



Aviation Climate Change Research Initiative (ACCRI)

A coordination between FAA and NASA

Presented to: NASA Applied Sciences Program

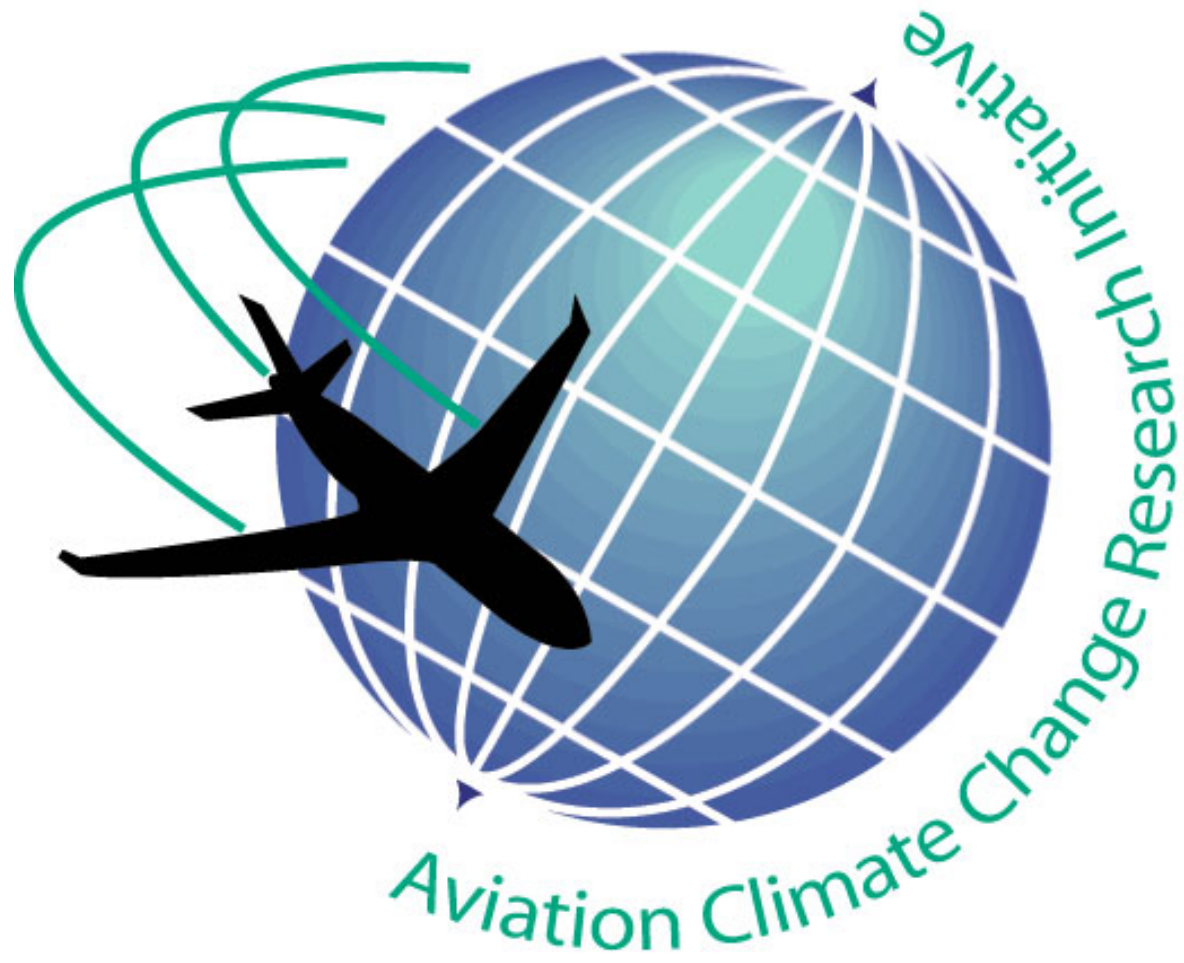
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Federal Aviation Administration





ACCRI

ACCRI – Aviation Climate Change Research Initiative
Presented by Mohan Gupta



Federal Aviation
Administration

ACCRI Foundation

Key recommendation of 2006 Workshop on ‘Impacts of Aviation on Climate Change’:

‘...need for focused research efforts to address identified uncertainties and gaps in our understanding of current and projected impacts of aviation on climate and to develop metrics to characterize these impacts.’

