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**University-National Oceanographic  
Laboratory System (UNOLS), Scientific  
Committee for Oceanographic Aircraft  
Research (SCOAR).**

**June 24, 2011**

***Summary of the  
Exploratory Mini-Workshop  
Utilization of Unmanned Aircraft Systems for  
Environmental Monitoring (Feb 4, 2011)***

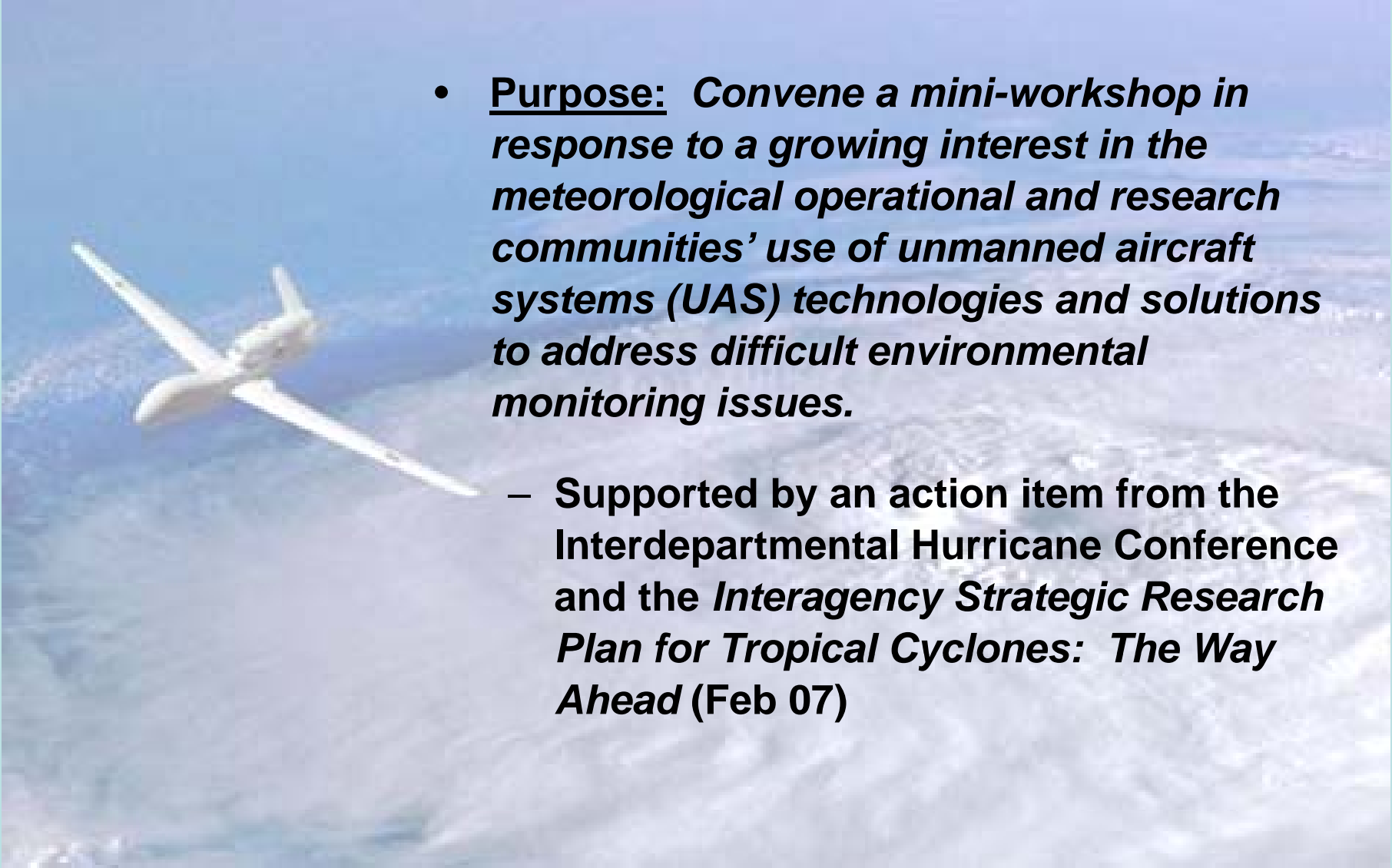
**Mr. Michael Bonadonna  
Senior Staff Meteorologist**

