National Aeronautics and Space Administration

Airborne Science Newsletter

Spring 2016

What's Inside...

In Brief ...

P-3 Update

The P-3 currently remains in re-wing in Waco, TX. However, the new wing installation and aircraft painting has been completed. Final engine maintenance and leak checks are in work and the aircraft is scheduled for a Functional Check Flight on 5/26/16. In addition to the new wing installation the aircraft floor boards were refurbished to include new floor covering material and all the P-3 bubble windows were replaced. Once the aircraft returns to WFF late May/early June upload will begin for the ORACLES Earth Venture mission followed by deployment to Namibia in the August/September timeframe. Upon completion of the ORACLES 2016 mission the NP2000 propeller system upgrade is planned for the fall 2016.

Operation IceBridge

Success at both ends of the globe

Operation IceBridge (OIB) wrapped up a successful year in 2015 with an exciting and historic first for the project in undertaking simultaneous collection of data from both the Arctic and Antarctic. These campaigns marked a temporary change from the traditional usage of low-flying aircraft missions with a large instrument suite to the use of high altitude aircraft equipped exclusively with laser altimeters and digital imaging systems to map changes in the polar ice covers. The Arctic campaign utilized an HU25C Guardian aircraft and the Antarctic campaign was flown on a Gulfstream-V aircraft.

The Antarctic campaign logged 17 research flights totaling 172 flight hours and traveled a distance equivalent to 3.4 times around the Earth. Nearly 60,000 images and 2 terabytes of laser altimeter data were taken on the campaign. Highlights of the campaign included the continuation of key measurements of the Antarctic Peninsula, Pine Island and Thwaites glacier areas, and Weddell and Bellingshausen Seas. An under-flight of ESA's CryoSat-2 satellite was also conducted with near perfect timing along a line in the Weddell Sea. With the usage of high altitude aircraft, opportunistic data was taken on transit over Costa Rica in support of NASA's GEDI (Global Ecosystem Dynamics Investigation Lidar) mission, a series of Chilean volcanoes in support of hazard mitigation, as well as some fast changing glaciers in the Patagonian ice field. Two Chilean military observers also accompanied the flights as a gesture of good will for the excellent support provided by Chile in the basing of aircraft operations in their country.

Continued on page 3

View from the ground of the Canadian survey team as IceBridge flies over the survey area near Eureka in support of OIB. Photo credit: Arvids Silis, Environment and Climate Change Canada

ASP Customer Service Survey

The Airborne Science Program commissioned Harlan Brown & Co. to do an independent survey of program service users regarding their perspectives and experience with the program. Jerry Pawlikowski conducted the survey between December and February, performed an analysis of the data and briefed the results to Earth Science Division leadership at HQs, and center and program leaders at Wallops Flight Facility and Armstrong Flight Research Center in March and April.

Through this customer perception study of our market, we heard from 44 mission scientists, PIs and others from the ASP user community to establish a reliable baseline of information on how our customers view us, on what we do well, what we do poorly and how we can improve our performance to the Earth science community who depend on NASA's airborne science capabilities and facilities.

Mr. Pawlikowski's key conclusions consist of:

- Study results are mostly positive, keeping in mind high customer expectations, on-going Wallops EVS-2 mission issues, Armstrong issues, and budget pressures. Current ASP performance trend is highly encouraging.
- Fairly high, consistent expectations exist for NASA ASP. 68% or more of sources identified four key ASP expectations: 1) facilitating/executing missions, 2) team playing/can-do spirit/flexibility, 3) having access to, maintaining and investing in aircraft, and 4) ASP being a science enabling organization.
- High expectations may exist for ASP but 68% of sources, including 76% of NASA sources, question its relationship and how much influence it has at the NASA flight Centers.
- ASP is highly respected by mission scientists. They identified 5 key strengths: 1) ASP's people/management, 2) ASP's platform portfolio, diversity, reliability and heritage, 3) mission success/good science results on its ER-2, DC-8, WB-57, G-III, and C-23 Sherpa, 4) actual/in-field mission execution/pilots and 5) ASP being customer driven.
- 14 different key ASP weaknesses/areas for improvement/concern areas emerged. However, six of them appear to be most significant: 1) Armstrong issues, 2) concern regarding its aging fleet, 3) disuniformity across platforms/Centers, 4) stretched resources, 5) Global Hawk issues, and 6) anticipating aircraft needs/pushing the envelope.
- ASP's overall performance is strong at just under 4. Early stage mission execution, EVS-2 mission issues, Armstrong and Wallops issues, and schedule performance weigh down ASP's current performance.
- ASP's past five year and current performance trend data is mostly positive. 43% of study sources see an improving current performance trend and 29% see a steady current performance trend at ASP.
- ASP's mission success is also strong at a 4 overall. However, various concerns were expressed with regard to Wallops and three EVS-2 missions – ACT-America, NAAMES and ORACLES.

Although we are still digesting the inputs, we've learned a great deal from the study and have initially identified several customer-focused initiatives we plan to pursue as a result of the feedback and will continue to analyze and act on survey inputs for the foreseeable future.

As we implement these actions, we will monitor our progress and determine the degree to which our user community recognize improvements and other changes we are making in how we do business with our community. We will be reporting on the actions we take to address this survey's inputs through articles in our newsletter and on our web page. In addition, we are planning a follow-up perception survey in 2 to 3 years to see how we have or have not improved.

