



National Aeronautics and Space Administration

# Airborne Science Newsletter



Spring 2009

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## In Brief ...

### Global Hawk update

Preparations continue for an initial test flight in mid April. Global Hawk aircraft 872 is in final check-out and ground station flight software is loaded. The new communication system is being exercised and crew training is in progress.

### GFRC supports new sensor test flights

The Glen Lear 25 (NASA 616) flew three February missions supporting the new Swath Imaging Multi-polarization Photon-counting LIDAR (SIMPL). According to Dr David Harding (PI, GSFC), the opportunity to test SIMPL over Lake Erie's analog for sea ice is going to be of tremendous benefit.

### ISRSE update

Preparations continue for the upcoming International Symposium of Remote Sensing of the Environment (ISRSE) in Italy this coming May. NASA and ASP folks are active in the planning of the technical sessions, developing a UAS workshop and demonstration, and presenting many papers and posters.

## NSERC Student Airborne Research Program 2009

This summer, the DC-8 will be used as a hands-on research laboratory for 30 selected advanced undergraduate and early graduate students dedicated to Earth system science research.

The Student Airborne Research Program (SARP) is the first of its kind and will provide students with an opportunity to conduct airborne science using instruments onboard the DC-8. One of these instruments will be the Whole Air Sampler (WAS), which is used by Don Blake and his group at UC Irvine, to take in-situ measurements of the atmosphere over California's Central Valley. This data will be used by the students to interpret how large dairy operations in the area are affecting the atmosphere.

One advantage of the experiment is that it is readily understandable. Students will take samples of ambient air at various locations and



UND student conducting experiment onboard DC-8.

elevations, and then analyze them for chemical content. This allows students to learn airborne science techniques plus subsequent laboratory and data analysis.

*Continued on page 3*

## Operation Ice Bridge

The NASA P-3 out of Wallops Flight Facility, will conduct the first Operation Ice Bridge mission out of Thule Greenland starting on March 30, 2009 and will continue its deployment until May 6th. Instrumentation on the P-3 will include, LVIS (Laser Vegetation Imaging Sensor), ATM (Airborne Topographic Mapper), PARIS (Pathfinder Airborne Radar Ice Sounder), and the University of Kansas Snow Radar.

These instruments are being prepared to integrate onto the aircraft starting March 12th.

The time gap between the end of ICESat-I, which will probably occur this year, and the launch of ICESat-II in the 2014-15 time window creates a data gap in laser observations

of the changes in ice sheets, glaciers and sea ice. For the ice sheets and glaciers, the ICESat laser delivers critical ice thickness data on the properties of the rapidly changing ice streams; for the sea ice, the laser measures ice thickness.

ICESat data over sea ice have successfully been used to retrieve sea ice thickness and to study regional and inter-annual variability. Those results have contributed to a better understanding of the sea ice mass balance and its relation to the changes in the polar climate. It is critical that the laser altimeter time series established by ICESat-I be interrupted as little as possible.



*Continued on page 2*

## High-Winds 09 Update

The High-Winds'09 NASA P-3 flights are in response to the Suborbital Science Flight Request Log Number FR# 9P005. High-Winds'09 flights are testing and validating algorithms aboard the NASA QuickSCAT, ocean surface wind-measurement satellite, using PolSCAT, a legacy Ku-band radiometer. High-Winds'09 is also testing the algorithm development for, and validating/calibrating PALS, an ocean surface salinity L/S-band radiometer, that will be launched on the NASA Aquarius satellite in 2010-2011. Expendable temperature/salinity drop-sonde buoys are deployed during the radiometer data collection flights for the Goddard Space Flight Center to collect temperature/salinity via in-situ measurements. Several GPS receivers are also being flown to conduct environmental conditions studies.

