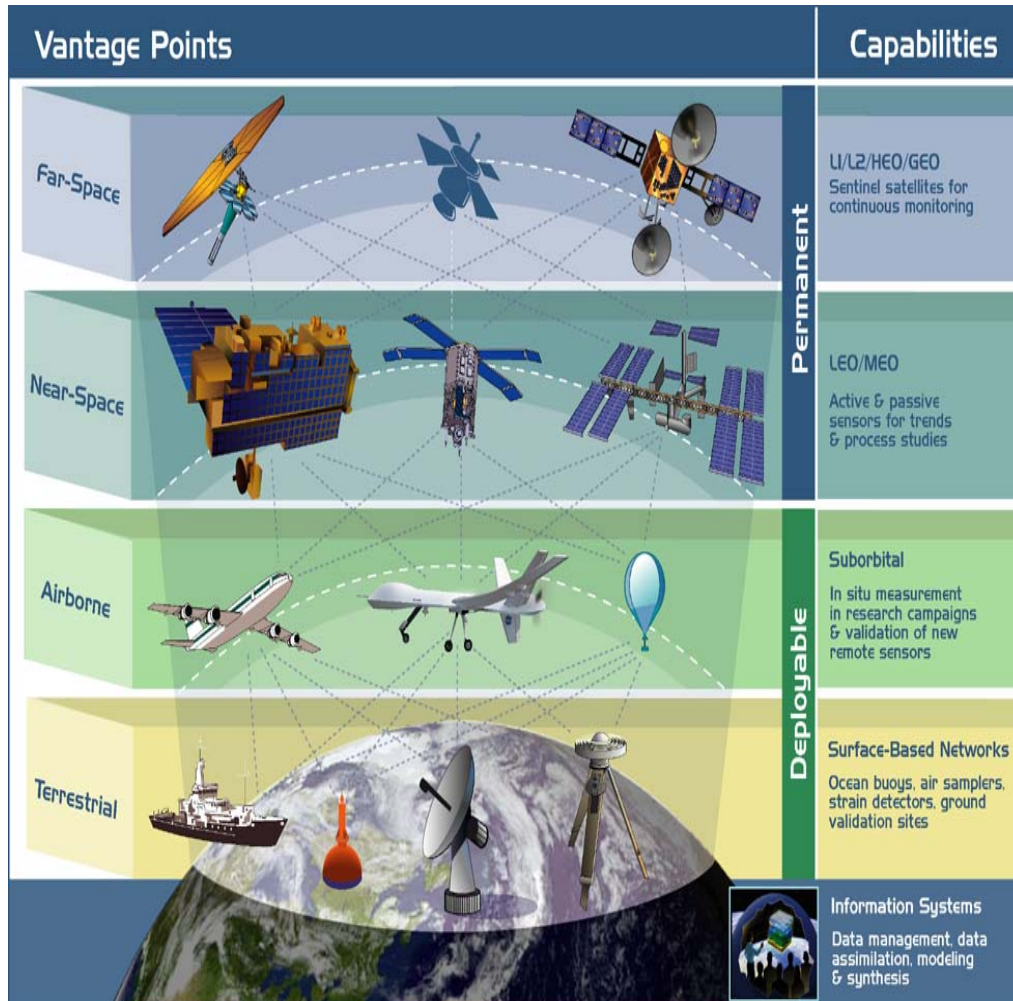




Airborne Science Program



Program Objectives:

Satellite Calibration and Validation

Provide best value methods to perform the cal/val requirements for Earth Observing System satellites

New Sensor and Algorithm Development

Provide best value methods to reduce risk for new sensor concepts and algorithm development prior to committing sensors to spacecraft

Process Studies

Facilitate best value to acquire high spatial/temporal resolution focused measurements that are required to understand small atmospheric and surface structures which generate powerful Earth system effects.

Next Generation NASA Scientist and Engineer Development

Facilitate the development of our future NASA workforce by maturing our PI's, Project Scientist, Instrument Engineers, science management. Airborne programs typically last 12 to 24 months and as compared to satellite going years to decades on one project.



