
National Aeronautics and
Space Administration
NASA
EXPLORE EARTH
Earth Venture Mission - 3 Pre-Proposal Conference
Earth System Science Pathfinder Program
Diane Hope – Mission Manager
December 17, 2020
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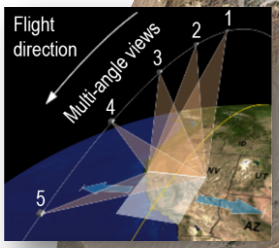
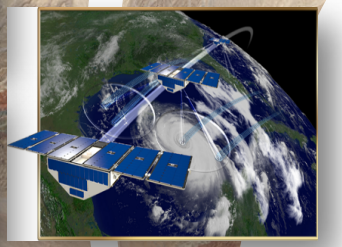
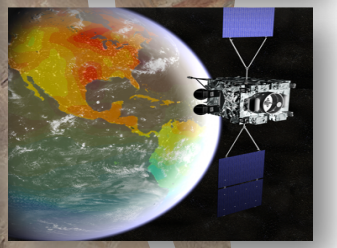


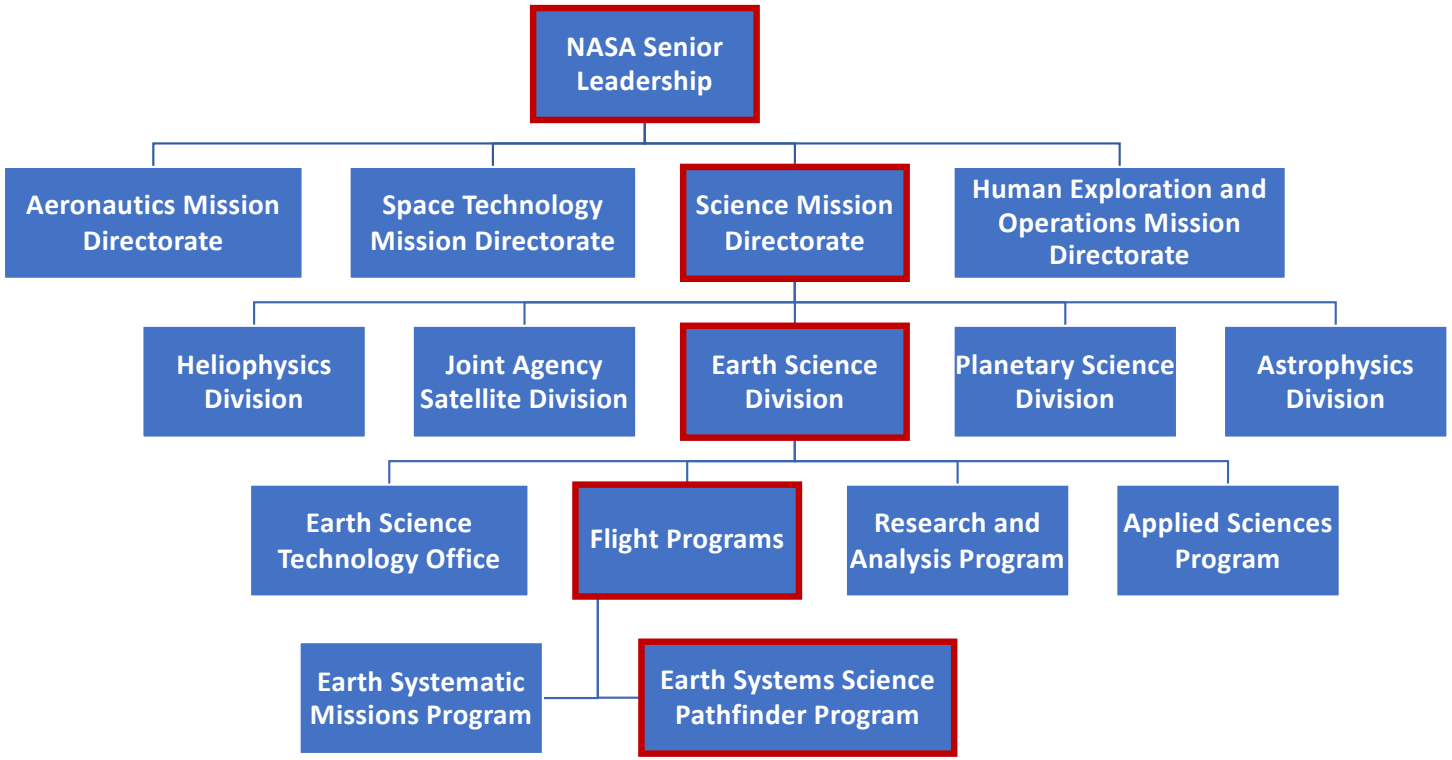



ESSP Program Overview

- The goal is to stimulate new scientific understanding of the global Earth system by:
  - developing and operating remote-sensing missions
  - conducting investigations using data from these missions
  - addressing unique, specific, highly focused requirements in Earth science research
