

# NSF Airborne Status: ICCAGRA, NRL April 6-7, 2010 Stephan Nelson (James Huning/Bernard Grant)

C-130Q



NRL P-3 and ELDORA Radar



CIRPAS T-O



Wyoming King Air



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A-10 SPA  
In progress



Gulfstream V



LC-130 Ski 4 operational



# NSF Flight Hours: Polar Programs, NCAR Operations, and University of Wyoming FY 2009

- Office of Polar Program (Antarctic Fly in is over 4 months only Oct-Feb)
- Beginning in 1998 and after 42 years the ANG 109<sup>th</sup> (NY) replaced the Navy's VX6 to support operations in Antarctica and the Arctic
- 2009 flight hours for Fixed Wing and Rotorcraft:
  - Twin Otters (2, KBA): 950
  - DC-3 (Bassler, KBA): 336
  - AS350B (Helo 2, PHI, Inc.) 466
  - Bell212 (2, PHI, Inc.): 654
- LC 130s (4): lots ANG 1,134
- UAS Aerosonde (1): 130
- UAS CReSIS (U Kansas) test hours only
  
- **Subtotal Flight Hours: 3,670**
  
- OPP also uses CAS: Australia (A318), NZ (C-130s, 757)
  
- NCAR has been an FFRDC since 1961
- NCAR operations of GV: 230
- NCAR operations of C-130Q: 171 (major inspection; was out of service)
  
- University of Wyoming King Air: 111 (over 15 years of service to NSF)
  
- **Grand Total NSF Flight Hours: 4,182**



# NSF Sponsored Lower Atmospheric Observing Facilities

- NCAR Operated and Maintained
  - Budget for maintenance, flight crews, hangar are part of overall budget provided to NCAR (FFRDC) by NSF
  - Deployment Pool is approximately \$6M but that supports all National Facilities supported by NSF, not just aircraft.
  - OPP budget is separate and coupled with all of the logistics funding.
- King Air supported through Cooperative Agreements at the University of Wyoming (King Air) and an MOA is in progress to use the CIRPAS Twin Otter at the Naval Post Graduate School
- NRL P-3B integrated with ELDORA and supported through an MOA for approved ELDORA field campaigns
- Interagency and International Facilities
  - Campaigns conducted in collaboration with interagency partners, e.g., NOAA, NASA, NRL, DOE, and EUFAR members



# NSF C-130Q

Highly modified, re-engined  
medium altitude, large payload  
platform



Avionics upgrade contract signed (ARRA funding), ASB Avionics, Mojave, CA.

Will install electronic propeller controls after completion of avionics upgrade.



G-V continues in the major science missions, **HIPPO** (HIAPER Pole-to-Pole). **PREDICT** will be conducted out of St Croix this summer. Its objective is to better understand the process of tropical depression formation that result in tropical cyclones.



Wing pods now FAA certified; G-V  
Successfully reached FL51 with pods



# Proposed Field Campaigns for Balance of 2010 and into 2011/12

**ADELE II & III** G-V 88 hours Melbourne Florida- Airborne detector for Energetic Lightning Emissions

**IDEAS IV** G-V 30 hours, C-130 25 hours, KA 28 hours 25 hours, new instrument development and education RMMA, Laramie and marine location Request

**NAAMEX** – C-130 152 hours, western and eastern USA locations North American Airborne Mercury Experiment

**PREAMBLE** – King Air (hours TBD, 2011) Precision Atmospheric Marine Boundary Layer Experiment, California

**SAANGRIA** – G-V (estimate 300 hours) Southern Andes-Antarctic Gravity Wave Initiative, Chile (In evaluation for 2011/2012 deployment)

**SPRITES 2** – G-V (34 hours), RMMA

**TORERO** - G-V (140 hours) Tropical Ocean Troposphere Exchange of Reactive Halogen Species and Oxygenated VOC, Ecuador (2012 deployment)



# 2010 Planning Chart

2010 Planning Chart													
NCAR / EOL Research Aviation Facility													
Aircraft	Project Location PI	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>C130</b>													
Approved AJ / JBJ	PLOWS (US Mid-west) Rauber	1 15	28	1 10 20									
Request	Intercompare (France) EUFAR / NSF										2 20 31	10	
Approved	WAMO (JeffCO) Jaffe et al									1	1 15 22		
	Maintenance Schedule (JeffCO)			PKG 1		avionics → upgrade	PKG 2	avionics → upgrade	avionics → upgrade	PKG 3		PKG 4	
<b>GV</b>													
Approved PR	HIPPO (Global) Wofsy			1 22 31	15 22	1							
Approved JBJ / AJS	PREDICT (St Croix) Davis						24	1 15 31	30	10			
required	HEFT - 4 "HSRL" (JeffCO)	1 22 31	1 15 22										
Approved	AMAX-DOAS (JeffCO) Volkamer	linked to	HEFT-4										
	Maintenance Schedule (JeffCO)				48 Month Inspection (JeffCO)	Gear Inspection (GAC) 1 - 30	96 Month Inspection (JeffCO)	→			24 Month & ANNUAL (6 weeks)	→	→
<b>P3</b>													



