



**National Aeronautics and Space Administration
Science Mission Directorate**

Airborne Science Program

**ICCAGRA
May 10, 2011
Monthly**

- Flew 3 GH dropsonde science flights for NOAA
 - 2 missions dropped 70 sondes each, most dropped from an aircraft in a single mission
- Flew Glory telemetry mission with DC-8





Global Hawk Update



- Block 10 Global Hawks arrive Dryden Flight Research Center early April 2011
- Global Hawk Mobile Operations Facility in work – ECD September 2011
- Investigating options for an east coast facility
- Preparing for KQ-X



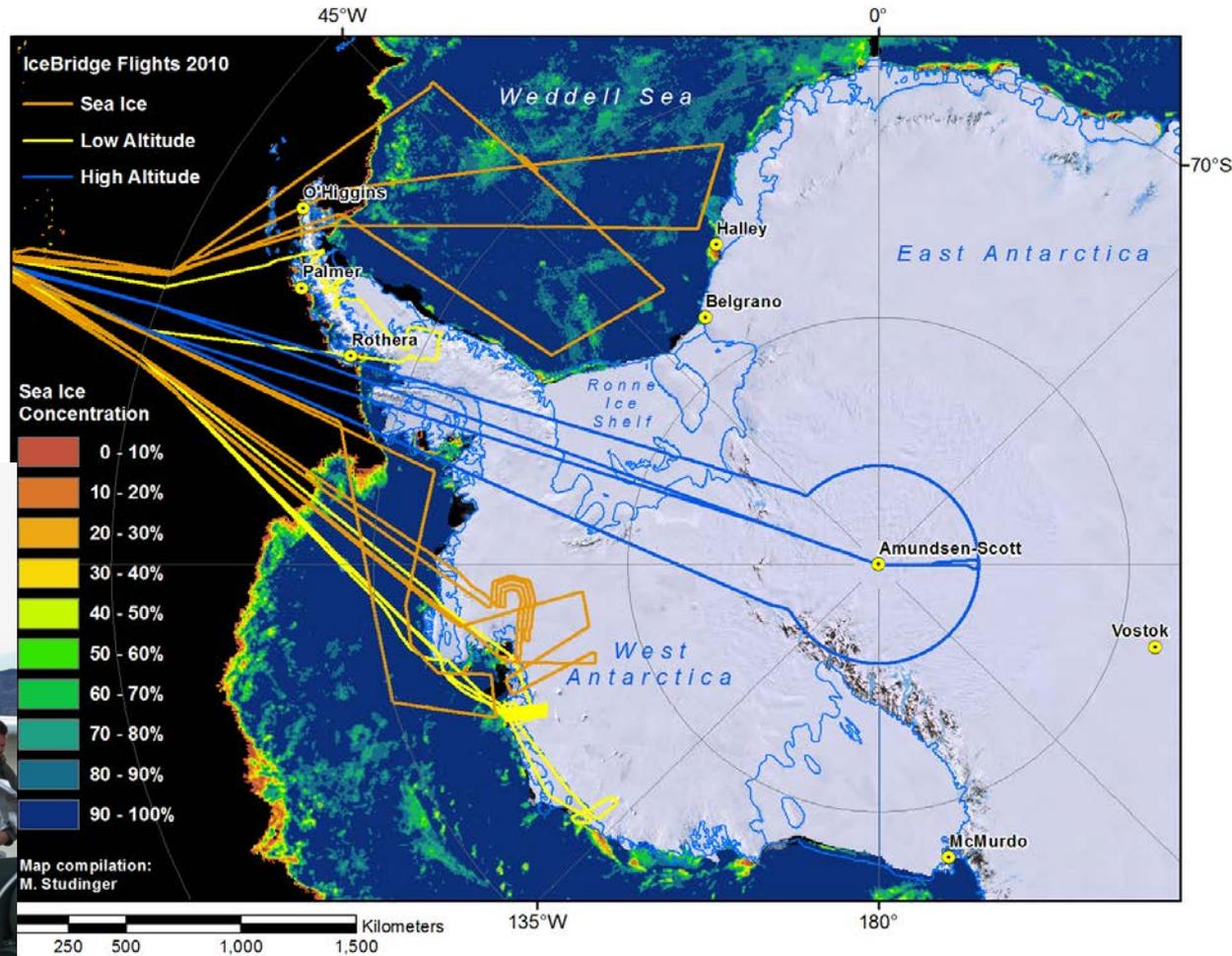
Operation IceBridge Antarctica 2010



Completed Operation IceBridge Antarctica 2010. DC-8 flew 10 science flights, totaling 115.5 hours and covering 40,098 nautical miles (2x the Earth's circumference). The arc at 86 degrees was completed meaning every ICESat orbit has been underflown.

MABEL, photon-counting lidar, completed 5 initial engineering check flights on ER-2 for ICESat 2 technology demonstration.

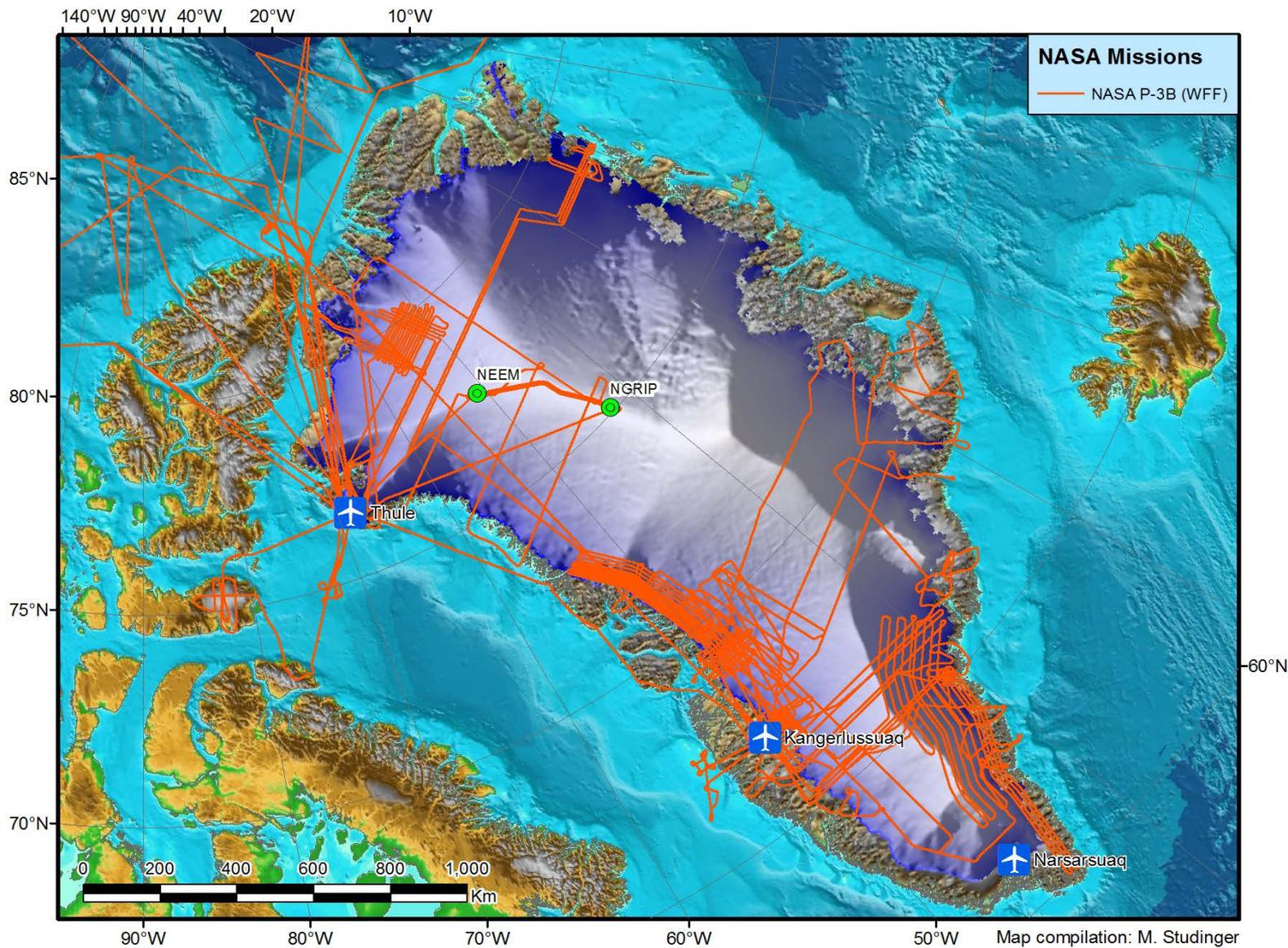
MABEL installed in ER-2 nose while technicians service aircraft