2005-2007 Airborne Campaigns





Airborne Science Program Operations

Core Airborne Systems:
ER-2, WB-57, DC-8, P-3



New Technology Airborne Systems
Ikhana, Global Hawk, Sierra, G-III



Catalog Airborne Systems (Utilized)

B-200 (LaRC, DOE, etc), S-3 (GRC), Learjet (GRC), Twin Otter, Caravan, Aerosonde, etc



Airborne Sensor Facility, Mission/Campaign Management

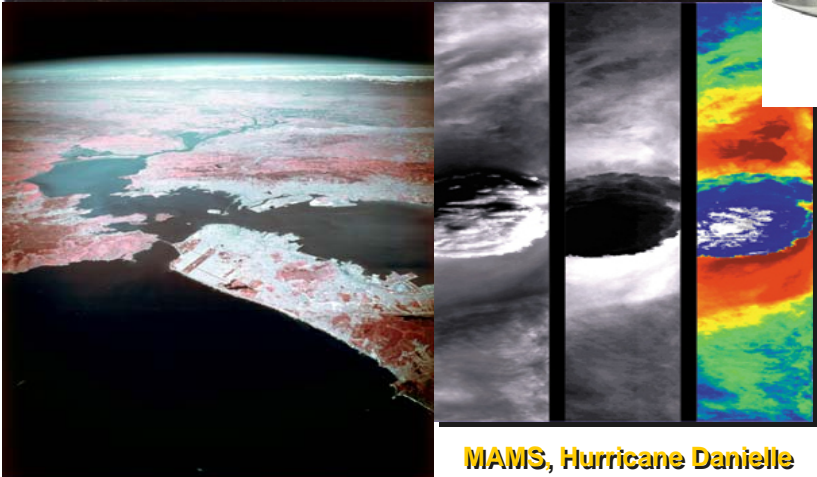
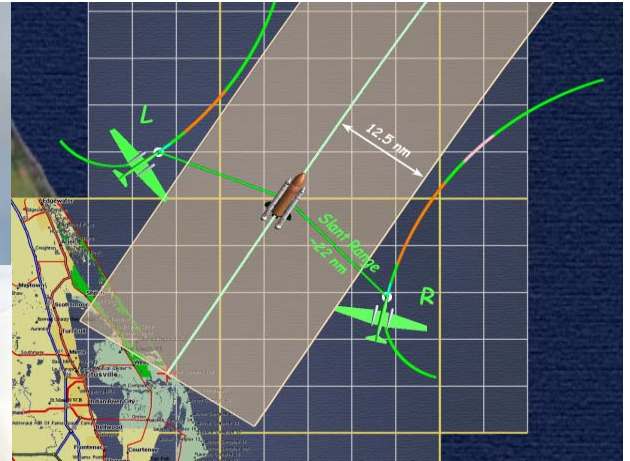
Represent all SMD Aviation Assets including SOFIA to the Agency



Over 50 aircraft available to the Program



Heavy Lift High altitude fleet (50k+ feet)



