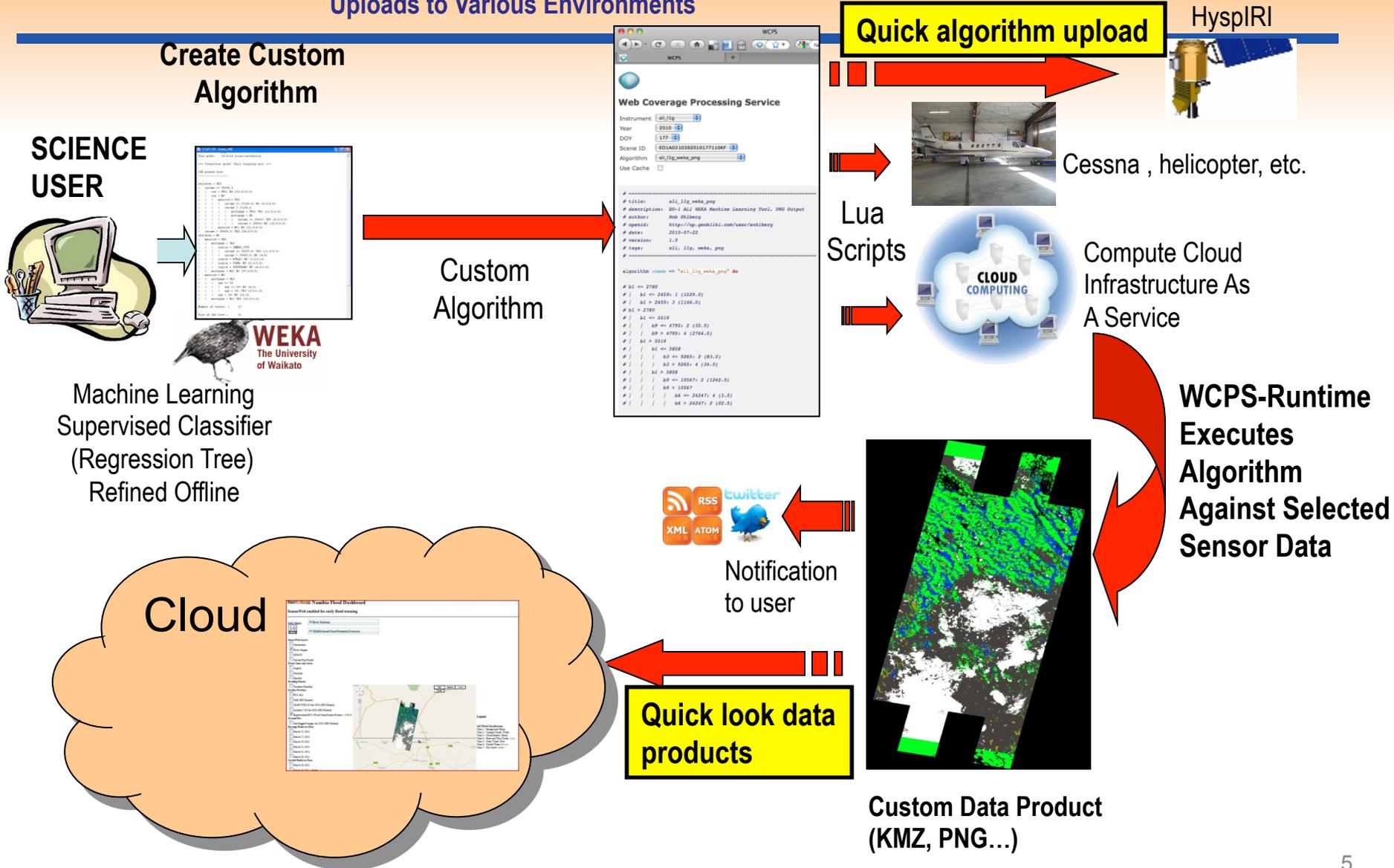
Joyent Cloud
•Ruby on Rails
•3 processors
•3 Tbytes of storage