Operation IceBridge 2011

P-3B Science Flights





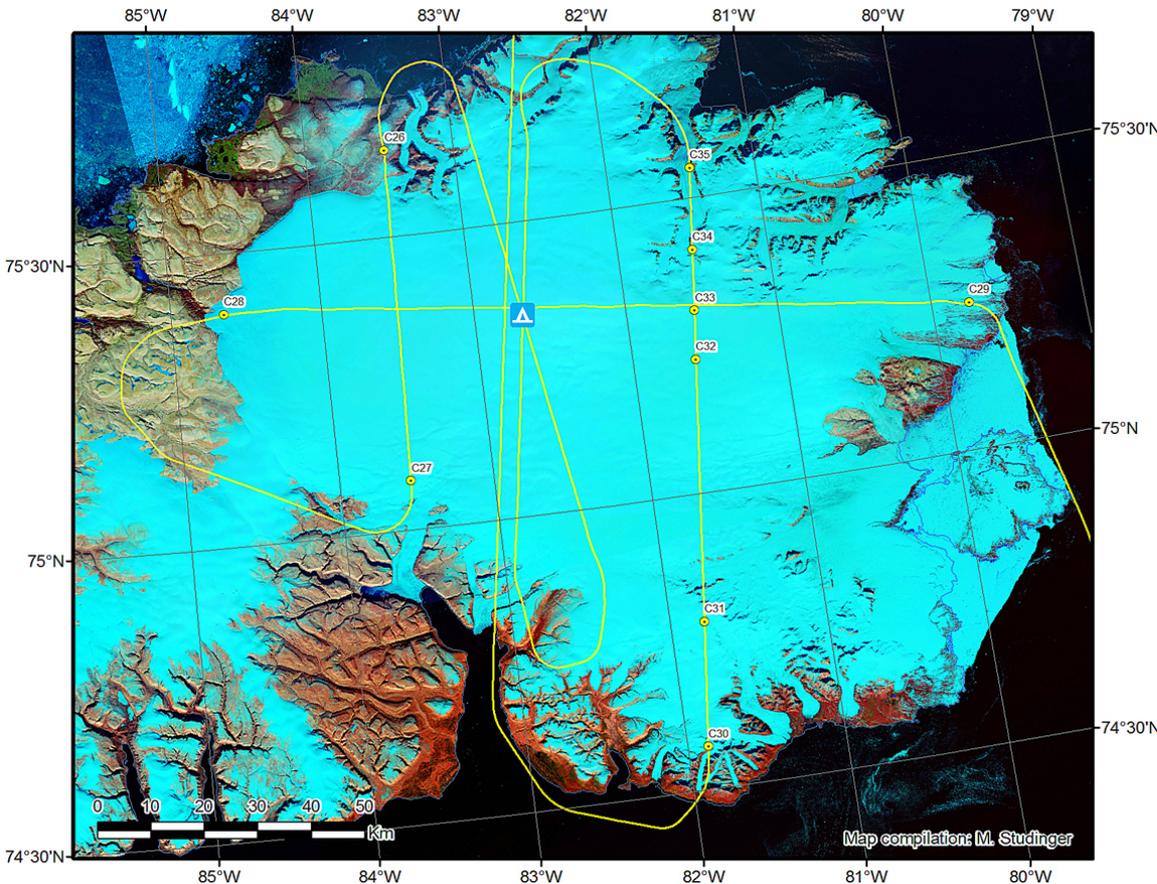
Flight 32 – Devon Island – May 5 ESA's CryoVEx 2011 Campaign