# Federal Aircraft Issues

- The NSF G-V and C-130 aircraft
  - These aircraft operate as Public Use in the United States, and did operate as State aircraft internationally but now have concern that EUROCONTROL may not *recognize research aircraft as State aircraft*. DOS is negotiating this issue, one that could impact on international campaigns
    - EUROCONTROL: "...with reference to article 3(b) of the Chicago Convention, only aircraft used in military, customs and police services shall qualify as State Aircraft....Civil registered aircraft used by a State or other than military, customs and police services shall not qualify as State Aircraft."
    - G-V is fully certified and so will not be a major issue
  - SMS: IS-BAO has been approved by ICAO to certify SMS (FAA will not do so for Part 91 operations)
    - Eliminates a potential major issue
    - GSA ICAP is supporting, through funding this activity for ICAP members
    - IS-BAO: International Standards-Business Aviation Organization
- LC-130 aircraft maintained and operated by the NY ANG 109<sup>th</sup> Airlift Wing for the Office of Polar Programs (Antarctica and Greenland). As military operated aircraft they are not managed per FMR 102-33
- The University of Wyoming King Air is a state owned aircraft, operates under Part 91
  - Wyoming completed IS-BAO certification process for SMS



# Federal Aircraft Issues

- ICAP (Interagency Committee on Aviation Policy, established by OMB) completed a re-write of Advisory Circular 00-1.1.B Determination of *Public (Government) Aircraft Operations*
  - Currently in review by FAA General Counsel
  - As noted in the AC: The designation “public aircraft” does not extend to international airspace. An aircraft without an airworthiness certificate (“public aircraft”) cannot be operated outside the United States unless it has been defined as a state aircraft per AC 20-132, Public Aircraft, paragraph 3.c.
  - Federal agencies that had previously operated research aircraft as State a/c will be represented by DOS and argue the case that these a/c are State (3/18/10 meeting)
    - ***Stay tuned***



University of Wyoming King Air  
State Owned – NSF Funded

Will be participating in several research campaigns in 2010  
Wyoming Cloud Radar and Cloud Lidar included in the Cooperative  
Agreement



# LC 130 Ski Plane

## NSF has 4 Operational and 4 in Storage



**NP2000 8 bladed propellers and electronic propeller controls – in testing**  
**Advantage: more thrust, some fuel savings, much less vibration (crew and instruments), low maintenance**



# A-10 Storm Penetration Aircraft; CIRPAS Twin Otter, and NRL P-3 with ELDORA Radar



A-10 Transfer from USAF  
To USN, NPS CIRPAS



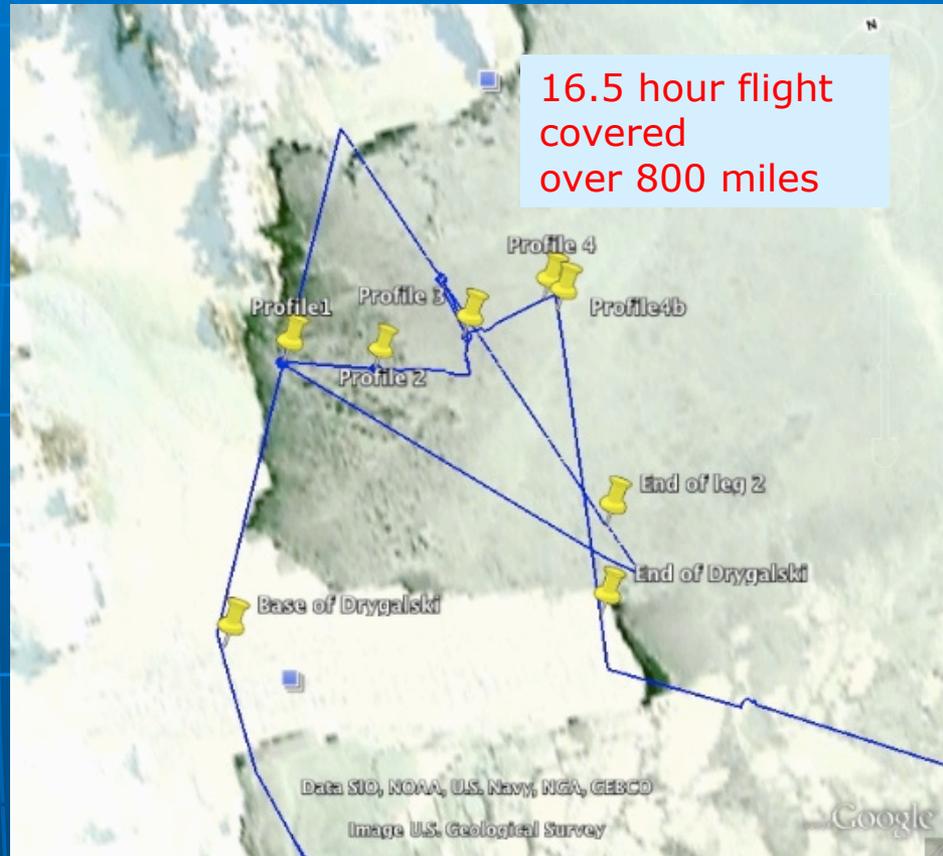
CIRPAS Twin Otter; to augment  
C-130Q and GV where appropriate



NSF and NRL MOA through  
2012 for ELDORA operations



## Aerosonde in Antarctica: 130 hours in 2009



NSF, and other agencies, have used UAS platforms to acquire critical research data (e.g., Alaska, Maldives, Galapagos, Antarctica) and NSF will continue to expand their use. Most recent and extensive use is in Antarctica by the Office of Polar Programs.



# Summary

- Federal Civilian aircraft operations are going through a significant re-evaluation
  - Rewrite of Advisory Circular AC No. 00-1.1B Determination of Public Aircraft (as mentioned earlier)
  - Re-write of FMR 102-33 (Management of Government Aircraft). 108 recommended changes were submitted and 86 were incorporated into the new draft. In legal review now.
  - Approved SMS in place by 18 November 2010
  - DOS agreed to take the leadership role to argue applicability of research aircraft as State aircraft to international organizations (one voice rather than 4 or 5 separate ones).

