

# **MANAGEMENT OF NASA'S EARTH VENTURE-1 (EV-1) AIRBORNE SCIENCE SELECTIONS**

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## **ABSTRACT**

The Earth System Science Pathfinder (ESSP) Program Office is responsible for programmatic management of National Aeronautics and Space Administration's (NASA) Earth Venture (EV) orbital and suborbital (airborne) missions. Guidance for project lifecycle plans and processes required for the successful execution of these missions within the constructs of current governance models is a critical component of this responsibility. The first of the EV Missions is EV-1, the largest agency suborbital effort of its kind to date. Proposals for Principal Investigator-led, temporally-sustained, airborne-science investigations were solicited and competitively-selected via a NASA Research Announcement [1]. Five investigations totaling no more than \$150M (~\$30M each) were selected covering a broad range of earth science focus areas [2].

The EV-1 airborne-science investigations are both financially and temporally more comprehensive than typical airborne-science missions. Therefore, a tailored approach to mission management has been created that accommodates the risk-tolerant, real-time operational approach of airborne-science while maintaining a level of rigor commensurate with missions of this magnitude. Policy and best practices from existing NASA Procedural Requirements (NPRs), systems engineering guidance [5], management handbooks [6] and center processes were blended in order to manage the programmatic, technical, schedule, cost elements and risk elements of the EV-1 airborne science investigations. Traditional procedures, processes and standards used to manage Space Flight [3] and Research and Technology [4] represent proven NASA best practices and were leveraged to determine the gates and major events for each Life Cycle Phase. However, consideration for the high Technology Readiness Level (TRL) required of the proposals allowed for streamlining of the formulation phase of the project life cycle. This enabled EV-1 investigations to enter into operations as quickly as possible in order to maximize the

acquisition of temporally-sustained data. A tailored operational phase allowed for multiple deployments over multiple years and retained the ability to incorporate design and operational advancements as needed.

The tailored mission management approach presented here will be utilized for EV-1 and will set the precedent for future Earth Venture airborne-science missions.

## REFERENCES

- [1] Amendment 9: New proposal opportunity in Appendix A.39: ESSP Venture-class Science Investigations: Earth Venture-1 and Appendix A.39: ESSP Venture-class Science Investigations: Earth Venture-1 from Research Opportunities in Space and Earth Sciences (ROSES) – 2009. Solicitation: NNH09ZDA001N, 2009.
- [2] NASA'S Earth Venture 1 (EV-1) Airborne Science Selections, International Geosciences and Remote Sensing Symposium (IGARSS), Honolulu, HI, July 2010.
- [3] NPR 7120.5, NASA Space Flight Program and Project Management Processes and Requirements. Washington, DC, 2007.
- [4] NPR 7120.8, NASA Research and Technology Program and Project Management Requirements. Washington, DC, 2008.
- [5] Systems Engineering Handbook, NASA/SP-2007-6105, Rev1. Washington, DC, 2007.
- [6] Science Mission Directorate (SMD) Management Handbook. Washington, DC, 2008.
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