MAMS, Hurricane Danielle

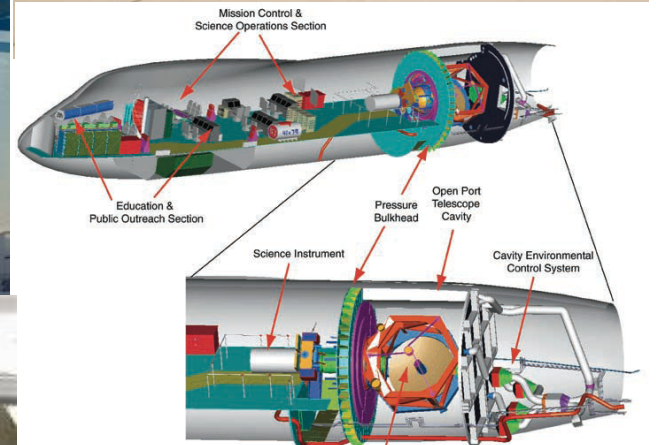


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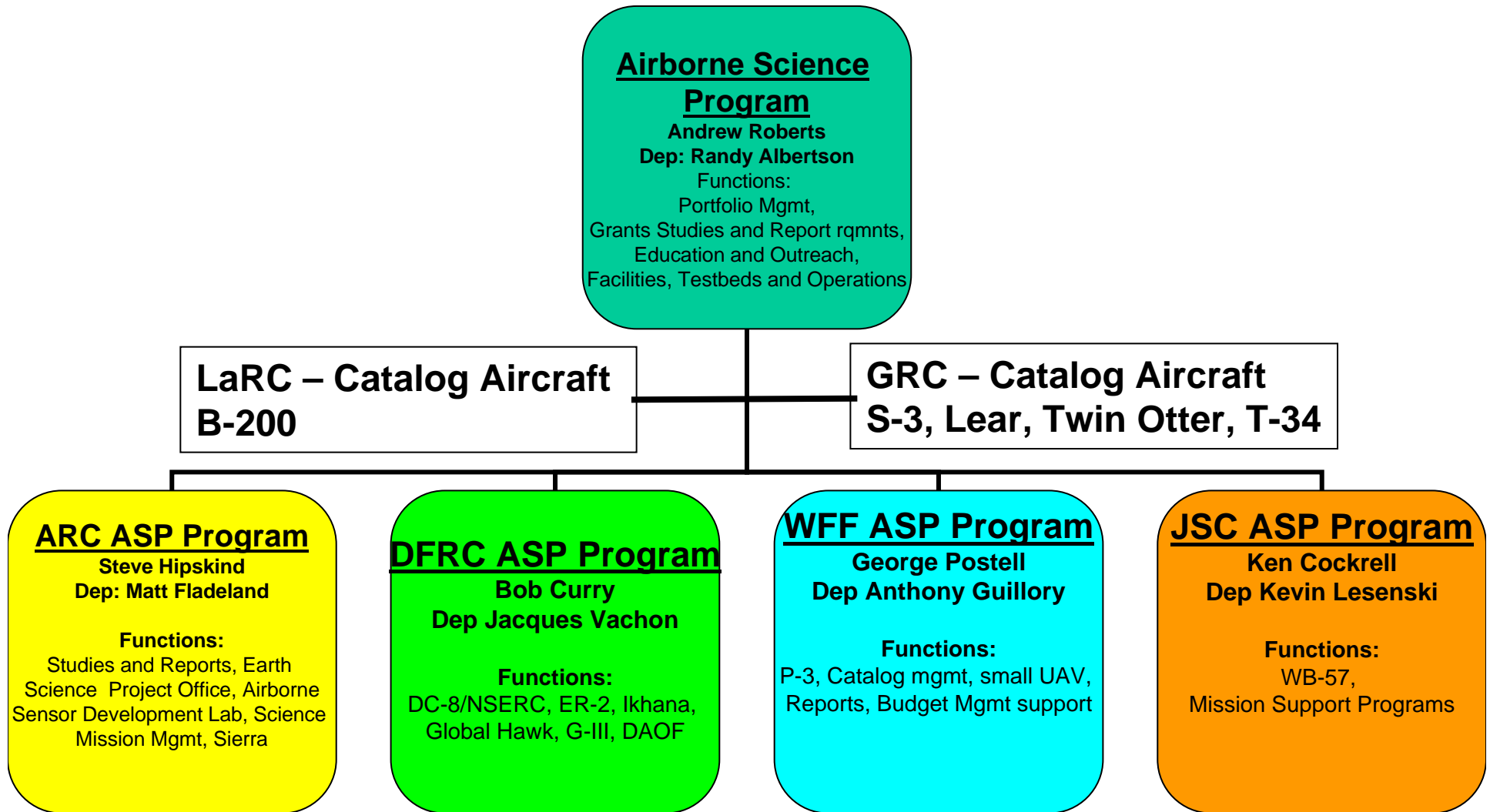