- Projects in the ESSP portfolio are:
  - Science-driven
  - PI-led investigations
  - Competitively selected
  - Orbital or sub-orbital
  - Implemented within cost- and schedule-constraints
- https://essp.nasa.gov/latest-news/

Organizational Structure



- *NASA brings new observational capabilities to the nation and the world to advance science and serve society — now and in the future.*
- *Engaged in interdisciplinary Earth system science, NASA provides the rigorous scientific basis for answering tomorrow's questions.*

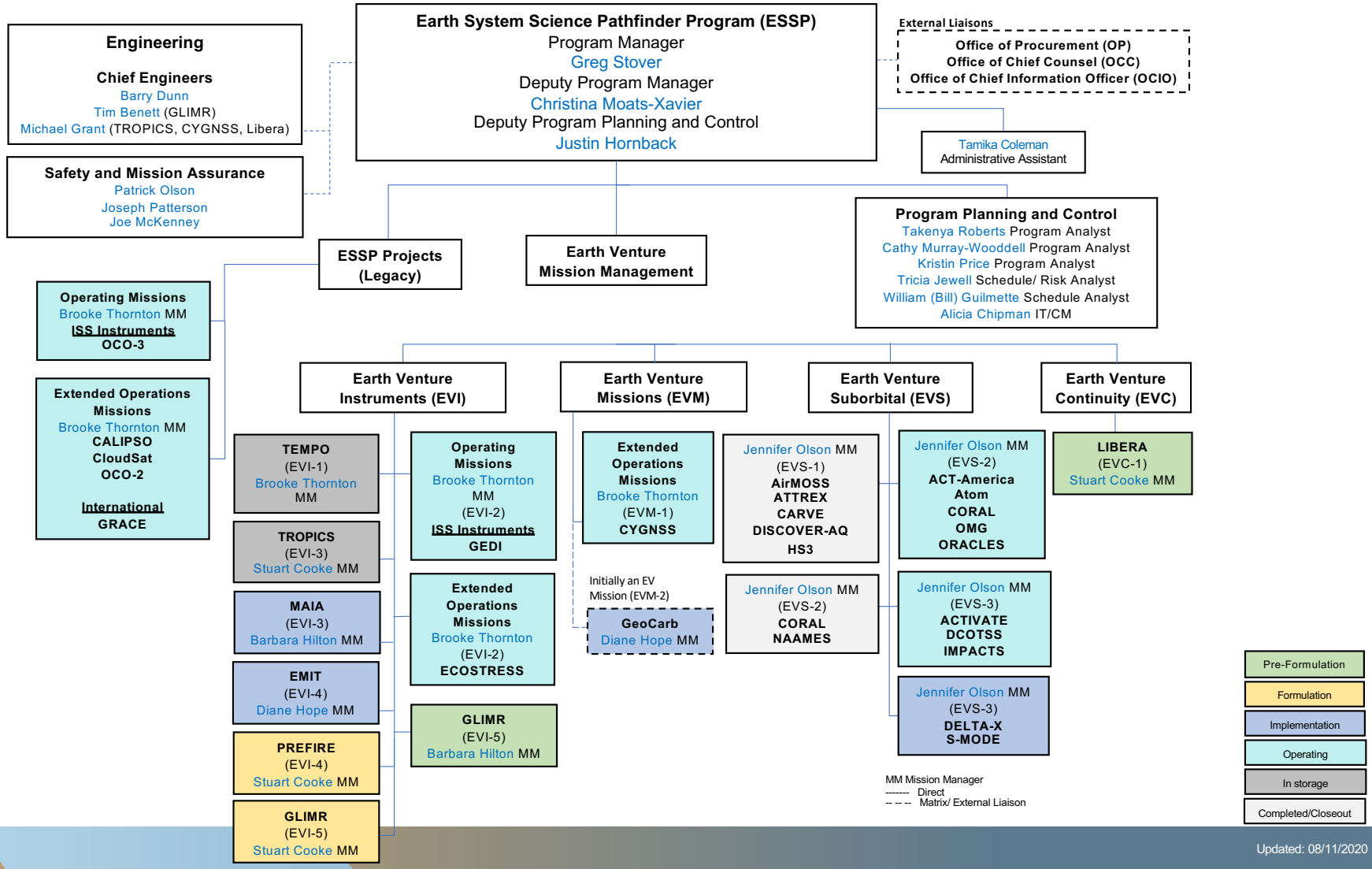
https://www.nasa.gov/sites/default/files/atoms/files/agency_org_chart_dec_2019.pdf