The Airborne Science Program wants to thank those who participated for taking the time to speak with Mr. Gerald Pawlikowski of Harlan Brown & Company and for providing useful inputs to him with their candid comments and perceptions concerning NASA ASP.

Contributed by Randy Albertson

Directors' Corner

Welcome to the Spring ASP newsletter. We are off to another busy year, flying over 1,600 hours for Earth Science so far. We have several major campaigns ongoing including Operation IceBridge in the Arctic on the NOAA P-3 and KORUS-AQ flying in Korea on the DC-8 and the B200. You'll notice in this newsletterr an article on a customer perception study that we did. We are in the midst of figuring out how to improve the program based upon the feedback we have received. We take the survey seriously and really appreciate the candid feedback. It's not always fun looking in the mirror but it's an important part of a program that seeks to better itself. In my opinion, we are never good enough and must always continue to improve, which is why Randy and I constantly ask for feedback. I hope you get a chance to do some outstanding science data collection while enjoying the spring and summer months with friends and family. Be safe and I'll end with my customary farewell: **If you have any feedback about this newsletter or the Program – good or bad – please let Randy and me know.**

Bruce Tagg and Randy Albertson
Airborne Science Program

OIB *(continued from page 1)*

The Arctic fall campaign was a new mission concept designed to attain measurements of the Greenland ice sheet and Arctic sea ice cover just after the summer melt season had occurred. The mission completed 22 science flights over 98 flight hours using a laser altimeter, optical imager, and a new thermal IR camera. The flight lines were repeats of high priority lines from the previous Arctic spring campaign to measure the amount of melt which occurred over Greenland during the summer. The flights also mapped the thick perennial sea ice cover north of Greenland and coordinated an under-flight of the CryoSat-2 satellite. Images from the campaign were featured on the cover of the New York Times magazine, which was accompanied by an in-depth feature story.

As of this writing, the Arctic spring campaign is underway and is back aboard a low-altitude P-3 aircraft containing the traditional IceBridge laser, radar, and imagery measurement suites. To date, the campaign has conducted missions over the Arctic sea ice cover with later missions over Greenland planned. Highlights have included an overflight near Canada's Eureka station in coordination with a ground survey team from Environment and Climate Change Canada, and an under-flight of the recently launched ESA/EUMESAT Sentinel-3A satellite. Outreach activities with in-flight classroom chat sessions between IceBridge researchers and K-12 students are also ongoing and have attained a cumulative total of nearly 5,000 students reached over the course of the project.

Contributed by Nathan Kurtz

Cockpit view from the NOAA P-3 on approach to the Arctic Ocean during OIB. Photo credit: Jeremy Harbeck, NASA GSFC

OLYMPEX

Succeeds under perfect (rainy) weather conditions

Clouds and precipitation were the focus of the Olympic Mountain Precipitation Experiment (OLYMPEX), a NASA-led field campaign coordinated with the University of Washington and conducted on the Olympic Peninsula from November 2015 through February 2016. The campaign combined the research interests of two NASA flight missions: the Global Precipitation Measurement (GPM) mission that launched in 2014, and Aerosol-Cloud-Ecosystems (ACE) mission, which is in formulation. The goal of the campaign was to collect detailed atmospheric measurements that will be used to evaluate how well these satellites measure aerosols, clouds, rainfall and snowfall from space, and to improve the algorithms that convert satellite measurements into useful products.

The OLYMPEX campaign included an intensive observations period with coordinated airborne and ground-based measurements from a wide variety of instruments. NASA's ER-2 flew at high altitude with a suite of instruments primarily focused on aerosols and clouds: a set of radars, a profiling lidar, a polarimeter; and a microwave radiometer completed the ER-2 instrument set. NASA's DC-8 also flew above the clouds but at a somewhat lower altitude with a suite of precipitation instruments including radars and microwave radiometers as well as a dropsonde system to directly profile atmospheric wind, temperature and humidity. Flying through the clouds was the University of North Dakota's Cessna Citation aircraft equipped with an array of in situ instruments to measure water

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EVS-2 Missions Get Underway

All six of the Earth Venture Suborbital-2 missions are in initial stages of progress, as described below:

- NAAMES, flying on a WFF C-130 (NASA 439) completed its first mission series last November. Uploading is now underway for the second series in May.
- OMG on the JSC G-III is in progress with GLISTIN Ka-band radar installed. Modifications have been made to dispense AXCTD sonobuoys.
- ATom will fly on the AFRC DC-8 with uploads of the multi-instrument payload staring in June. ESPO personnel have been doing site surveys to the various campaign locations.
- ORACLES will fly on both the WFF P-3B and AFRC ER-2 (NASA 809). Site surveys have been accomplished by ESPO and AFRC.
- CORAL will use a commercial (Tempus Jets) G-IV. Following some modifications, the team deploys to Hawaii in June. In September, the mission moves to Australia.
- ACT-America will fly on the other WFF C-130 (NASA 436). Modifications are underway for a mission start in July.