Reconfigurable large flying laboratories



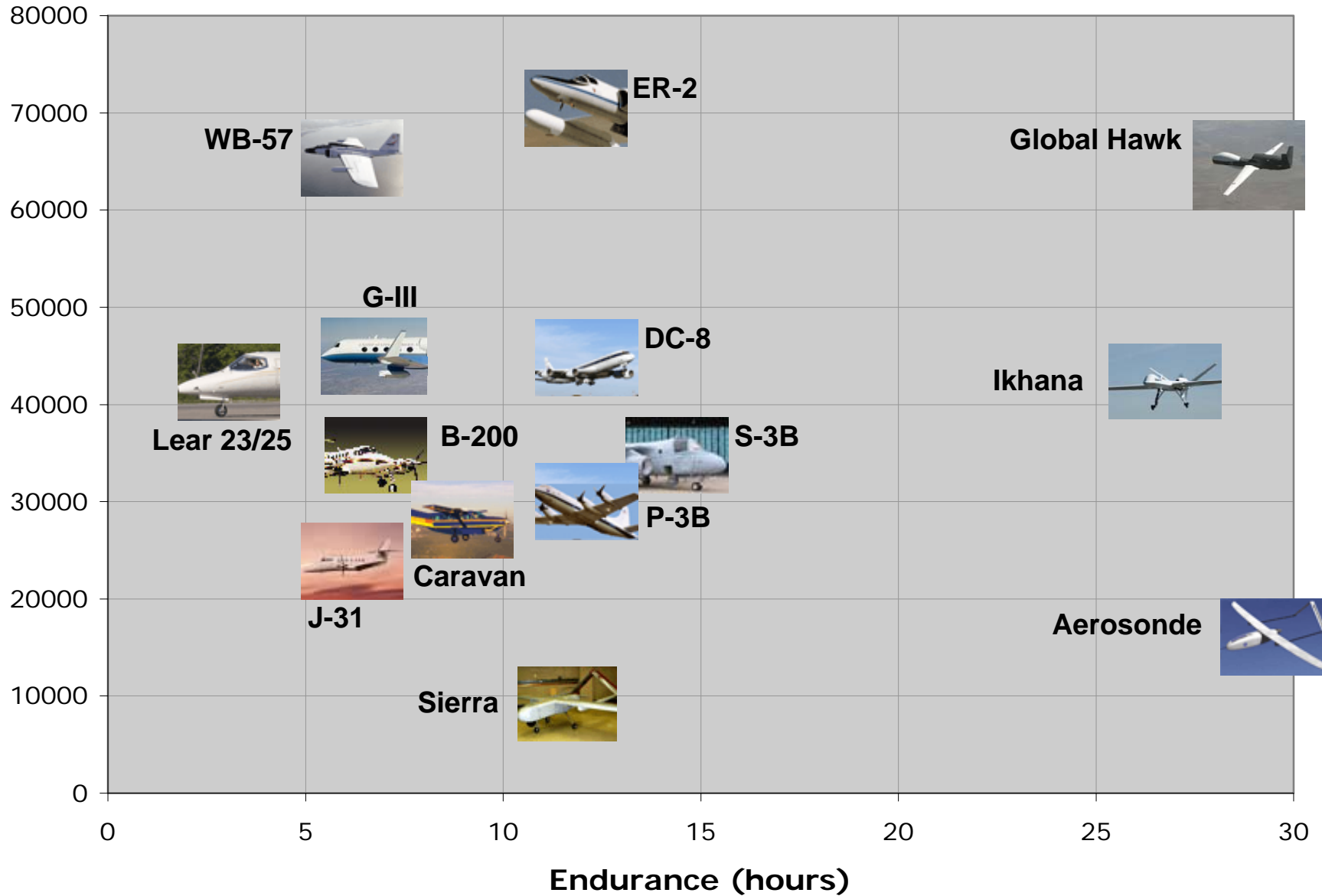


Airborne Science Program



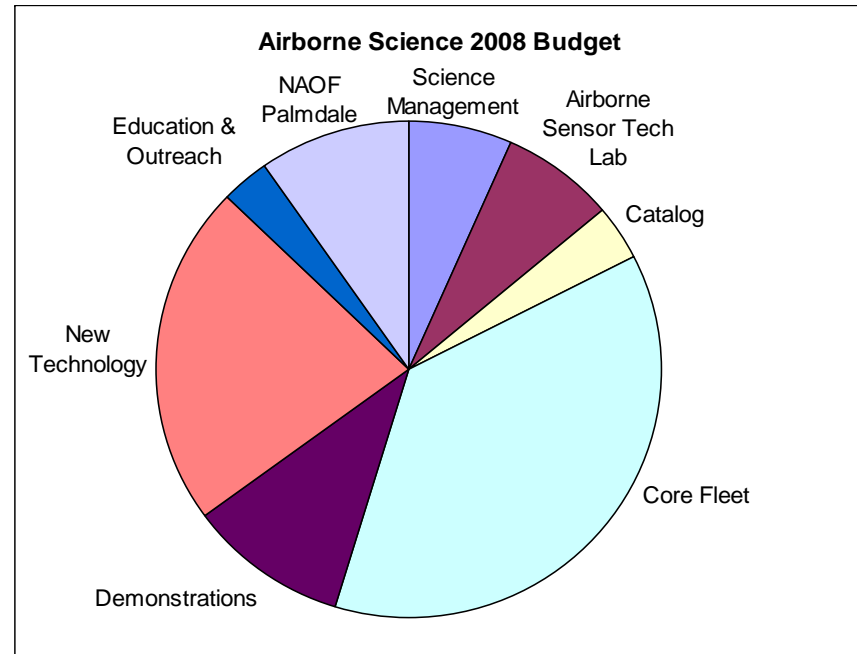
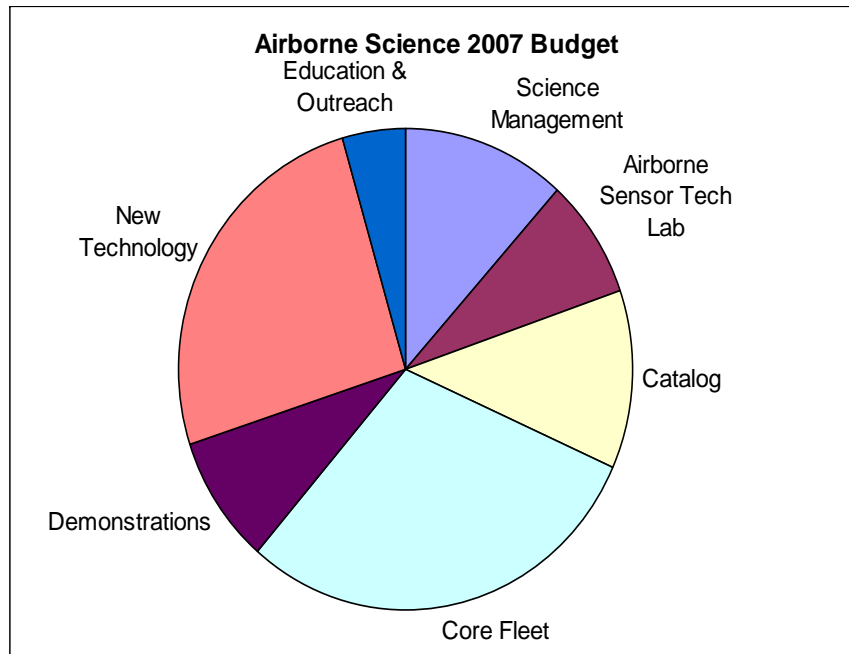


NASA Airborne Science Aircraft





Airborne Science Program Budget (less CMO and taxes)



FY08	FY09	FY10	FY11	FY12	FY13
\$31,133	\$26,271	\$25,671	\$23,970	\$26,370	\$26,968

Does not include Site 9 operations costs or CM&O

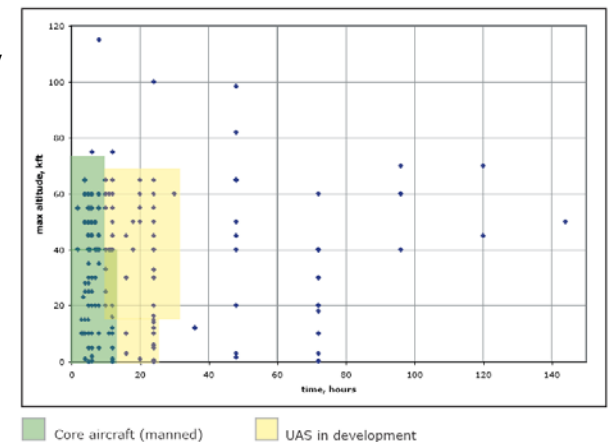


Airborne Science Program Update

- Increased Focus on Core Aircraft – maintaining, upgrading and standardizing interfaces
- Program name change Suborbital Science to Airborne Science
- DC-8 Moved to DFRC Control – NSERC maintains Science and Mission Ops
- Establishing a new facility at Palmdale for Airborne Science
- Adding Global Hawks to Core aircraft
- Increase GRC and LaRC participation in the NASA Airborne Science Program
- Going from National Science Objectives to Required Measurements to Platform Selection
 - Released Requirements Document
- Major Aircraft upgrades: WB-57 gear, DC-8 avionics and experimenter interface, WB-57 GWI and Superpods, P-3 CAR and radiometer upgrades.
- Establish a core ASP engineering capability in the centers, more FTE's/WYE, BPA
- Sensor Portability
 - New Data Distribution System based on IWGADTS standards in Core fleet
 - Started Intercenter Integration Guide for experimenters
- Develop bridges to our national and international community
 - Strengthen ICCAGRA
 - Work with ICORSE
 - Significant participation with ISRSE 09 Conf, Italy
- Establishing a recognition program
- Developing a History of Airborne Science