NASA Langley Research Center Organization

Langley is a research, science, technology and development Center that provides game changing innovations to enable NASA to make significant contributions to the Nation.

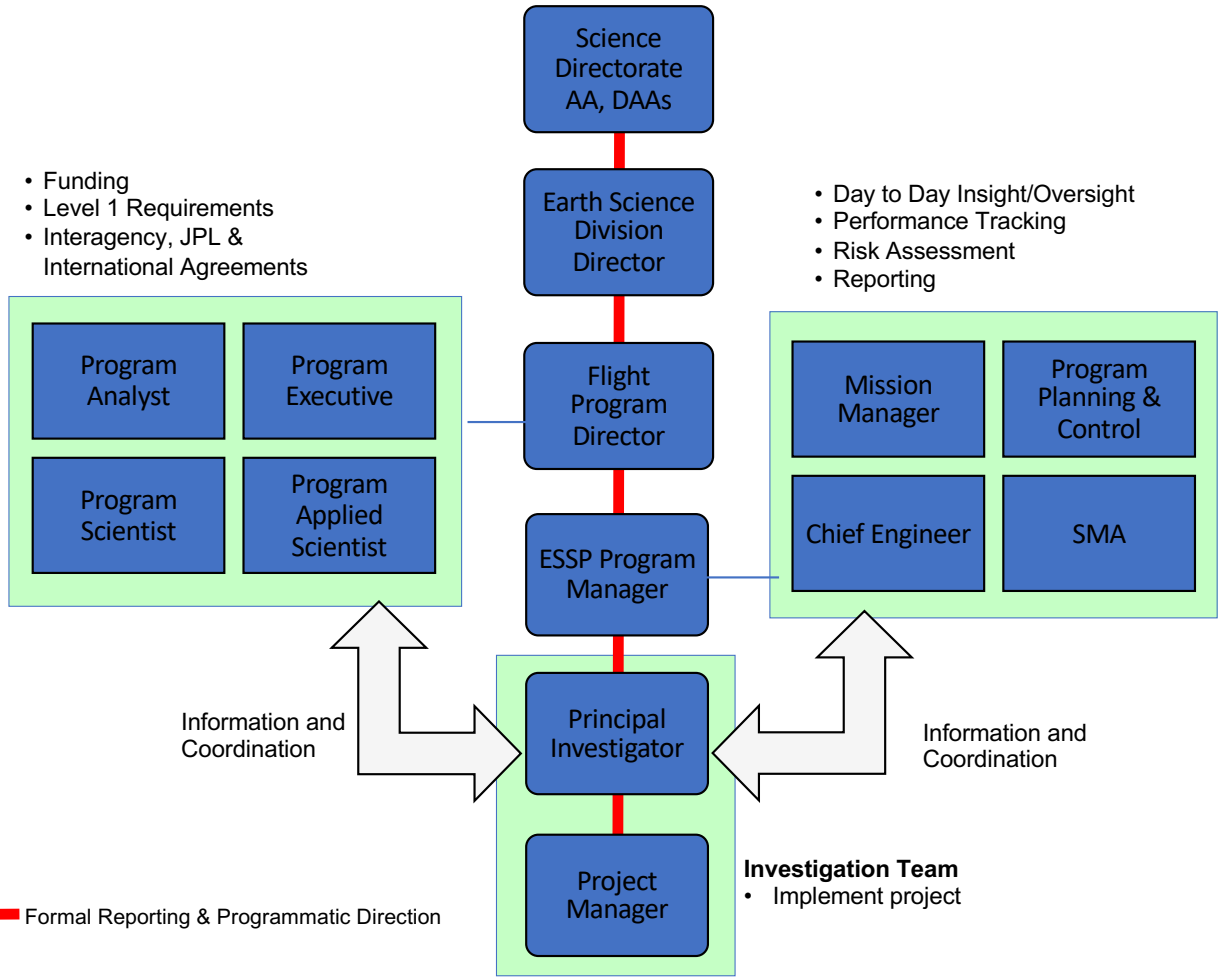
We Deliver on Today's Commitments and Create Tomorrow's Opportunities

