

Justification for Emergency Approval

NASA Airborne Research Experience for Educators (AREE) Application

NASA is requesting emergency approval for the collection of data, using elementary and secondary teacher application forms to support the operation of the new NASA Airborne Research Experience for Educators. This experiential project is part of the Education Flight Projects program at Dryden and will enhance teacher training to instruct the future aeronautical workforce in the United States. The emergency nature of this request is due to delays in the availability of funding to begin the program. Funding was made available recently for the program which is to begin activities in July 2009 due to schedule availability of the DC 8 aircraft. Applications for participants have to be obtained prior to the end of the traditional school year before educators have completed their 2008-2009 school years. We request that NASA be granted an emergency approval so that the Summer 2009 application process can proceed. If this emergency request is not granted the AREE program can't be conducted because the aircraft and the educators will not be available for AREE activities beyond the existing schedule for the Summer 2009.

We were not able to submit an Information Collection Request (ICR) previous to this time because the funding was not assured for the program. This program was competitively selected by the Teaching From Space (TFS) program and selection decisions and funding awards were only recently completed. TFS is a NASA Education office co-located with the Astronaut Office at the NASA Johnson Space Center. Education Flight Projects and its associated activities are under the TFS umbrella and are managed by the JSC Education Office.

Background

Participants will engage in airborne science research by collecting in-flight sensor data of air, land, and sea during two 5- or 6-hour flights aboard a NASA DC-8 aircraft. The aircraft, located at Dryden Aircraft Operations Facility in Palmdale, CA, is a flying laboratory used for Earth science observation, satellite verification, and sensor development. Two instruments integrated into the aircraft's test racks will collect sensor data for research in crop classification, algal blooms, and atmospheric science, important components in understanding Earth System Science. To complement the data collection process, results will be compared with data collected from scientific modeling, in-situ ocean sampling, and a satellite Sensor Web.

The program will culminate with educators developing curriculum-based activities resulting from their observations and experiences during the six-week program. A faculty advisor will mentor and assist educators in the development of effective and meaningful curriculum based on national education standards and state frameworks. The program is a complete end-to-end research experience in airborne remote sensing and atmospheric science, thus providing participants with a unique NASA learning environment.

The AREE project supports NASA's strategic mission to streamline individuals into a seamless pipeline to advance careers in science, technology, engineering and mathematics by engaging participants in hands-on, inquiry-based, learning experiences using Dryden flight test research and airborne science platforms. The specific education objectives of the project are to:

- Use NASA-related topics and experiences to increase educators' content and pedagogical knowledge in STEM disciplines.
- Use NASA-related topics to increase educators' capability to design and implement more stimulating and engaging lessons and experiences for students.
- Improve the effectiveness of K-12 STEM educators in the use of curriculum and instructional practices that foster meaningful learning in STEM disciplines.

Project Timeline

July 6-July 11, 2009

Participate in preparatory instruction, assigned reading materials, teleconferences, and other tasks prior to arriving in California.

July 12-18, 2009

Upon arrival in Irvine, California, participants will engage in classroom instruction facilitated by mission faculty, National Suborbital Education and Resource Center (NSERC) staff, and NASA scientists and engineers. Instructional content relevant to Earth System Science research will be provided and explained prior to the research flights. Topics will include atmospheric chemistry, remote sensing, meteorology and other relevant subjects.

July 19-24, 2009

Educators will participate in instrument integration and pre-flight safety briefs and planning prior to two 5- or 6-hour science research flights aboard the NASA DC-8 aircraft. The aircraft is located at the Dryden Aircraft Operations Facility in Palmdale, CA. The purpose of the research missions is to collect in-flight sensor data of air, land, and sea for research in crop classification, algal blooms, and atmospheric science.

July 25 - August 14, 2009

Following the research flights, educators will engage in laboratory analysis, data reduction, and formulating conclusions. Results will be compared with data collected from scientific modeling, in-situ ocean sampling, and a satellite Sensor Web. Educators will develop curriculum-based activities resulting from their observations and experiences during the program. Facilitated by a faculty advisor, educators will incorporate NASA-related content and themes into their curriculum. Existing curricular support resources that use NASA content, relating to Earth System Science, will be accessible to educators for reference. Development of curriculum will occur via a synergistic approach between educators, staff, and faculty participating in the program. The process will culminate with educators presenting the product to program participants. A final draft will be submitted to post on-line for accessibility by the education community. Participants will travel home from Irvine, CA on August 14, 2009.

There are only 10 educator participants in this new experiential program. It is unknown how many applicants will apply, however the commitment required of the educators and the modest stipend involved suggest that an applicant pool of 25 would presage an excellent response. The application will require no more than one hour to complete per applicant for a total of approximately 25 burden hours. This is a new Information Collection Request (ICR). The Agency and OMB Federal Register Notices have not been published yet.