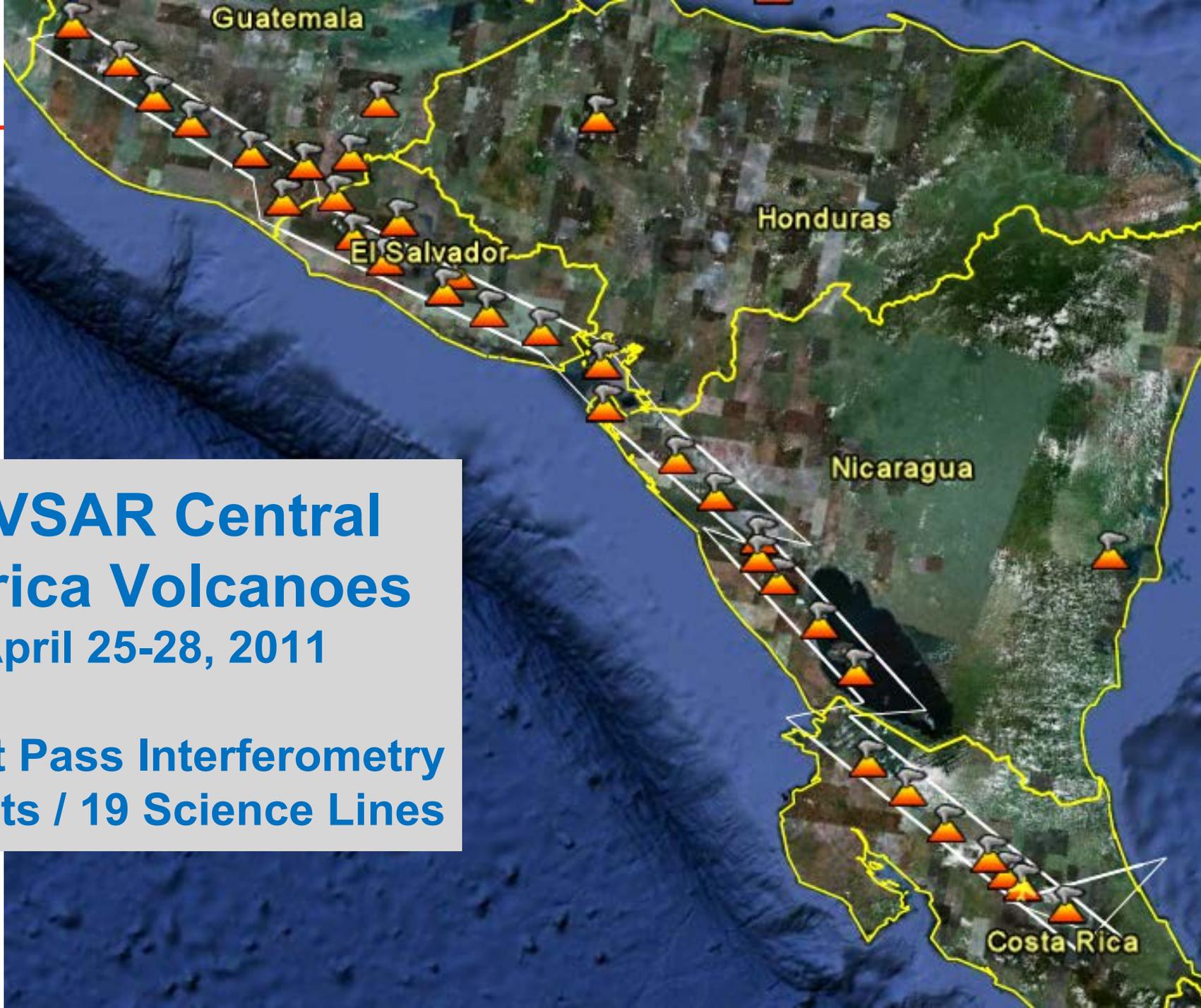


CryoVEx on Devon Ice Cap

The goals of the CryoVEx experiment on Devon Island are to assess the accuracy of surface elevations derived from CryoSat-2 L2 data: to assess the potential for CryoSat-2 data to be used for mapping snow accumulation over ice caps across the Queen Elizabeth Islands and to relate CryoSat-2 waveforms to surface and near-surface conditions on the ice cap.

In order to do this it is necessary to continue measurements along the original CryoSat cal/val transect (ASIRAS Line 623) to maintain measurements of long-term thickness changes that began in 2004.