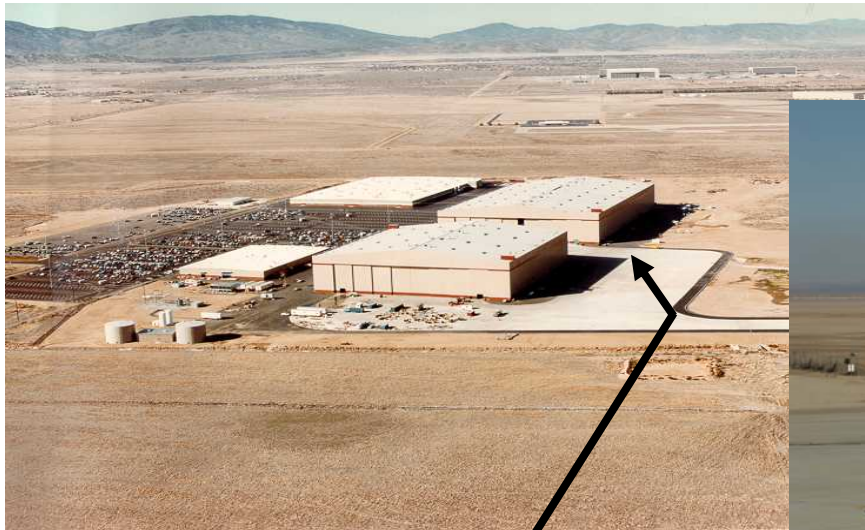
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Airborne Science Program Capability Additions



NASA and Los Angeles World Airports signs off on an Airborne Science Facility in Palmdale



USAF signs MOU with NASA authorizing the Transfer of two flyable Global Hawks

Ikhana starts operations



SIERRA starts test flights
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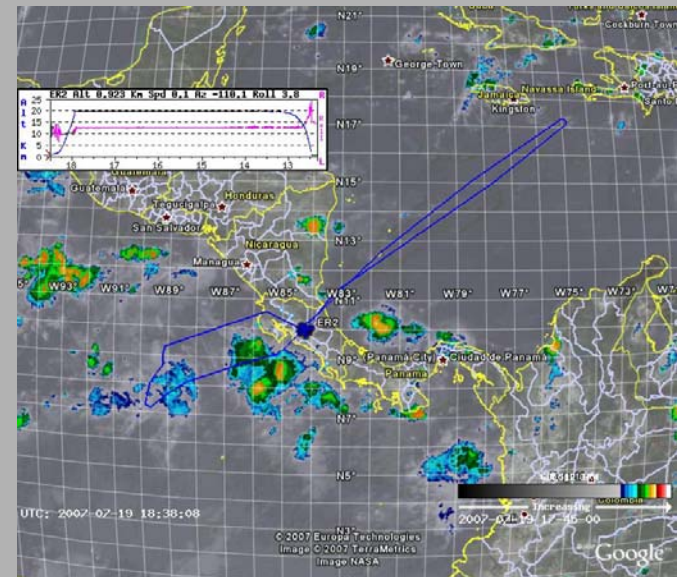




Real Time Airborne Science Management

This tool is an interactive visualization application that provides situational awareness, field asset management to enable adaptive and strategic decision making during field campaigns.