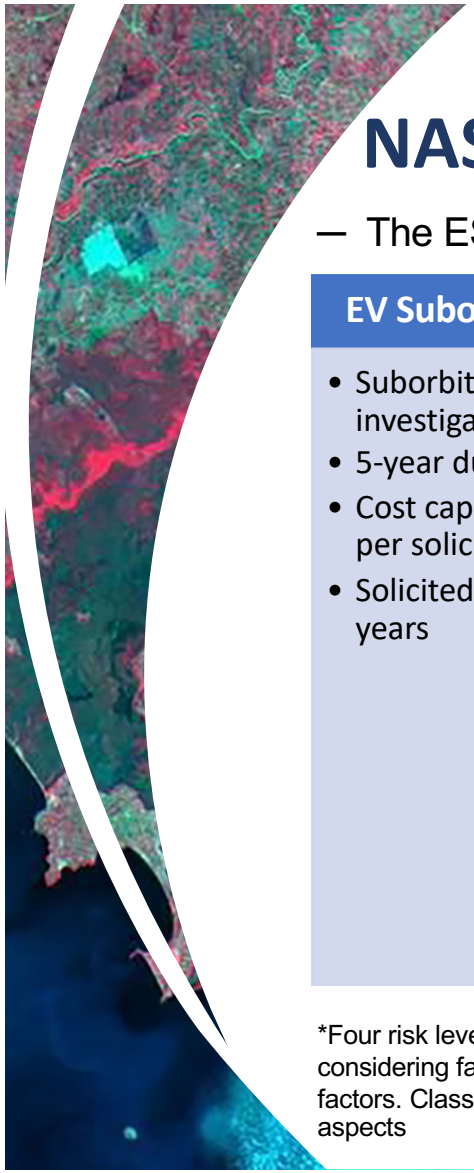
10/13/2020



Updated: 08/11/2020

Lines of Authority and Communications





NASA's Earth Venture Class

– The ESSP portfolio Earth Venture Class element has 4 strands:

