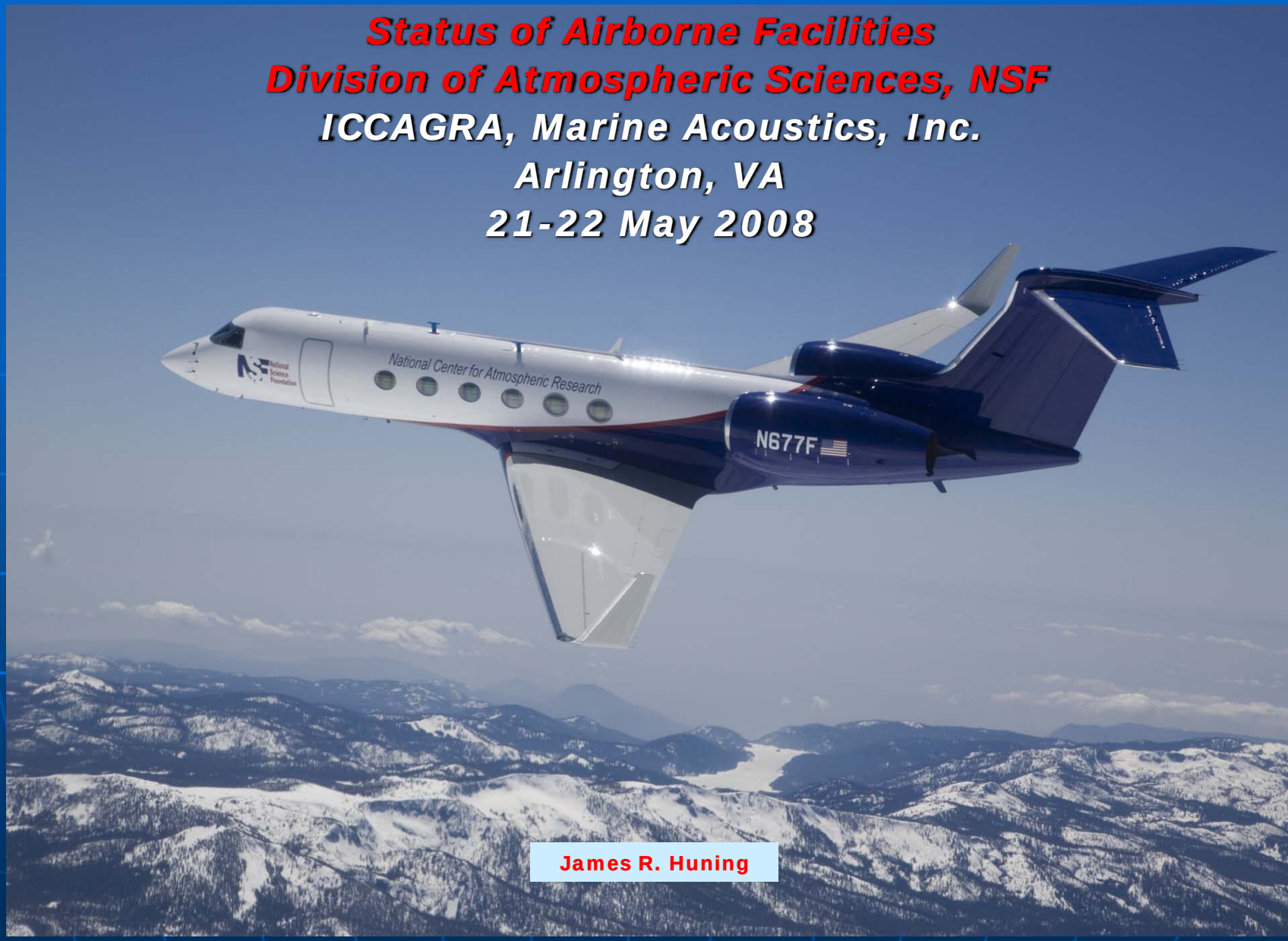
Status of Airborne Facilities
Division of Atmospheric Sciences, NSF

ICCAGRA, Marine Acoustics, Inc.
Arlington, VA
21-22 May 2008



James R. Huning

NSF Sponsored Lower Atmospheric Observing Facilities

- NCAR Operated and Maintained
  - Ground based sounding systems
  - Deployable radars
  - Airborne instrument/sounding systems
  - Research aircraft – federally owned civilian (restrictions)
- Aircraft supported through Cooperative Agreements at a University
- Interagency and International Facilities
  - E.g., NOAA, NASA, NRL, CNES, DLR

NSF has two Separate Programs that own Federal Aircraft

- The G-V and C-130 aircraft operated and maintained by the National Center for Atmospheric Research (NCAR), a NSF FFRDC, for the Division of Atmospheric Sciences
- LC-130 aircraft maintained and operated by the NY ANG 109th Airlift Wing (military tail numbers) for the Office of Polar Programs (Dr. Peter Milne will describe)