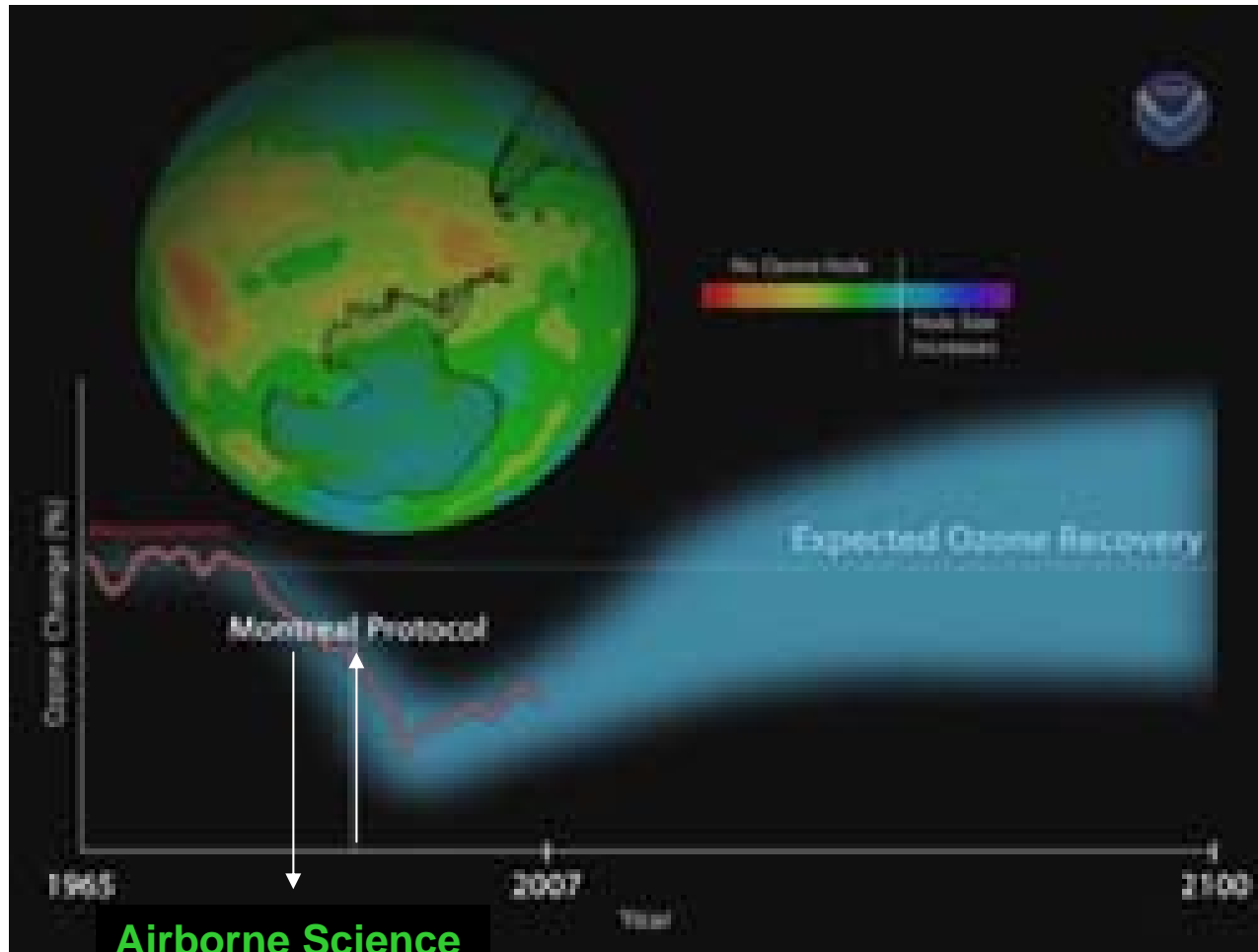
- Integrates satellite, airborne and surface data sets
- Displays model and forecast parameter fields
- Tracks airborne vehicle state information



ER-2 flight track on 19 July 2007



ASP Impact on Science and Policy



**Airborne Science
Discovers CFCs
as Ozone hole
main contributor**

How policy generated from Airborne and Space acquired data has protected our planet

Over 1,100 peer reviewed articles cited more than 15,000 times over past 20 years



Collaborations

- NOAA
 - Imbedded NOAA officer in Ikhana program
 - First implementing arrangement to MOU (Hurricane Boundary Layer Mission)
 - Global Hawk implementing arrangement
 - Great Lakes Environmental Research Laboratory (T-34 & Lear 25)
- USFS
 - Wildfire Research and Applications Partnership (Western States Fire Mission)
- DOE
 - CLASIC
- DoD
 - WB-57, ER-2 & Sierra
- DHS
 - ER-2
- FAA
 - Certificate of Authorization process (UAS in the NAS)
 - Detail to Unmanned Aircraft Program Office
 - UAS NAS Access Roadmapping effort
- Northrup Grumman
 - WB-57 & Global Hawk