<http://web.mit.edu/aeroastro/partner/reports/climatewrksp-rpt-0806.pdf>

This workshop was organized under the auspices of JPDO/NextGen and was funded by FAA and NASA.



Aviation Climate Change Research Initiative (ACCRI)

Goal

Reduce key scientific uncertainties in quantifying aviation-related climate impacts and provide timely scientific input to inform policy-making decisions for NextGen and CAEP.

Objective

Improve the state of knowledge and address key research gaps while making the best practical use of available science and modeling capability.

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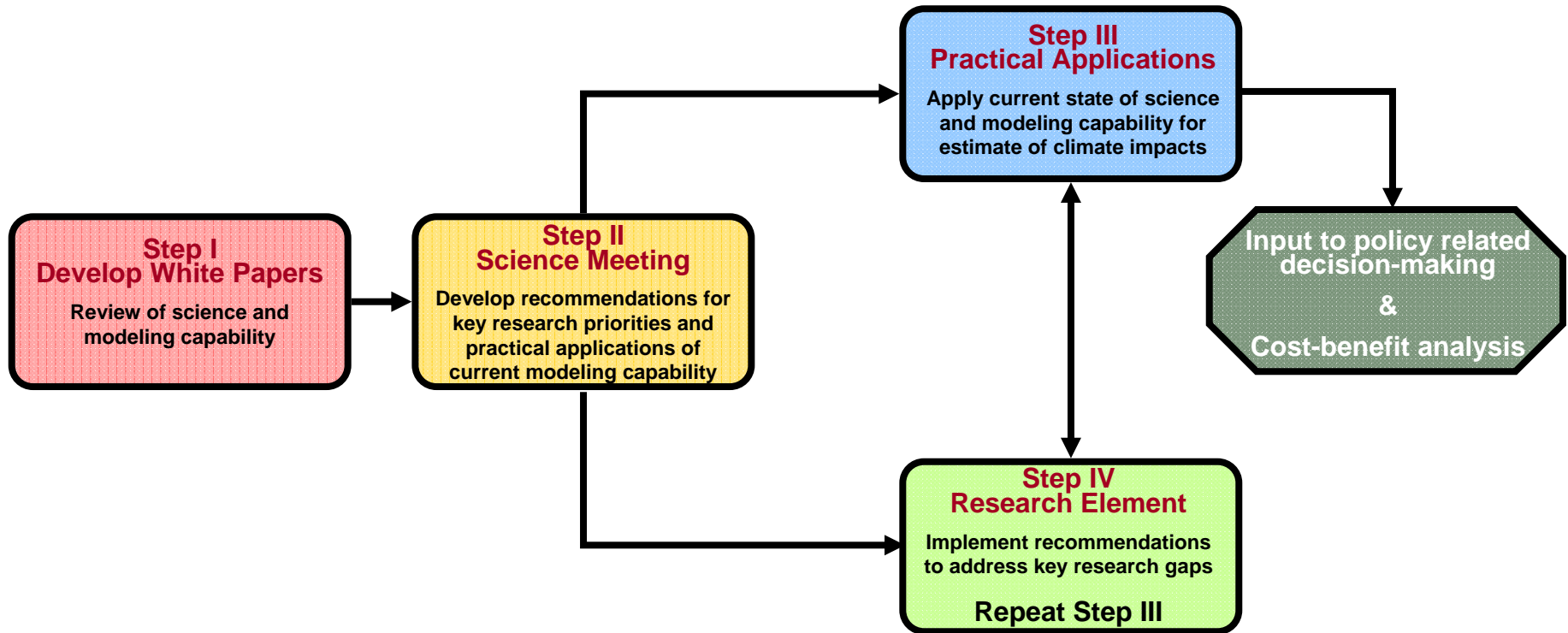
FAA and NASA Participating Offices