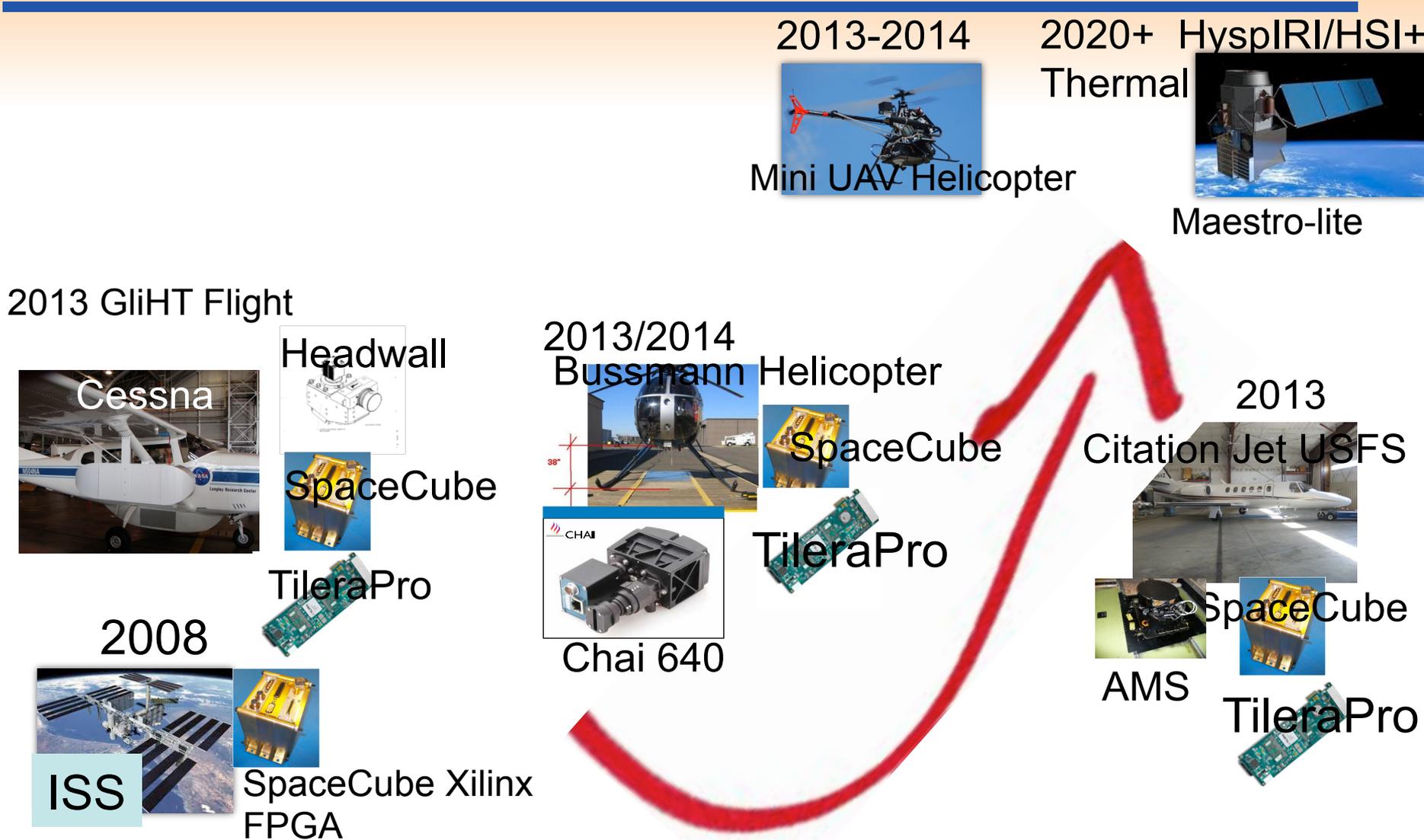
EO-1 GeoBliki

Experimental Intelligent Payload Module Quick Load/Quick Look Ops Con