RV Atlantis is the ocean observatory for NAAMES

OMG sonobouy launch system fit check

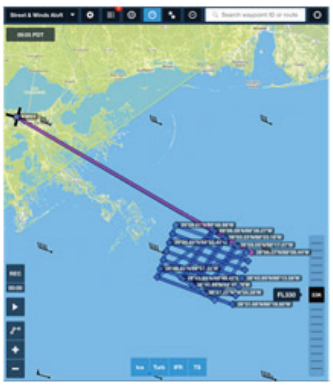
AirSWOT Participates in CARTHE Mission

AirSWOT, the airborne simulator for the upcoming Surface Water and Ocean Topology (SWOT) mission has been busy collecting data in preparation for that ESD satellite, as well a participating in a collaborative experiment with NOAA and consortium researchers. The Consortium for Advanced Research on the Transport of Hydrocarbon in the Environment (CARTHE) LAgrangian Submesoscale ExpeRiment (LASER) mission took place in February in the Gulf of Mexico, with the Armstrong B200 carrying the AirSWOT sensor, which is a Ka-band radar. (CARTHE is a research team dedicated to predicting the fate of oil released into our environment.) The major portion of the experiment involved ship-board measurements, with the airborne component provided by AirSWOT.

The aircraft mission logged a total of 35.9 hours in nine flights - five science flights in the New Orleans area (23.4 Hours) and four flights transit flights (12.5 Hours) between AFRC and New Orleans. The PI for the JPL AirSWOT instrument is Ernesto Rodriguez.

The figures show the planned and actual flight tracks for one science flight, and the mission team.

Contributed by Roger Chao

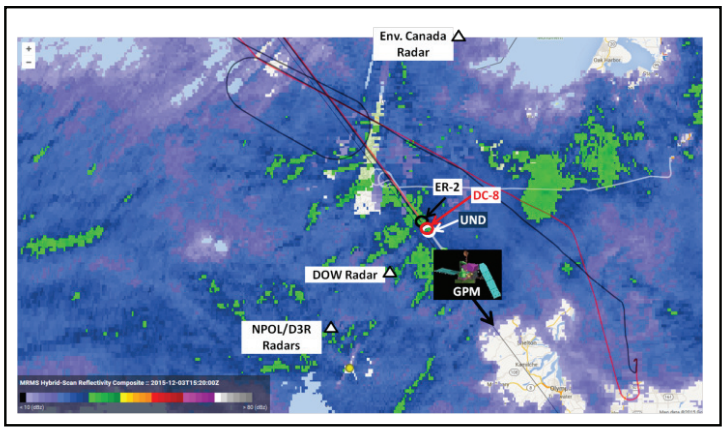


Flight plan as designed by PI

Actual flight tracks

AirSWOT Team: Mario Soto, Hernan Posada, Bart Henwood, Roger Chao, Sam Habbal, Jessy Gray.

OLYMPEX *(continued from page 3)*



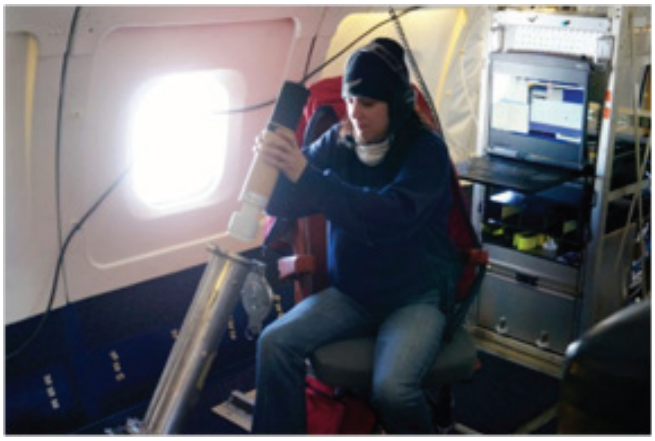
OLYMPEX Catches a GPM Core Overpass with a 3-Aircraft stack (DC-8, ER-2, UND Citation) under the coverage of ground polarimetric radars in a challenging situation of complex stratiform precipitation over the Olympic Mountains, December 3, 2015 (1522 UTC).

Jet Propulsion Laboratory researcher Willam Chun stands up to chat with colleagues in NASA's DC-8 jet while NASA's Chris Jennisen, at right, mans the mission control station. (GeekWire photo by Alan Boyle)

in all of its phases: as vapor, liquid droplets, and frozen particles. Flights were coordinated as dictated by the scientific objectives of the campaign, often with all three aircraft simultaneously observing the same volume of a storm. This was a first for GPM. On several occasions storms were observed by the stacked aircraft as well as the GPM satellite.

Finally, the Airborne Snow Observatory (ASO), which consists of an Imaging Spectrometer and Lidar, flew on a Twin Otter aircraft to measure snowpack depth over the Olympic Mountain domain. The ASO made "no-snow" flights over the Olympic Mountains during the summer of 2015, and then flew again in late winter/early spring 2016 to estimate accumulated snowfall as part of the OLYMPEX campaign.

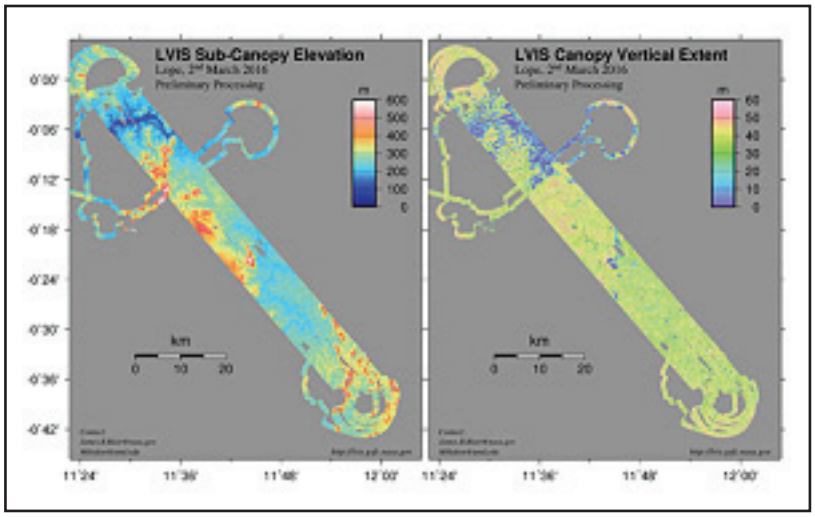
Contributed by Matt Schwaller and Walt Petersen