UAVSAR Central America Volcanoes

April 25-28, 2011

Repeat Pass Interferometry
3 Flights / 19 Science Lines

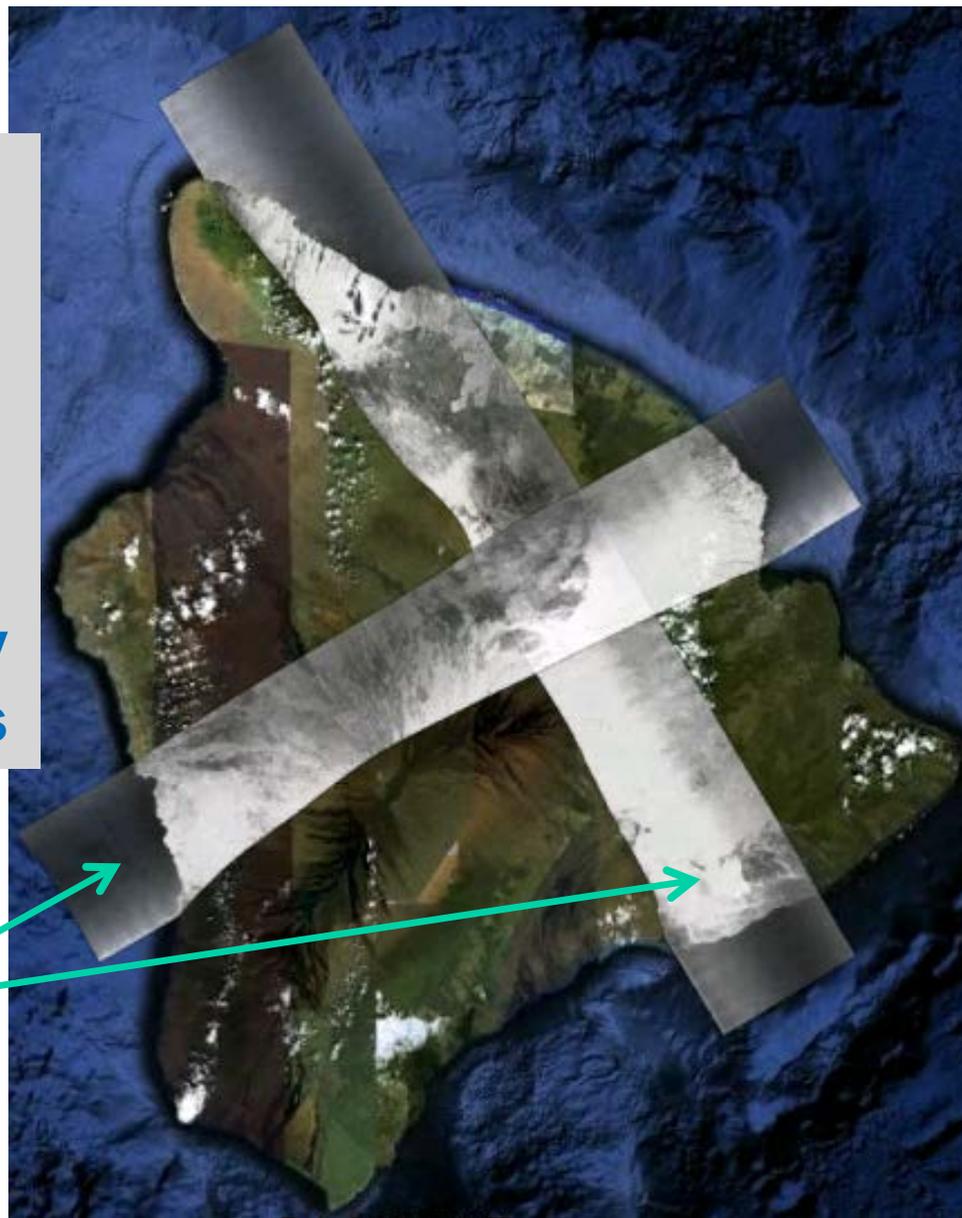


UAVSAR Hawaii Big Island Volcanoes

May 2-10, 2011

Repeat Pass Interferometry
5 Flights / 74 Science Lines

2 of 16 on-board processed
images from UAVSAR flight on
May 5, 2011





Earth Venture-1 Summaries



Airborne Microwave Observatory of Subcanopy and Subsurface (AirMOSS) - Univ Mich/JPL

North American ecosystems are critical components of the global exchange of the greenhouse gas carbon dioxide and other gases within the atmosphere. To better understand the size of this exchange on a continental scale, this investigation addresses the uncertainties in existing estimates by measuring soil moisture in the root zone of representative regions of major North American ecosystems. Investigators will use NASA's Gulfstream-III aircraft to fly synthetic aperture radar that can penetrate vegetation and soil to depths of several feet.

Airborne Tropical Tropopause Experiment (ATTREX) - ARC

Water vapor in the stratosphere has a large impact on Earth's climate, the ozone layer and how much solar energy the Earth retains. To improve our understanding of the processes that control the flow of atmospheric gases into this region, investigators will launch four airborne campaigns with NASA's Global Hawk remotely piloted aerial systems. The flights will study chemical and physical processes at different times of year from bases in California, Guam, Hawaii and Australia.