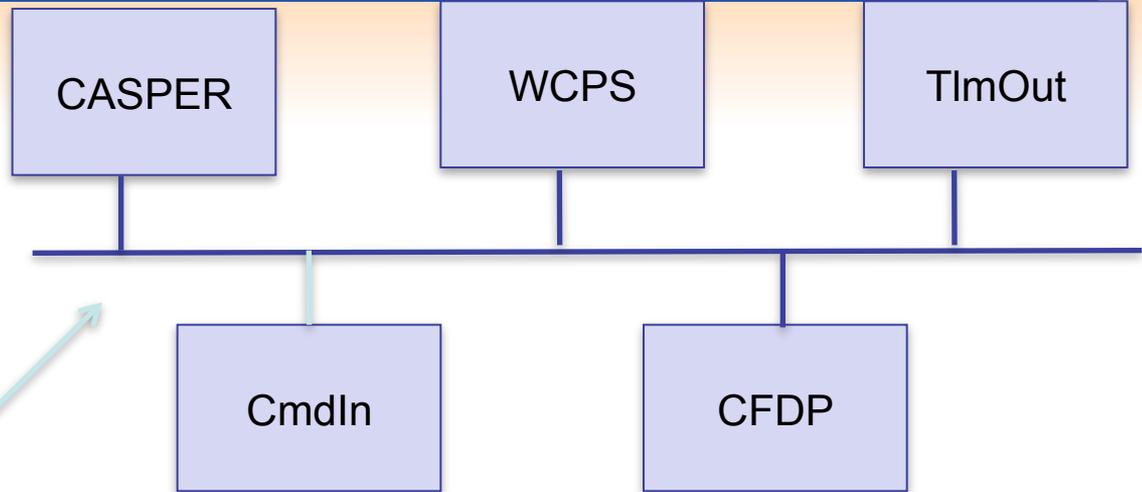
Web Coverage Processing Service (WCPS)-Client
Uploads to Various Environments