Laura Tudor, lead dropsonde technician at the National Center for Atmospheric Research, gets ready to put a dropsonde down a launch tube on NASA's DC-8 research aircraft. (GeekWire photo by Alan Boyle)

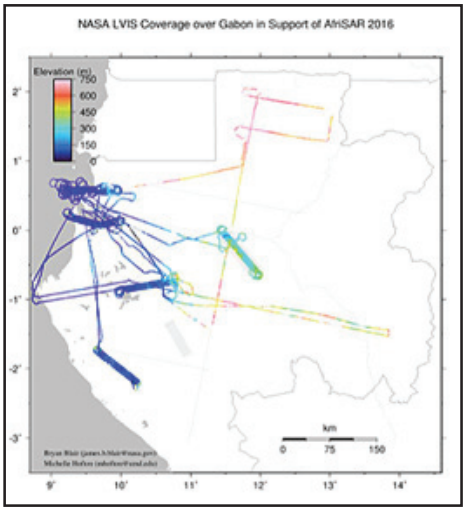
AfriSAR: Successful Ecology Mission for LVIS and UAVSAR

NASA recently concluded the AfriSAR mission, a NASA-Headquarters directed and funded deployment to Gabon to collect measurements of plant mass, distribution of trees, shrubs and ground cover, and diversity of plant and animal species — not only from Gabon's rainforest but also from the country's wetlands, mangrove forests and savanna. The data will help prepare for and calibrate four current and upcoming spaceborne missions for NASA, the European Space Agency (ESA) and the German Space Agency (DLR) that aim to, among other goals, better gauge the role of forests in Earth's carbon cycle. Furthermore, the forest data gathered in Gabon might help to inform policymakers working on climate mitigation and forest conservation policies. AfriSAR is NASA's first collaboration with Gabon's young space agency, AGEOS, and also its first large international campaign in Africa since NASA participated in a hydrological study of the Sahel in the early 1990s.



The Lope site coverage - both ground elevation and canopy height. (quicklook processing).

Two NASA aircraft participated in the AfriSAR mission – the Langley B-200 King Air carrying NASA Goddard's Land, Vegetation and Ice Sensor (LVIS), a scanning lidar altimeter, and the Armstrong C-20A carrying the JPL UAVSAR. The German DLR DO-228 also participated. The base of operations was Libreville, Gabon.



Final mission coverage - more specifically, elevation for the areas where we got a surface return.

B-200 / LVIS Deployment

LVIS took direct measurements of sub canopy topography, canopy height and canopy metrics at 25-m resolution for selected plots, lines and areas from an altitude of 28,000 ft. The total mission of 31 flights, including two local data flights at NASA Langley and 20 transit flights to and from Gabon, accumulated 106.5 flight hours on the NASA Langley B200 aircraft. A total of nine research flights (32.4 flight hours) were flown in Gabon. For those interested, trajectories (kmz and shapefiles) for the science flights can be found on the LVIS website at: http://lvis.gsfc.nasa.gov/Gabon2016Map.html

Following is a summary of the coverage achieved with LVIS in support of the AfriSAR campaign:

- Science flights (8): 32 hours, mapping in excess of ~7,000 km2.
- LVIS accomplishments:
  - Mapping of the RABI, IRD, Mondah, and Lope ESA priority sites (and paying particular attention to getting data from ground plots at these locations).
  - Coverage of ~400km of the TandemX line, a section of this was co-temporal with the DLR sensor.
  - Excellent coverage of the W-E Biomass Gradient Transect line.
  - Numerous roughly E-W oriented transects for comparison to on-orbit GEDI data.
  - Mapping of the Pongara mangrove site.
  - Coverage of ~ 200km of an ICEsat track as no-impact transit data collection (for Icesat/ GEDI simulations)

The following personnel participated in AfriSAR: Christy M. Hansen, Goddard Airborne Science Manager; Temilola Fatoyinbo, AfriSAR Project Scientist and NASA's official point of contact in Gabon; J. Bryan Blair, LVIS Principal Investigator; Michelle Hofton, LVIS team partner.