- FAA Office of Environment and Energy
- NASA Earth Science Research Division
- NASA Applied Sciences Program



ACCRI Structure

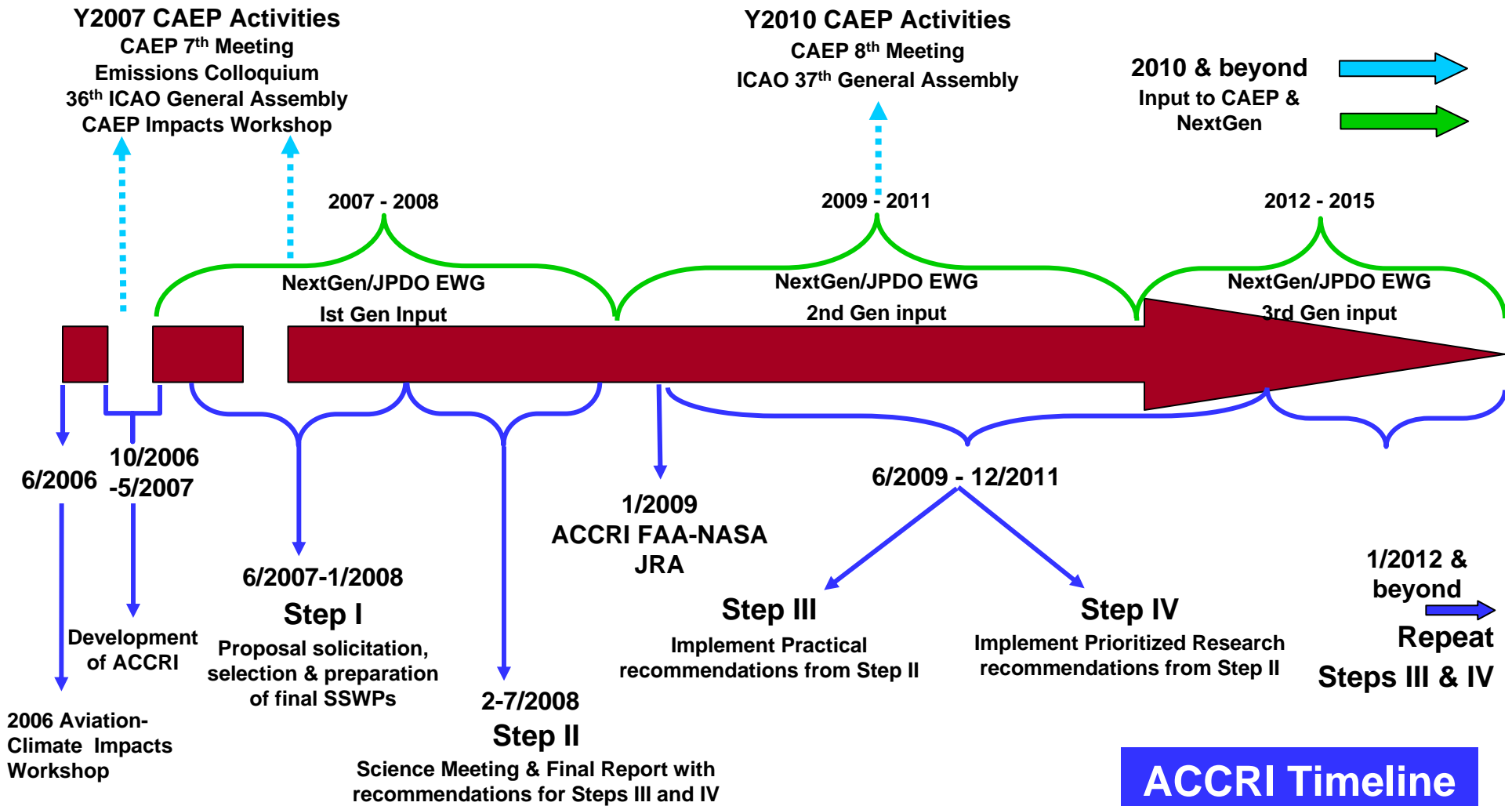
Sequential four-step process, with prior steps setting direction and framing expectations from the subsequent steps.