Carbon in Arctic Reservoirs Vulnerability Experiment (CARVE) - JPL

This investigation will collect an integrated set of data that will provide unprecedented experimental insights into Arctic carbon cycling, especially the release of the important greenhouse gases such as carbon dioxide and methane. Instruments will be flown on a Twin Otter aircraft to produce the first simultaneous measurements of surface characteristics that control carbon emissions and key atmospheric gases.

Deriving Information on Surface Conditions from COLUMN and VERTICALLY Resolved Observations Relevant to Air Quality (DISCOVER-AQ) - LaRC

The overarching objective of the DISCOVER-AQ investigation is to improve the interpretation of satellite observations to diagnose near-surface conditions relating to air quality. NASA's B-200 and P-3B research aircraft will fly together to sample a column of the atmosphere over instrumented ground stations.

Hurricane and Severe Storm Sentinel (HS3) - GSFC/ARC

The prediction of the intensity of hurricanes is not as reliable as predictions of the location of hurricane landfall, in large part because of our poor understanding of the processes involved in intensity change. This investigation focuses on studying hurricanes in the Atlantic Ocean basin using two NASA Global Hawks flying high above the storms for up to 30 hours. The Hawks will deploy from NASA's Wallops Flight Facility in Virginia during the 2012-14 Atlantic hurricane seasons.