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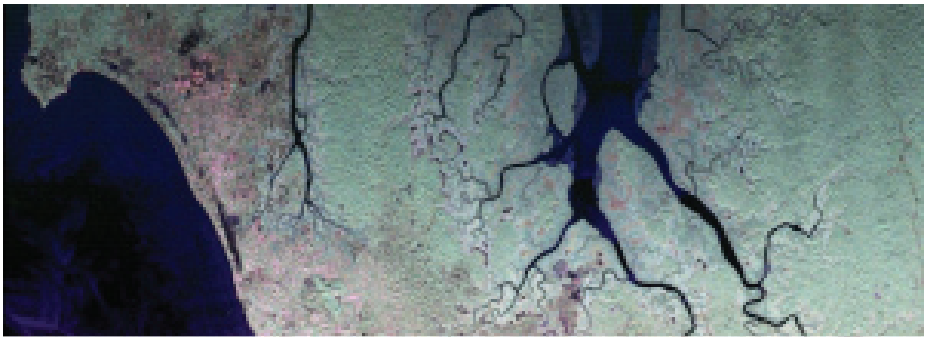
AfriSAR *(continued from page 6)*



UAVSAR PolSAR image over Akanda, Gabon. This is a false-color image where color channels represent the contribution of 3 radar polarizations: HH, HV, VV.

ecosystems. Fifty six PolSAR images are ready for download from the UAVSAR webpage: http://uavsar.jpl.nasa.gov/cgi-bin/data.pl. Links to all available products can be found by typing "afrisar" or "gabon" into the search box. Below is an example image covering the city of Libreville and Akanda National Park. Users are invited to explore this and other datasets by downloading our Google Earth overlay (KMZ) files.

C20-A / UAVSAR Deployment

NASA's C20-A aircraft, carrying the JPL UAVSAR also participated in UAVSAR during February-March 2016. Coordinated data collection by ground crew and multiple airborne instruments has yielded an unparalleled dataset for tropical ecosystems. Researchers will analyze AfriSAR images to develop and test new algorithms to quantify carbon fluxes in the tropics, in preparation for future satellite missions – NISAR, GEDI, and BIOMASS.

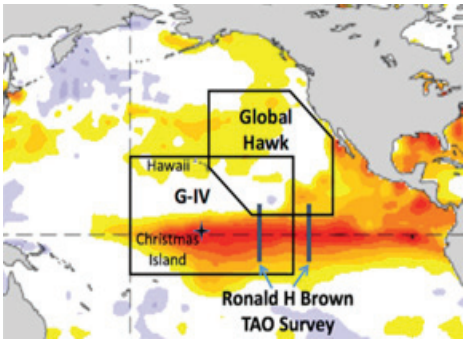
Due to weather, instrument, and aircraft issues, the crew had to constantly adjust their schedule and data collection strategy. Pilots, engineers, and ground crew worked tirelessly to maximize the science output from each flight. We acquired 89% of the 72 planned flight lines.

The AfriSAR deployment lasted 23 days and encompassed 84 flight hours, including a short leg to image sites in the US Gulf Coast. The C20-A flew to Gabon via Louisiana, Barbados, and Cape Verde. All local data were collected with 8 flights out of Libreville International airport. This was our largest multi-instrument deployment, our first time in Africa, and it provided a great opportunity to learn from and interact with our colleagues from other NASA centers. We received great support from the US Embassy in Gabon as well as the Gabonese government.

UAVSAR data products acquired during the AfriSAR deployment will support novel approaches to characterize tropical

C20 Team (L-R): John McGrath, Carlos Maza, Stuart Broce, Samuel Choi, David Fedora, Naiara Pinto, Mark Scherer, Marc Simard, Vince Moreno, Chuck Irving, and Kean Tham.

Global Hawk Flies in NOAA El Nino Rapid Response Field Campaign



NASA's Global Hawk was part of a mission this spring to track storms developing in the Pacific Ocean to better predict severe West Coast weather. NOAA's Rapid Response Field Campaign, took take place from late January through the end of March 2016. Scientists launched a land, sea, and airborne research effort to better observe and document the responses to the current strong El Niño. Intensive observations gathered in the tropical Pacific provide a foundation to better understand how El Niño influences U.S. weather. In addition to the Global Hawk, NOAA also employed Gulfstream IV research plane and the NOAA ship Ronald H. Brown, as indicated in the mission map.

Flights of the Global Hawk to look at Pacific storms as they develop began February 12 and continued through February 22, with the weather co-operating fully by producing exactly the kind of storms scientists hoped to study. Three science flights, each between 23 and 25 hours in duration were completed. Some of that data were collected through the use of dropsondes released from the Global Hawk into the weather to gather temperature, moisture and wind speed and direction. Also onboard the Global Hawk was the High Altitude Imaging Wind and Rain Airborne Profiler (HIWRAP)instrument, operated and managed by NASA's Goddard Space Flight Center and the High Altitude MMIC Sounding Radiometer (HAMSR) instrument, managed by NASA's Jet Propulsion Laboratory. The instruments collect remote observations of the area, producing data similar to satellite observations. The final instrument, NOAA-O3, measures ozone at the altitude the aircraft is flying. Doppler radar is also used to track wind speed and direction. A total of 90 dropsondes were deployed among the three flights. NASA Armstrong's role included providing the aircraft, integrating the instruments into the aircraft, planning the missions as directed by the science team and then flying those missions.

The mission was designed to show how Global Hawk could augment satellites and routinely fly vast areas of the ocean, said Robbie Hood, director of the National Oceanic and Atmospheric Administration (NOAA) Unmanned Aircraft Systems program. "How do you use Global Hawks and actually chase storms?" Hood asked. "That's what we are looking at with these missions." The observation flights are part of an ongoing NOAA mission called Sensing Hazards with Operational Unmanned Technology, or SHOUT. SHOUT is a multi-year mission to show how the use of autonomous vehicles can fill in gaps in weather modeling and as a potential backup in case a satellite is unable to capture data. The Global Hawk can help fill a void over the Pacific Ocean that other assets, like satellites, cannot easily study, especially in the upper atmosphere where clouds can obscure observations. "Every place the Global Hawk flies is like a layer cake and we see how it stacks up," Hood said. "The data can be cross referenced and map areas in and around the storm, and we can watch how it develops. We are interested in understanding the data that can improve our ability to predict extreme weather." Gary Wick, lead NOAA scientist for the SHOUT mission, said the long-endurance flights provide information over a large area of the ocean like satellites do, but with greater resolution because the instruments are that much closer to the weather.