Roadmap for IPM Flight Opportunities



Flight & Ground Architecture Using Operational SW Components



WCPS – Web Coverage Processing Service

CmdIn – Command Ingest

TImOut – Telemetry Output

CASPER - Continuous Activity Scheduling Planning Execution and Replanning system

CFDP - CCSDS File Delivery Protocol

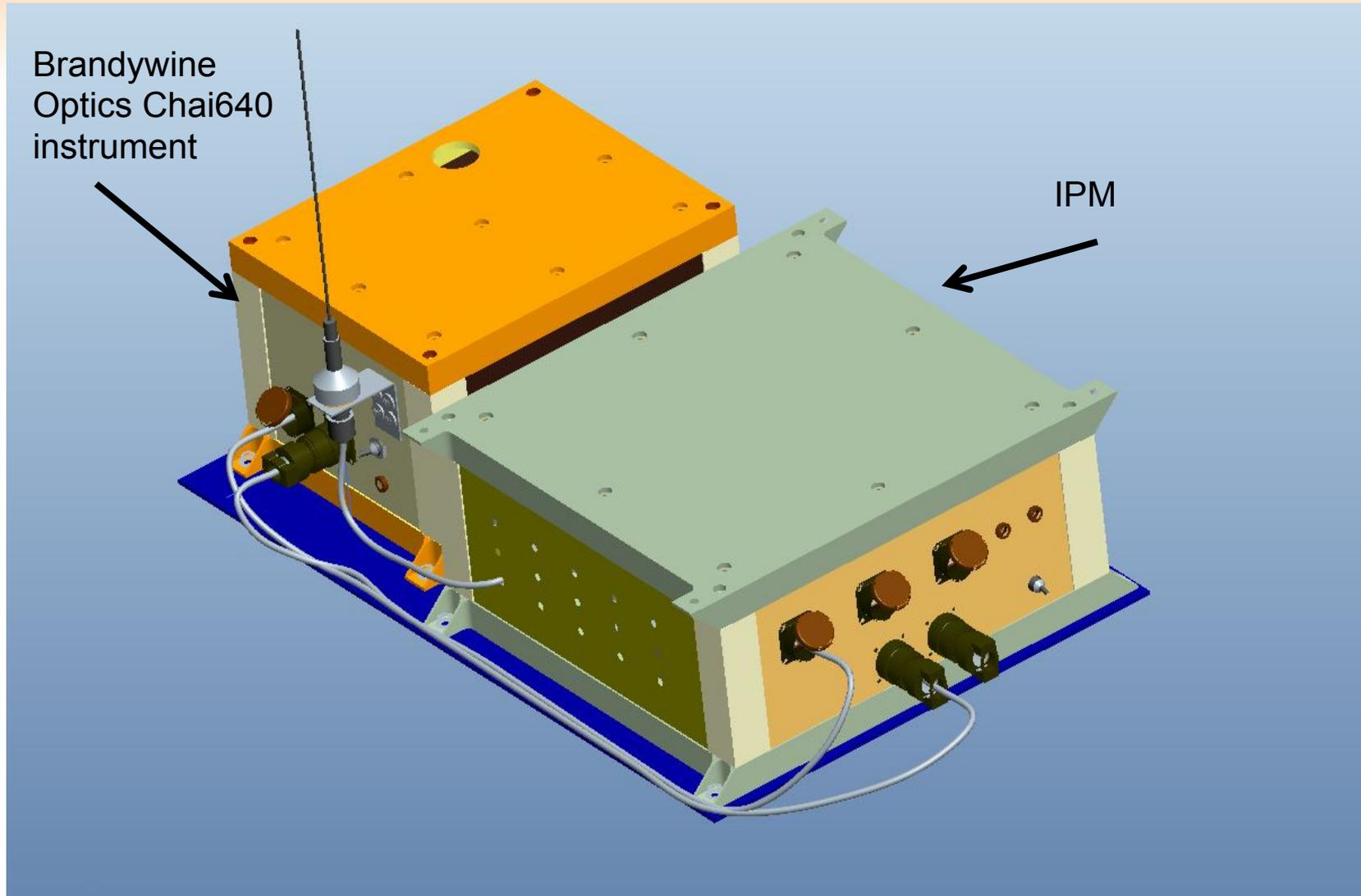
ASIST - Advanced Spacecraft Integration and System Test Software

First Calibration Test with Chai V640 Imaging Spectrometer Instrument (5/16/13)