The five instruments being flown aboard the NASA WFF P-3B for the High-Winds mission are as follows:

- Airborne Polarimetric Scatterometer (PolSCAT) - Steven Dinardo, NASA JPL
- Passive/Active L-Band (PALS) - Steven Dinardo, NASA JPL
- Airborne Expendable Conductivity Temperature Depth Probe (AXCTD), Dr. Daniel Jacob, NASA GSFC
- GNSS Instrument System for Multi-static Occultation (GISMOS) – Dr. James Garrison, Perdue University
- GPS Remote Sensing Instrument (GPSRS) – Dr. Michael Grant, NASA Langley Research Center

The P-3 crew deployed from NASA WFF on February 16. To date three data collection flights have been flown for a total of 36.2 of the allocated 50 flight hours. The NASA WFF P-3 flights are based from the Goose Bay, Labrador, Canada Air Base, reaching a study site location approximating 50° N, 40°W. ▲

*Contributed by  
John Valliant*



*Whose idea was this?!? P-3 on snowy taxiway, Goose Bay, Labrador, Canada.*

### Note from the Top



We just completed our annual review here at HQ and the ASP senior staff did an outstanding job briefing the senior SMD, ESD, and focus area leaders. These briefings were very timely as we are putting the final touches on the stimulus funding, getting our final FY09 budget settled, and working out our next multi-year budget planning cycle, the PPBE process. Also, the FY08 Annual Report has been released and it is really a great document showing the breadth of this organization. To get a hard copy see your center lead or contact Matt Fladeland. You can also download a soft copy from <http://airbornescience.nasa.gov>. Kudos to the authors and both Mike Gaunce and Gailynne Bouret for doing such a great job as the editors and chief cat herders. In addition, I was given the opportunity to present our program and how it enables our Earth Science activities to the National Academy of Science's National Research Council (NRC), the group that generates the Decadal Survey and sets our NASA science priorities. The program had recently awarded its second set of Airborne Science Excellence Awards. (See page 3.) Many in our program are worthy of this award: I hope all who deserve it will get their opportunity to receive one.

The ISRSE Conference in Italy is forming into a major event for the international and interagency Airborne Science organizations. We received determination confirmation from our HQ legal staff that four of the programmatic meetings are not conferences so they do not count against the NASA conference limits. The SMD booth will also be added to the events as an EPO non-conference activity. Many of our program personnel will be involved in the conference as organizers, session chairs and presenters (both oral and poster), staffing the ASP booth, and participating in a UAS workshop and demo. We are the world leader for airborne science, gathering once every two years with our international counterparts. As such, we've invested much to insure we don't waste this opportunity for building international coordination among our supporters. Thank you.

*Andy Roberts  
Airborne Science Program Director*

### Ice Bridge (continued from page 1)

The NASA Airborne Science program, in concert with the ICESat program, has stepped up to investigate the Arctic sea ice and the Greenland ice sheet, with NASA's P-3 aircraft to help bridge the data gap between satellites.

The critical areas to be observed and measured with these airborne assets are coastal Greenland, and will include a long leg transit to/from Fairbanks, AK early in the mission for extended sea ice measurements.

Follow on missions relating to Operation Ice Bridge are expected to include:

Punta Areas, Chile, as well as, Christchurch, New Zealand as the best possible choices to complete the data set for the ICESat community. Aircraft will fly 4-5 flights to the appropriate areas from each location October/November, 2009-2014, as well as the, March, 2010-2014 time frame.

More information can be found on the Operation ICE Bridge web site: <http://www.espo.nasa.gov/oib>. ▲