Contributed by Frank Cutler

KORUS AQ Begins

The Korean /US Air Quality project (KORUS-AQ) offers the opportunity to further advance NASA goals and those of its international partners related to air quality through a targeted field study focused on the South Korean peninsula and surrounding waters. The mission will operate out of Osan Air Base in South Korea in May and June of this year.

The three planes involved are NASA's DC-8 from Armstrong Flight Research Facility, NASA's B200 from Langley Research Center and a B200 from Hanseo University in Korea. Payload integration is complete and the LaRC B200 transit is underway. All 3 planes were expected to be on site by the end of April.

There are over 300 people involved in KORUS-AQ with approximately 150 people at Osan Air Base during the course of the mission. The mission will also include coordinated activities around monitoring stations including AERONET, PANDORA, TCCON, and other Korean ground research instrument networks in Seoul's Olympic Park and the Taehwa Forest Research University. Additionally, the seaborne research component, called KORUS-OC, will be conducted from the RV Onnuri, from Korean Institute of Ocean Science and Technology, (KIOST).

Contributed by Jhony Zavaleta

TRANSITIONS

Retirements

Mike Craig

Michael Craig, of the Earth Science Project Office (ESPO), is retiring this year. He has been the Director of ESPO for more than a decade and has managed many of Earth Science's multi-aircraft, multi-agency international field campaigns. His knowledge of aircraft and field missions is extensive and, with his leadership, ESPO achieved and maintained a reputation of excellence. He sets high standards for the whole ESPO team but he always manages to make it fun. He will be sorely missed but we wish him well with his retirement adventures.

Rick Shetter

Rick Shetter served as Program Director of the National Suborbital Education and Research Center (NSERC) at the University of North Dakota in support of the NASA Science Mission Directorate Airborne Science Program for the past 10 years. Previously, Rick was a scientist in the Atmospheric Chemistry Division of the National Center for Atmospheric Research and group leader of the Atmospheric Radiation Investigations and Measurements group from 1983 to 2005. He also worked at the University of Michigan's Space Physics Laboratory as an Assistant Research Scientist from 1976 to 1983. Rick was the principal investigator on 25 research grants and has more than 120 referred publications. Much of his research involved the use of aircraft to study the atmosphere including as a principal investigator on 15 research missions on the NASA DC-8.

In 2015, NASA awarded Mr. Shetter the Outstanding Public Leadership Medal honoring his sustained support strengthening and modernizing NASA's Airborne Science Program assets and capabilities through engineering management, training, and outreach. Mr. Shetter's superb efforts have directly contributed to the Airborne Science Program's ability to accomplish nearly 50 percent more airborne science, education and outreach in the past seven years than had been accomplished in the previous ten years and have left an indelible mark on the program and inspired a future generation of NASA Earth scientists.

Rick intends to spend more time with his wife, his children and granddaughters, golfing, and building a toy train layout. Oh, and of course, drinking some of the 900 bottles of wine in the cellar.

The position of Program Director has been filled by Dr. Melissa Yang, formerly of NASA Langley Research Center. (See following article)

Continued on page 10

ASP Upcoming Events

* NASA Carbon Cycle Meetings
  May 2-6, 2016; Silver Springs, Maryland
  May 2-3: Ocean Color Research Team meeting
  May 3-6: Biodiversity and Ecological Forecasting Team meeting; http://cce.nasa.gov/cce/meetings.htm?

* XPONENTIAL 2016 (Annual AUVSI Conference and Exhibit)
  May 2-5, 2016; New Orleans
  http://www.xponential.org

* 2015 Unmanned Systems Canada Annual TFRSAC 25!
  May 24-25, 2016; NASA Ames
  vincent.g.ambrosia@nasa.gov

* 6th Annual HyspIRI Data Product Symposium and Aquatic Forum
  June 1-3, 2016; Goddard Space Flight Center; http://hyspiri.jpl.nasa.gov/events/6th-annual-hyspiri-product-symposium-and-aquatic-forum

* 12th International Workshop on Greenhouse Gas Measurements from Space (IWGGMS-12)
  June 7-9, 2016; Kyoto, Japan; https://www.omc.co.jp/iwggms12/

* ESTO Earth Science Technology Forum 2016
  June 14-16, 2016; Annapolis, MD; https://esto.nasa.gov/forum/estf2016/index.html

* IGARRS 2016
  July 10-15, 2016; Beijing, China; http://www.igarss2016.org/

* AIAA AVIATION 2016
  July 13-17, 2016; Washington, DC
  http://www.aiaa-aviation.org

* AGU Ocean Sciences Meeting, 2016
  ASPRS UAS Mapping 2016
  September 12-14, 2016; Palm Springs, CA; https://uasreno.org/

* SMAP Cal/Val Workshop #7
  September 19-20, 2016; New York, NY
  http://smap.jpl.nasa.gov/events/45/

* SPIE Remote Sensing
  September 26-29, 2016; Edinburgh, UK; http://spie.org/conferences-and-exhibitions/remote-sensing?WT.mc_id=RERS16CE

* 2016 HyspIRI Science and Applications Workshop
  October 18-20, 2016; CalTech
  http://hyspiri.jpl.nasa.gov/events/hyspiri-science-and-applications-workshop

* UAS TAAC 2016
  December 13-15, 2016; Santa Fe, NM
  TAACREG@psl.nmsu.edu

Transitions *(continued from page 9)*

Melissa Yang is new NSERC director

The University of North Dakota recently appointed Melissa Yang as program director of the National Suborbital Education and Research Center (NSERC). NSERC is hosted at UND Aerospace in the Department of Earth System Science & Policy, part of the John D. Odegard School of Aerospace Sciences.