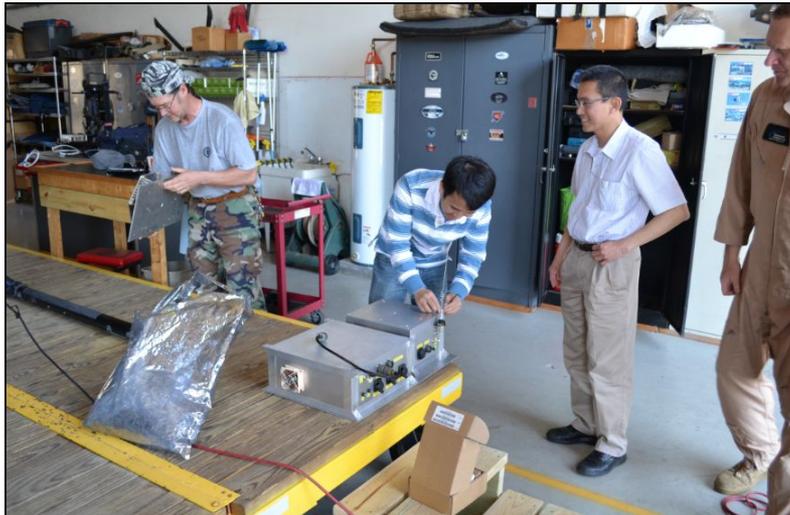


Visible image constructed from test data

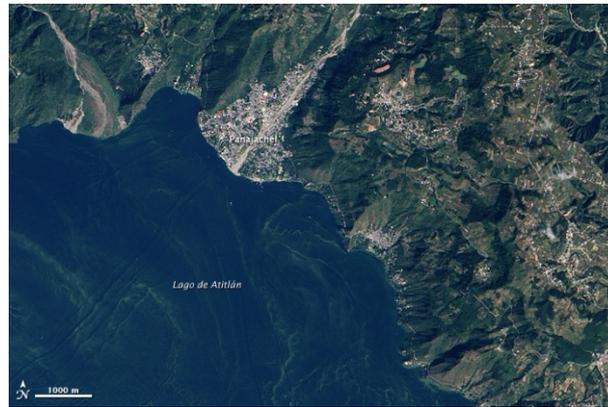
Intelligent Payload Module Assembly with Chai640



Beginning Integration Process on Helicopter



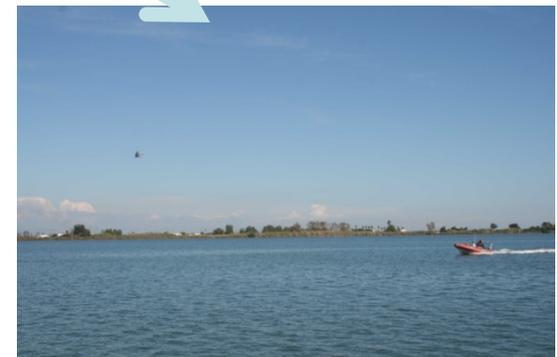
Sample Operational Scenario: Detection of Harmful Algal Blooms with Rapid Map Downlinked to Validation Team on Ground



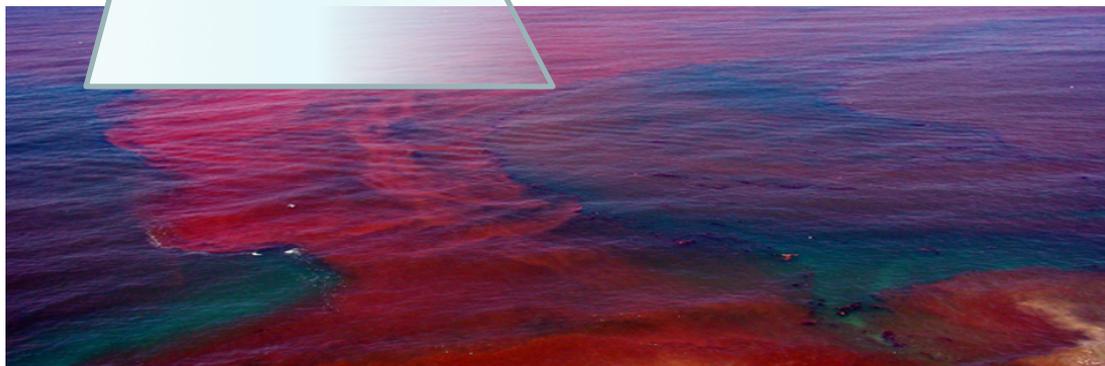
- Realtime map with following processing steps:
- ✓Radiance to reflectance conversion
 - ✓Atmospheric Correction
 - ✓Geocorrection/Co-registration
 - ✓Classification



Downlink to Ipad



Validation team in boat being directed to location by rapid map product



Harmful Algal Bloom

Unmanned Aerial System Jellyfish Monitoring Mission with IPM (Univ. of Catalunya)



Area of interest: Delta del Ebre south of Barcelona. Multiple Australian jellyfish being increasingly detected.



First test mission: Late summer 2012

Initial low-altitude mid-altitude images successfully acquired.

<http://www.youtube.com/watch?v=Uam7-thvM80>