**Office of the Federal Coordinator for  
Meteorological Services and Supporting  
Research**



# Purpose

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- **Purpose: Convene a mini-workshop in response to a growing interest in the meteorological operational and research communities' use of unmanned aircraft systems (UAS) technologies and solutions to address difficult environmental monitoring issues.**
    - Supported by an action item from the Interdepartmental Hurricane Conference and the *Interagency Strategic Research Plan for Tropical Cyclones: The Way Ahead* (Feb 07)

# Objectives

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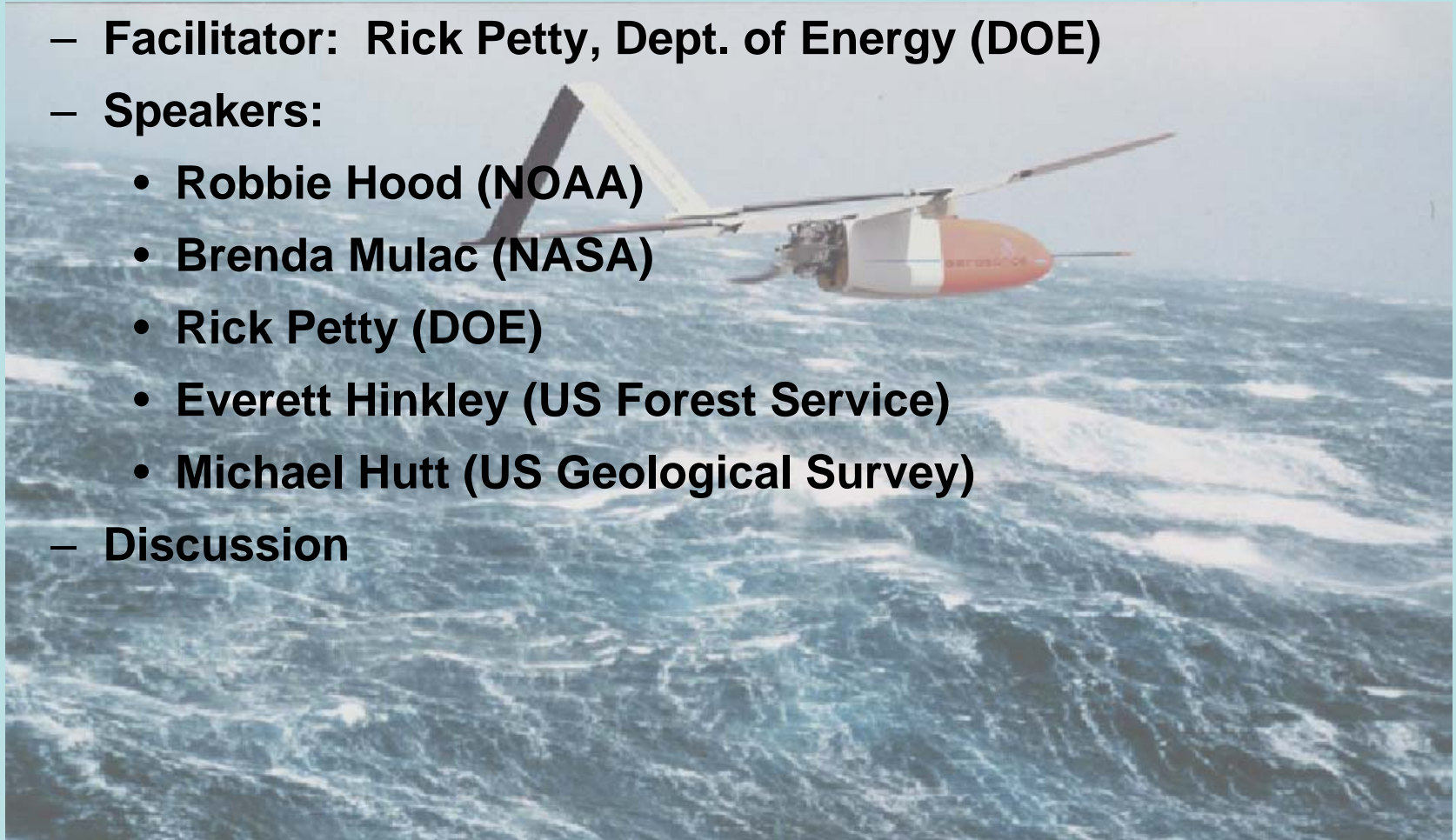
- **Share information among active and interested agencies**
- **Identify opportunities to collaborate and leverage activities**
- **Identify roadblocks to success and identify potential courses of action to eliminate or mitigate them**
- **Identify community direction and support for next steps**