As program director, Yang is responsible for science operations support for various NASA airborne research platforms, including the DC-8, P-3 and C-130. She also serves as an interface to the scientific community.

Yang received her Ph.D. in analytical/atmospheric chemistry from the University of California, Irvine in 2009. She previously was a research physical scientist at NASA Langley Research Center and deputy project manager for the Radiation Budget Instrument.

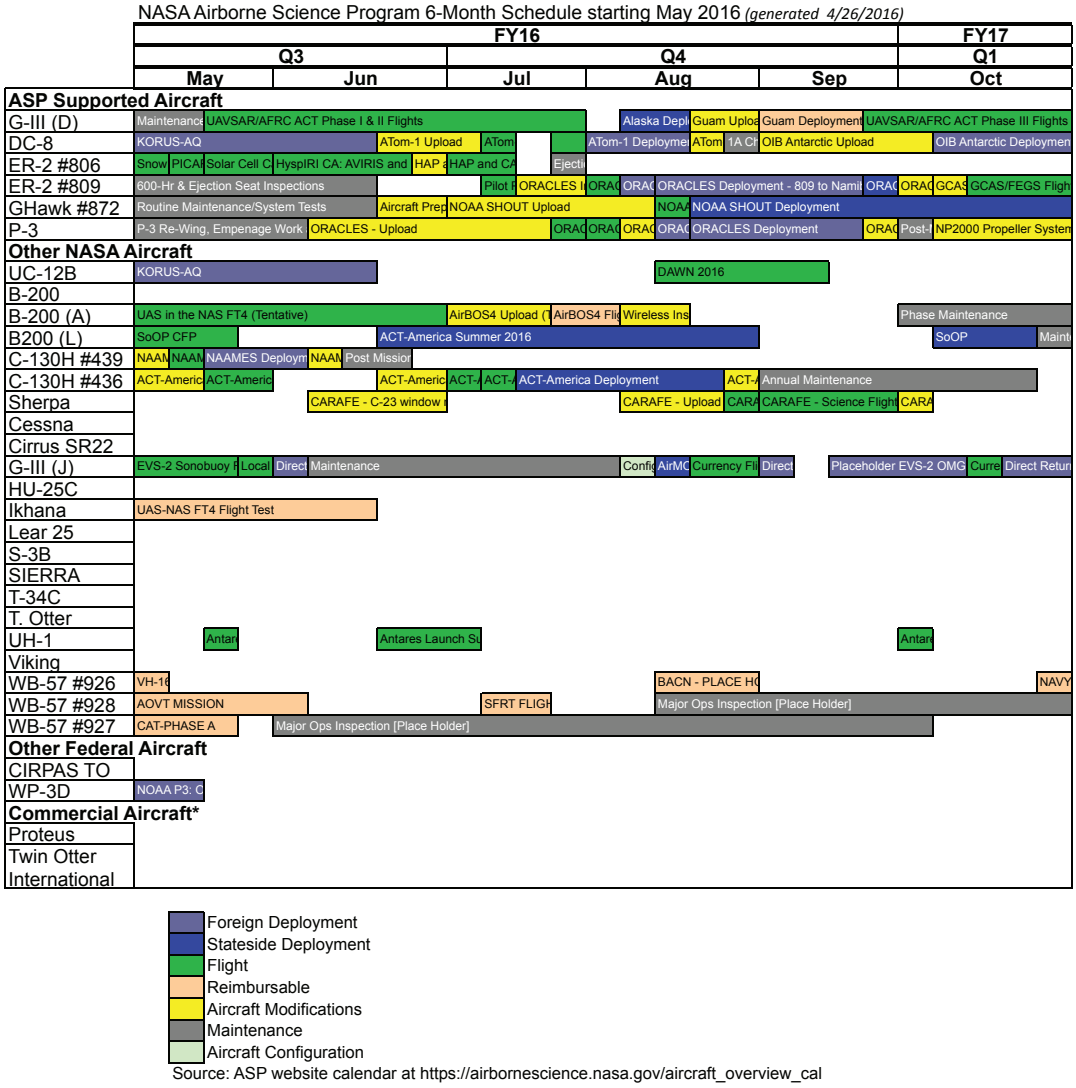
Yang also was Instrument Principal Investigator for the AVOCET (Atmospheric Vertical Observations of CO2 in the Earth's Troposphere) and PAMCO2 (Picarro Atmospheric Measurements of CO2) instruments.

Much of her research focuses on the study of the carbon cycle, source-sink attribution and use of "in situ" data for satellite validation.