Green are in implementation; Blue are in development

Student Airborne Research Program (SARP 2011)

SARP 2011 Research Topics

Evapotranspiration of almond orchards and vineyards, Central Valley

Dr. Susan Ustin, UC Davis

Air quality effects of commercial dairy operations and urban air pollution, Central Valley, CA & Los Angeles

Dr. Don Blake, UC Irvine

Kelp growth and biomass, Santa Barbara Channel & Monterey Bay

Dr. Raphael Kudela, UC Santa Cruz



85 Applications for admission, **30** admitted

Student Profile: **14 Female/16 Male**

Average GPA: **3.62**

Academic Disciplines:

Earth & Environmental Science **30%**

Biology, Chemistry & Physics **44%**

Meteorology & Atmospheric Science **13%**

Engineering & Mathematics **13%**



DC-8 will be used for two 6-hour data flights

Instruments to be employed are:

MASTER for remote sensing of kelp and agricultural processes

Whole Air Sampler (WAS) for in situ gas sampling

Digital Mapping System (DMS) for multi-angle imaging

29 Universities in 21 states (in blue above)

6 week program: 6/19/2011-7/29/2011

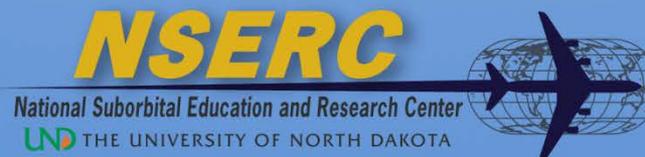
The program concludes with the students presenting their research results in formal presentations

In addition, the top 3 student presentations will be given at the NASA booth during the 2011 Fall AGU meeting in San Francisco

SARP 2011 on Facebook: [facebook.com/nserc.sarp2011](https://www.facebook.com/nserc.sarp2011)

SARP 2011 on Twitter: twitter.com/sarp2011

All of the lectures and student presentations will be videotaped and available on the internet



For more information please visit

<http://www.nserc.und.edu/learning/SARP2011.html>



NASA SMD ESD Airborne Science Program 6-month Schedule



FY11		Mar	Apr	May	Jun	Jul	Aug	
ER2	806	ICE Ax	Mnt.	HYWRAP, CoSSIR & AMPR		AVIRIS, LAC, MASTER, RSP & NAST-I		
	809	Reimbursable		Reimbursable, AVIRIS & MASTER		Maintenance		
GIII	30502	Maint.	Various UAVSAR Flights (Costa Rica, San Andreas, Gulf of Mexico, Cascades/AK)					
GH	871	Mods for science	APCS	HS3 Integration	Reimbursable Mods			
	872	HS3/ATTREX	UAVSAR pods	Reimbursable Mods			HS3 Int.	HS3 Test Flts
	873	Non-flyable Storage						
P-3	426	OIB Int.	OIB - Arctic Deployment		DISCOVER-AQ	DISCOVER-AQ		
DC-8	817	SweepSAR	IIP		SARP	ASCENDS II		
WB-57	926	Maint.	MACPEX	Reimbursable Int.		Reimbursable Flight Missions		
	928	Reimbursable Flight Missions						



Other Events



- **Major Upcoming Events/Meetings/Reviews:**
 - **Mar 11 – UAS Enabled Science proposals due – 35 received**
 - **Science panel review June 1-3; announcement by July**
 - **Mar/Apr – MACPEX – WB-57 – missions over SGP DOE Site**
 - **Mar/Apr – AAFEX – DC-8 – Synthetic fuels test**
 - **Apr/May – MC3E – ER-2 – based at Offutt AFB**
 - **Apr/May – AIDS for ASCENDS – B200 – Langley**
 - **May – IIP/Broadband Lidar – DC-8 - Palmdale**
 - **Oct/Nov – OIB Antarctica 2011**