ACCRI
Aviation Climate-Change Research Initiative

Outline

What is it?
Background
How can GMI help?

Malcolm Ko
June 13, 2007
ACCRI
Aviation Climate-Change Research Initiative

• An attempt to co-ordinate research efforts funded by NASA ESD and FAA

• Steps
  – White papers now - 12/07 (FAA)
  – Workshop 2/08, report 4/08 (FAA)
  – ROSES NRA call for FY08 (NASA)
  – Assessment calculations 6/08 - 6/09 (FAA)
  – Long-term research activities funded by FAA and NASA beyond 2009

• Why the sudden urgency?
Previous NASA Activities

- AEAP (~1990)/subsonic (~1997)
  - NASA Aeronautics funding, science team managed by Earth Science
    - Michael Prather, Rich Stolarski, Randy Friedl, Don Anderson, Randy Kawa

- Assessment Reports
  - Several NASA reports 1991 - 1998
  - IPCC 1999
• Instantaneous forcing from cumulative emissions
• Different picture if one looks at instantaneous forcing from one year operation
• Different picture if one looks at integrated forcing
• Cannot be used directly for trade studies
• Uncertainty estimates have not changed significantly

- IPCC, 1999
The players

NASA Administrator

JPDO

SMD

ARMD

Environment WG

ESD

subsonic

D. Anderson

Research

Applied Sc

US

Same people At FAA

ICAQ

CAEP

international

Initial contacts 2005

current

Path not taken
ICAO

International Civil Aviation Organization

- CAEP, Committee on Aviation Environmental Protection
  - Carl Burleson (FAA) heads the US delegation
- Previous focus on noise and air quality
- Global climate is a new thing
- Concerned with certification process
- Work on 3 year cycle, next big meeting in 2/2010
JPDO
http://www.jpdo.gov/index.asp

- **US multi-agency body**
  - FAA, NASA, DOT, DOD, DHS, DOC, OSTP
  - No line authority, work with participating agencies to create and co-ordinate NextGen activities
- **NextGen activities**: enable aviation transportation system to meet demands
  - Keep fliers happy, less delay
  - Able to build/expand airports
  - Able to land in international airports
  - Climate issue
- **Working Groups**
  - Aircraft, airport, air navigation services, environment, global harmonization, net centric operation, safety, security, weather
Common Interests between CAEP and Environmental WG activities

- How to design fleet and operation to minimize environmental impacts?
  - Noise, local air quality, climate
  - Metric for trade studies
- CAEP: more concerned with Standards and Certification
- EWG: enable US aviation transportation system to meet demands
  - Keep fliers happy, less delay
  - Able to build/expand airports
  - Able to land in international airports
- Life cycle for fleet: 20 years from design to production; 40 years service; need science input now for 2025 design for operation through 2065
The players

NASA Administrator

SMD

ARMD

ESD

Applied Sc

Research

D. Anderson

subsonic

Environment

WP

JPDO

ICAO

CAEP

Same people

At

FAA

US

Path not taken

initial contacts

current

2005

international
Our Role

• They need our help
• Put ourselves in their shoes and provide answers to specific questions
• Be vigilant how the answers may be used to justify specific metric
  – Quantify uncertainties at every step
  – If it does not make sense, say so
• White Papers:
  – Contrail (UT/LS water vapor)
  – Metric: inhomogeneous forcing, ozone, contrail vs WMGHG like CO₂
  – Capture effects of operation changes (model grid, plume processing, etc.)