Personnel Transitions

- Shane G. Dover is the new Director of the Research Services Directorate (RSD) at the NASA Langley Research Center. As Director of RSD, Mr. Dover is also the NASA Langley Chief of Flight Operations.
- Liz Juvera is the new Event Coordinator working with Ken Jucks and Hal Maring. Liz has replaced Kathy Thompson.
- Gary Hoffman is the new Sensor Data Analyst in the Airborne Sensor Facility. Gary replaced Bob Billings, who has retired.
- Ken Norlin is the new AFRC mission manager.
- Jim Alexander has moved from being a JSC G-II mission manager to a position at the University of Maryland.

NASA SMD ESD Airborne Science Program 6-Month Schedule



For an up-to-date schedule, see
http://airbornescience.nasa.gov/aircraft_detailed_cal

Call for Content

Working on something interesting, or have an idea for a story? Please let us know, we'd love to put it into print.

Contact Susan Schoenung (650/329-0845, susan.m.schoenung@nasa.gov) or Matt Fladeland (650/604-3325, matthew.m.fladeland@nasa.gov).

Airborne Science Program

Platform Capabilities

Available aircraft and specs

Airborne Science Program Resources	Platform Name	Center	Duration (Hours)	Useful Payload (lbs)	GTOW (lbs)	Max Altitude (ft)	Airspeed (knots)	Range (Nmi)	Internet and Document References
ASP Supported Aircraft*	DC-8	NASA-AFRC	12	30,000	340,000	41,000	450	5,400	http://airbornescience.nasa.gov/aircraft/DC-8
	ER-2 (2)	NASA-AFRC	12	2,550	40,000	>70,000	410	>5,000	http://airbornescience.nasa.gov/aircraft/ER-2
	Gulfstream III (G-III)(C-20A)	NASA-AFRC	7	2,610	69,700	45,000	460	3,400	http://airbornescience.nasa.gov/aircraft/G-III_C-20A_-_Dryden
	Global Hawk	NASA-AFRC	26	1,500	26,750	65,000	335	9,000	http://airbornescience.nasa.gov/aircraft/Global_Hawk
	P-3	NASA-WFF	14	14,700	135,000	32,000	400	3,800	http://airbornescience.nasa.gov/aircraft/P-3_Orion
Other NASA Aircraft	B-200 (UC-12B)	NASA-LARC	5	2,000	13,500	28,000	220	1,000	http://airbornescience.nasa.gov/aircraft/B-200_UC-12B_-_LARC
	B-200	NASA-AFRC	5	1,700	13,420	28,000	270	1,400	http://airbornescience.nasa.gov/aircraft/B-200_-_DFRC
	B-200	NASA-LARC	5	2,000	13,500	28,000	220	1,000	http://airbornescience.nasa.gov/aircraft/B-200_-_LARC
	B-200 King Air	NASA-WFF	6.0	1,800	12,500	28,000	275	1,800	https://airbornescience.nasa.gov/aircraft/B-200_King_Air_-_WFF
	C-130 (2)	NASA-WFF	12	36,500	155,000	33,000	290	3,000	https://airbornescience.nasa.gov/aircraft/C-130_Hercules
	C-23 Sherpa	NASA-WFF	6	7,000	27,100	20,000	190	1,000	http://airbornescience.nasa.gov/aircraft/C-23_Sherpa
	Cessna 206H	NASA-LARC	5	646	3,600	10,000	150	700	http://airbornescience.nasa.gov/aircraft/Cessna_206H
	Cirrus SR22	NASA-LARC	6.1	932	3,400	10,000	175	970	http://airbornescience.nasa.gov/aircraft/Cirrus_Design_SR22
	Dragon Eye	NASA-ARC	<1	1	6	1000	34	3	http://airbornescience.nasa.gov/aircraft/B-200_-_LARC
	Gulfstream III (G-III)	NASA-JSC	7	2,610	69,700	45,000	460	3,400	http://airbornescience.nasa.gov/aircraft/G-III_-_JSC
	HU-25C Falcon	NASA-LARC	4.5	2,000	32,000	36,000	350	1,600	http://airbornescience.nasa.gov/aircraft/HU-25C_Falcon
	Ikhana	NASA-AFRC	20	2,000	10,500	45,000	171	3,000	http://airbornescience.nasa.gov/aircraft/Ikhana
	Learjet 25	NASA-GRC	2	2,000	15,000	45,000	350	1,000	http://airbornescience.nasa.gov/aircraft/Learjet_25
	Learjet 35	NASA-GRC	2.5	4,200	19,600	45,000	350	2,300	
	S-3B Viking	NASA-GRC	6	12,000	52,500	40,000	350	2,300	http://airbornescience.nasa.gov/aircraft/S-3B
	SIERRA	NASA-ARC	10	100	400	12,000	60	600	http://airbornescience.nasa.gov/platforms/aircraft/sierra.html
	T-34C	NASA-GRC	3	100	4,400	25,000	150	500	http://airbornescience.nasa.gov/aircraft/T-34C
	Twin Otter	NASA-GRC	3	3,000	11,000	25,000	140	450	http://airbornescience.nasa.gov/aircraft/Twin_Otter_-_GRC
	UH-1	NASA-WFF	2	3,880	9,040	12,000	108	275	https://airbornescience.nasa.gov/aircraft/UH-1_Huey
	Viking-400 (4)	NASA-ARC	11	100	520	15,000	60	600	https://airbornescience.nasa.gov/aircraft/Viking-400
	WB-57 (3)	NASA-JSC	6.5	8,800	72,000	60,000+	410	2,500	http://airbornescience.nasa.gov/aircraft/WB-57