# Agenda

## Session 1: Unmanned Aircraft System Applications for Environmental Research and Monitoring

- **Facilitator:** Rick Petty, Dept. of Energy (DOE)
- **Speakers:**
  - Robbie Hood (NOAA)
  - Brenda Mulac (NASA)
  - Rick Petty (DOE)
  - Everett Hinkley (US Forest Service)
  - Michael Hutt (US Geological Survey)
- **Discussion**





# Agenda

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## Session 2: Challenges to the Development and Use of UASs for Environmental Monitoring

- **Facilitator: Mike Bonadonna, OFCM**
- **Speakers:**
  - **Randy Willis (Federal Aviation Administration)**
  - **Tom Faller (US Customs and Border Patrol)**
  - **LCDR Jeffrey Vajda (US Coast Guard)**
  - **Lt Col Peter “Pepe” LeHew (US Air Force)**
  - **LTC Trey Kelley (US Army)**
- **Discussion**



# Agenda

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## Session 3: Interagency Coordination and Strategic Planning for the Use of UASs to Support Environmental Monitoring



- **Facilitator: Kim Curry (US Navy)**
- **Speakers:**
  - **Rear Admiral Philip Kenul (NOAA)**
  - **Reginald Beach (NOAA)**
  - **Matt Lucas (TriVector Services)**
- **Discussion**

# Key Take-Aways

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- **Technology has progressed to the point where UAS should be considered a viable approach to accomplish a wide variety of environmental monitoring missions.**
  - They are particularly appropriate for those “dull, dirty, denied, or dangerous” applications not well suited for manned aircraft.
- **The development of UAS capabilities and programs within agencies should be approached from a “Program of Record” point of view and consider full life cycle costs.**
  - The majority of life-cycle costs are incurred during the operation and maintenance phase of the program.
  - “Hobby-shop” approaches are not viable for long-term mission satisfaction.
- **UAS technologies are adaptable for a wide variety of missions and transferable between organizations.**
  - There’s no need to reinvent a system when you can leverage the investment already made by other agencies.
  - The DOD can be a particularly useful partner for leveraging technology, systems, procedures, etc.

# Key Take-Aways

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- **The need for interagency communication and transparency is paramount.**
  - Numerous UAS activities that have taken place, are in-progress, or are planned can benefit other organizations.
- **The Federal agencies must present a coherent, coordinated approach to the development and utilization of UASs in order to mutually support UAS initiatives and programs.**
  - This must fit within an overall construct of all unmanned systems (including ground, sea surface, and undersea systems) for environmental monitoring.
- **A number of challenges to the implementation of UAS solutions for environmental monitoring exist including:**
  - Routine access to the National Airspace System (NAS)
  - UAS infrastructure and support
  - Interagency/international coordination
  - Data and system standards.



# Potential Government Actions

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- **Coordinate the efforts of organizations interested in UAS development and utilization for environmental monitoring and related missions.**
- **Find or establish a data/metadata clearinghouse for UAS missions so that information can be shared across agencies. NOAA's National Data Centers may be the best organizations to consider.**
- **Crossfeed information about miniaturized sensor development for UAS platforms amongst the community as much as possible.**
- **Crossfeed information about the Joint Center for Satellite Data Assimilation (JCSDA) to the UAS community to serve as a model for interagency development and exploitation of UAS capabilities.**
- **Establish data standards to maximize use of data obtained from UAS missions.**
- **Establish instrument and sensor calibration standards. The UAS community could leverage examples from other systems (radar, balloon, surface observation, etc.)**

# Did we achieve our objectives?

- **Objectives**

- Share information among active and interested agencies
- Identify opportunities to collaborate and leverage activities
- Identify roadblocks to success and identify potential courses of action to eliminate or mitigate them
- Identify community direction and support for next steps



# Mini-Workshop Follow-up

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- Presentations are posted on the OFCM web site:

<http://www.ofcm.noaa.gov/uas/workshop/index.htm>

OFCM prepared a summary report on the mini-workshop

- Forwarded to attendees for review and comment
- Forwarded to the Interdepartmental Committee for Meteorological Services and Supporting Research for review
- Published and Posted on the OFCM web site

<http://www.ofcm.noaa.gov/r32-UAS/fcm-r32.htm>

- OFCM will organize follow-on activities, as appropriate, to address the recommendations from the mini-workshop

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# Thank you