Airborne Platforms

- Most expensive of the facilities to deploy (entire deployment pool funding is on the order of $5M per year)
- Typical deployment (2-8 weeks) requires $100K – 2.5M
- Observing Facilities Assessment Panel (OFAP) meets semi-annually to provide guidance on experimental design (flight hours, proper suite of instruments, as well as other facilities)
- Will be applying for the ICAP Gold Standard in Aviation
  - Voluntary self certification program by individual civilian agencies
  - ARMS (Aircraft Resource Management Survey) required
  - Agencies committed to Federal aviation safety by implementing and actively supporting the ICAP Safety Standards Agreement, the Guidelines, and adhering to FMR Part 102.33

NSF LC-130 ski plane

GV on its first science mission:
T-REX
Followed by the very successful
PACDEX (Pacific Dust) mission, GISMOS (GPS Multistatic and Occultation Instrument for Atmospheric, Oceanographic and Land Remote Sensing, and now initiating START-08 (Strat-Topo Analyses of Regional Transport) and HIPPO (HIAPER Pole to Pole)

GPS Dropsonde

Deployment an issue over land and congested air routes

ICAO involvement

NRL P-3 and ELDORA

A new MOU between NSF and
NRL to provide platform support until 2012 just approved by NSF and NRL – will support T-PARC in August-September 2008

NSF sold its Electra (end of useful life) and modified the NRL P-3 to carry the large Eldora Radar

University of Wyoming King Air State Owned – NSF Funded

A-10: A possible replacement for T-28

Engineering evaluation by Zviko, Inc.

NSF C-130Q


Highly modified, re-engined medium altitude, large payload platform
Working to fund an avionics modernizations program for the aircraft; estimated cost 5.5M

NP2000 Propeller System

UASs

- Unpiloted Aerial Vehicle Systems will play an increasing role in ATM's research programs
- NSF will leverage its partner agencies (NASA, NOAA, DOE, DOD) to maximize return on investments
- NSF, and other agencies, have used UAS platforms to acquire critical research data (e.g., Alaska, Maldives, Galapagos) and NSF will continue to expand their use
- Will be participating in the NASA/FAA workshop at NASA 3-5 June

NSF ATM's Support of Observational Science

- ATM provides a variety of observational tools to support NSF approved science proposals, and makes the facilities accessible to other agency PIs
- The cost of the deployment of the facilities is at no cost to the PI
- Approximately $5M per year is allocated for the deployments (this is separate from funds for the science proposals)
- Most facilities are operated and maintained by NCAR, but several are maintained and operated by the university community as national facilities under cooperative agreements
- A major facilities assessment has been completed, but it is a living document and will be periodically updated
  http://www.eol.ucar.edu/dir_off/FacAssess/NSF%20Facilities%20Assessment%20Final%20Report.pdf
- Increased interagency and international cooperation is planned (which will require a new paradigm for allocation of facilities)

Upcoming NSF Airborne Programs

- VOCALS – VAMOS (*Variability of the American Monsoon Systems*) Ocean-Cloud-Atmosphere-Land Study Regional Experiment; Chile, Oct-Nov 2008
- C-130, CIRPAS Twin Otter, DOE G-1, UK Met Office BAe-146
- Extensive Ground Instrumentation and Ship Support (UNOLS and Peruvian ship)

Upcoming NSF Airborne Programs

- CLDGPS – Cloud Perturbations using Differential GPS
- Wyoming King Air used to demonstrate that differential GPS position measurements from the KA can be used to measure the horizontal pressure perturbations associated with convective clouds.
- Currently in progress at KA home base, Laramie, WY

Upcoming NSF Airborne Programs

- ADELE – Wyoming King will be used to test a an instrument being developed under NSF's MRI (Major Research Instrumentation) program. ADELE, the Airborne Detector for Energetic Lightning Emissions, is designed to study x-ray and gamma-ray emissions related to thunderstorms.
- Instrument test at Laramie, deployment in Florida
- In Review at this time

Upcoming NSF Airborne Programs

- T-PARC – *THORPEX* (THe Observing System Research and Predictability EXperiment) Pacific Asian Regional Campaign – will be conducted August-September 2008
- T-PARC is designed to leverage multi-national efforts to address short range dynamics and forecast skills of one region and how that impacts medium range dynamics and forecast skills downstream regions.
- Primary facilities include: NRL-P3/ELDORA; DLR Falcon 20 (dropsonde); driftsonde; Chinese dropsonde aircraft; Japanese G-II

Upcoming NSF Airborne Program

POST - Physics of Stratocumulus Tops

CIRPAS Twin Otter – Monterey, CA

July-August

Concluding Remarks

- NSF sponsors a number of research facilities that are available to an NSF funded PI(s) at no cost to deploy (worldwide)
- Deployment supports NSF funded science proposals (all sciences eligible)
- Facilities available to other agencies at reimbursable cost and non-interference basis
- Facilities mix is changing in response to science initiatives and on-going facilities assessment
- *Planning charts and "how to request facilities" are on line on new NCAR/EOL web site (http://www.eol.ucar.edu/about/our-organization/fps)*