*Contributed by  
Kent Shiffer*



## 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
Core Aircraft	ER-2	NASA-DFRC	12	2,900	40,000	>70,000	410	>5,000	<a href="http://www.nasa.gov/centers/dryden/research/AirSci/ER-2/">http://www.nasa.gov/centers/dryden/research/AirSci/ER-2/</a>
	WB-57	NASA-JSC	6	6,000	63,000	65,000	410	2,172	<a href="http://jsc-aircraft-ops.jsc.nasa.gov/wb57/">http://jsc-aircraft-ops.jsc.nasa.gov/wb57/</a>
	DC-8	NASA-DFRC	12	30,000	340,000	41,000	450	5,400	<a href="http://www.nasa.gov/centers/dryden/research/AirSci/DC-8/">http://www.nasa.gov/centers/dryden/research/AirSci/DC-8/</a>
	P-3B	NASA-WFF	12	16,000	135,000	30,000	330	3,800	<a href="http://wacop/wff.nasa.gov">http://wacop/wff.nasa.gov</a>
NASA Catalog Aircraft	DHC-6 Twin Otter	NASA-GSFS-WFF	7	5,000	12,000	25,000	160	500	<a href="http://www.twinotter.com">http://www.twinotter.com</a>
	Gulfstream III (G-III) (mil: C-20A)	NASA-DFRC	7	2,610	45,000	45,000	459	3,400	<a href="http://airbornescience.nasa.gov/platforms/aircraft/g3.html">http://airbornescience.nasa.gov/platforms/aircraft/g3.html</a>
	King Air B-200 AND UC-12B	NASA-LARC	6.2	4,100	12,500	35,000	260	1250	<a href="http://airbornescience.nasa.gov/platforms/aircraft/b-200.html">http://airbornescience.nasa.gov/platforms/aircraft/b-200.html</a>
	DHC-6 Twin Otter	NASA-GRC	3.5	3,600	11,000	25,000	140	450	<a href="http://www.grc.nasa.gov/WWW/AircraftOps/">http://www.grc.nasa.gov/WWW/AircraftOps/</a>
	Learjet 25	NASA-GRC	3	3,200	15,000	45,000	350/.81 Mach	1,200	<a href="http://www.grc.nasa.gov/WWW/AircraftOps/">http://www.grc.nasa.gov/WWW/AircraftOps/</a>
	S-3B Viking	NASA/GRC	>6	12,000	52,500	40,000	450	2,300	<a href="http://www.grc.nasa.gov/WWW/AircraftOps/">http://www.grc.nasa.gov/WWW/AircraftOps/</a>
UAS	Global Hawk	NASA-DFRC	31	1500	25,600	65,000	335	11,000	<a href="http://airbornescience.nasa.gov/platforms/aircraft/globalhawk.html">http://airbornescience.nasa.gov/platforms/aircraft/globalhawk.html</a>
	Ikhana (Predator-B)	NASA-DFRC	30	3,000	10,000	52,000	171	3,500	<a href="http://airbornescience.nasa.gov/platforms/aircraft/predator-b.html">http://airbornescience.nasa.gov/platforms/aircraft/predator-b.html</a>
	SIERRA	NASA-ARC	11	100	445	12,000	60	550	<a href="http://airbornescience.nasa.gov/platforms/aircraft/sierra.html">http://airbornescience.nasa.gov/platforms/aircraft/sierra.html</a>

## ASP Upcoming Events

\* ARM 2009 Science Team Meeting  
March 30 - April 2, 2009  
Louisville, KY  
<http://stm.arm.gov>

/  
\* AIAA Unmanned Unlimited & Infotech@Aerospace  
April 6-9, 2009; Seattle, WA  
[http://aiaa.org/content.cfm?pageid=230&lu\\_meetingid=2070](http://aiaa.org/content.cfm?pageid=230&lu_meetingid=2070)

Meetings accepting abstracts:

\* Geospatial 09  
Forest Service GIS Conference  
Snowbird Conference Ctr., UT  
April 27-May 1, 2009  
Abstracts accepted until Jan. 30, 2009  
<http://fsgeodata.fs.fed.us/geoconference/>

\* 33rd International Symposium on Remote Sensing of Environment (ISRSE)  
Stresa, Italy  
May 4-9, 2009;

<http://www.symposia.org/>  
Hotel booking: [http://www.stresacongressi.it/it/download\\_registrati.php](http://www.stresacongressi.it/it/download_registrati.php)

\* AGU Spring Meeting: 2009 Joint Assembly  
The Meeting of the Americas  
May 24-27, 2009  
Toronto, Ontario, Canada  
<http://www.agu.org/meetings/ja09/>

\* UAS 2009  
11th Intl. Conference & Exhibition  
Paris, France  
June 9-11, 2009  
[www.uas2009.org](http://www.uas2009.org)  
Abstracts accepted until Jan. 31, 2009

\* AUVERSI North America  
Washington Convention Center  
Washington, D.C.  
Aug. 10-13, 2009  
Abstracts accepted through Jan. 9, 2009  
<http://symposium.auvsi.org/show/callforpapers.php>

## Airborne Science Newsletter

It's your newsletter!

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

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