The focus is on the science research and model-measurement analyses for practical applications.

ACCRI Timeline and Intermediate Use of Information

Intermediate Usability



ACCRI Timeline



ACCRI – Step I

In-depth review of the state of science and modeling capability (Aug, 2007- Jan, 2008)

Develop subject-specific white papers (SSWP) on four broad areas:

1. UT/LS chemistry and transport
2. Contrail and cirrus clouds: Formation, microphysics and lifecycle
3. Contrail and Cirrus clouds: Optics and Radiation
4. Climate impacts and metrics

ACCRI SSWP solicitation asked to provide in-depth review of the current state of science, gaps and uncertainties as well as current modeling/analysis capability while collectively covering all dimensions of aviation-climate change research.

Provide recommendations on how to:

- advance state of the science and modeling capability
 - Identify key areas of improvement and prioritize them based on their impacts, achievability, resource requirements and associated timelines
- best use present state of science and modeling capability to
 - better quantify magnitude of climate impacts of aviation and associated uncertainties for present and future conditions;
 - Identify and develop metrics to measure these impacts on all relevant scales



ACCRI – Implementation and conclusion of Step I

Identified four broad areas and seven specific themes

- Solicited proposals from broader international community through the Volpe support
- Received 18 proposals
- Reviewed by 7-member panel with representatives from the FAA, NOAA, NASA and EPA
- Selected 8 proposals based on the following criteria
 - Knowledge of the issues
 - Approach
 - Practical relevance
 - Interconnectivity
 - Background and experience
 - Cost
- Final versions of all SSWPs were received on Jan. 22, 2008 and are now available on the FAA KSN site for review and online discussion in preparation of ACCRI Science Meeting (Step II)



ACCRI – Step I

Selected teams for preparation of SSWPs:

UT/LS Chemistry and Transport

- York University
- University of Colorado

Contrail and contrail-cirrus formation, microphysics and radiation

- UCLA
- DLR, Germany
- Texas A&M
- International team (USA, UK, Germany, Mexico led by NCAR)

Climate Impacts and Metrics

- University of Leeds, UK
- University of Illinois- Urbana Champaign

ACCRI – Step II

Step II Activities (Feb-Apr, 2008)

- 3-day science meeting will be held in Virginia Beach (Feb. 25-27, 2008)
- This meeting will be attended by 80+ international science experts
- Development and review of composite report

Key focus

Discuss and integrate findings from all SSWPs into a composite report on:

- A. Recommendations for prioritized research needed to improve the state of scientific knowledge and modeling capability;
- B. How to best utilize current state of scientific knowledge and modeling/data analysis capability?
 - Recommendations for selection of models/modules that best represent the present state of knowledge;
 - Develop scenarios (for present and future conditions) for model simulations and analyses

Relevance to Steps III and IV

- Findings and recommendations under A will be carried out under Step IV
- Recommendations under B will be adopted in Step III to make the best practical use of present state of science and modeling capability to quantify climate impacts of aviation emissions with associated uncertainties and identify metrics to measure these impacts.



ACCRI – Step Cycles and Funding Status

- **Steps I and II**
 - The FAA is fully funding all activities under Steps I and II
- **Step III**
 - Outcomes of activities under Step III will immediately support policy-making decisions at NextGen and CAEP;
 - Need dedicated support for multi-model, multi-team and multi-simulation activities
 - Expect this activity to be concluded within 2-year timeframe after dedicated funding is in place (*tentatively 2009-2012*)
- **Step IV**
 - This will be a long-term effort that needed to be pursued on several fronts simultaneously with Step III
 - Lessons learned from Step III will also guide future directions of Step IV
 - Need sustained funding support
- **Repeat of Step III during evolving progress under Step IV**
 - Refine climate impact estimates through improved science and modeling capabilities achieved under Step IV

There could be a possibility to address some of the broader science issues through NOAA's supported research activities.