EV Suborbital (EVS)	EV Mission (EVM)	EV Instrument (EVI)	EV Continuity (EVC)
• Suborbital/airborne investigations • 5-year duration • Cost caped at $150M per solicitation • Solicited every ~4 years	• Small complete missions • 5 years to launch • Class-D* • Small-sat or stand-alone payload as part of larger missions • Cost caped at $190M • Solicited every ~4 years	• Spaceborne instruments for flight on Missions of Opportunity (MoO) • ≤5years for development • Class-C* or Class-D* allowable • $30M-$100M total cost for development and operations • Solicited every ~3 years	• Spaceborne instrument or missions • Cost caped at $150M per solicitation • Solicited every ~3 years • specifically seeks to lower the cost for long-term acquisition of key "continuity" observations, rewarding innovation in mission-to-mission cost reduction through technology infusion, programmatic efficiency, and/or other means

*Four risk levels or classifications (A, B, C and D) have been characterized in the NPR 8705.4 Risk Classification for NASA Payloads by considering factors such as criticality to the Agency Strategic Plan, national significance, complexity, mission lifetime, cost and other relevant factors. Class C is medium priority, medium national significance, medium to low complexity and cost while Class D is considered low in all these aspects

Earth Venture Mission - 3

- Cost capped at $190M in FY22 dollars
- Schedule capped at ready for launch no later than February 2027 or 5 years after contract award (whichever is later)
- Risk classification: Payload Class D (low priority, high risk)
- Mission Category 3 (<$250M, medium/low priority)
- Prime Mission Life of less than 3 years
- Access to space –covered in detail in prior presentations
  - AO provided access to space
  - Alternative access to space
- Partnerships (domestic or international) encouraged

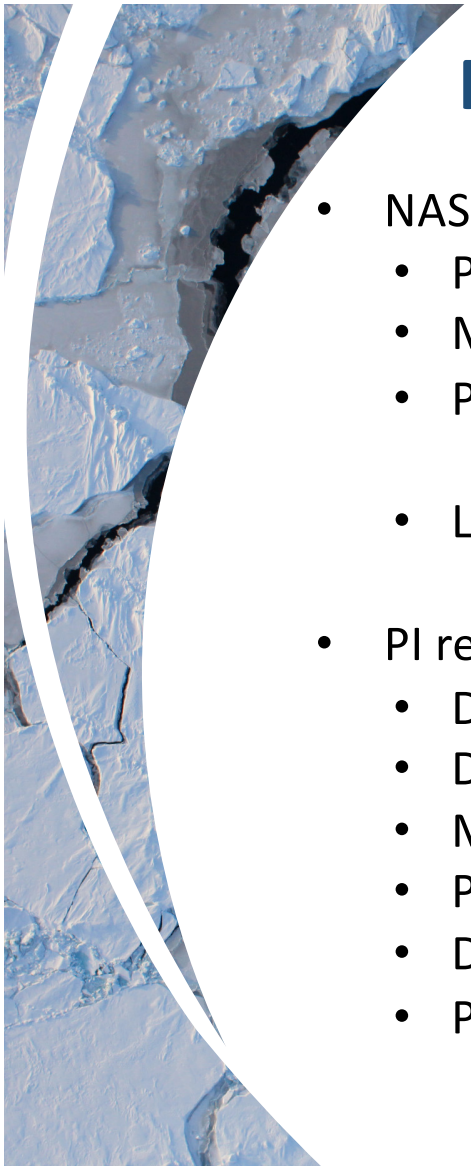
"These missions should focus on fostering revolutionary innovation and on training future leaders of space-based Earth science and applications."
Decadal Survey, 2007

Class D Risk Classification

- SMD has determined that EVM-3 will be a Class D mission
- Tailoring is allowable and is expected
- Decisions by the PI are expected to be in line with a Class D Risk Posture
- Defined in NPR 8705.4, “Risk Classification for NASA Payloads”

NPR 8705.4, Appendix B – Classification Considerations for NASA Class A-D Payloads

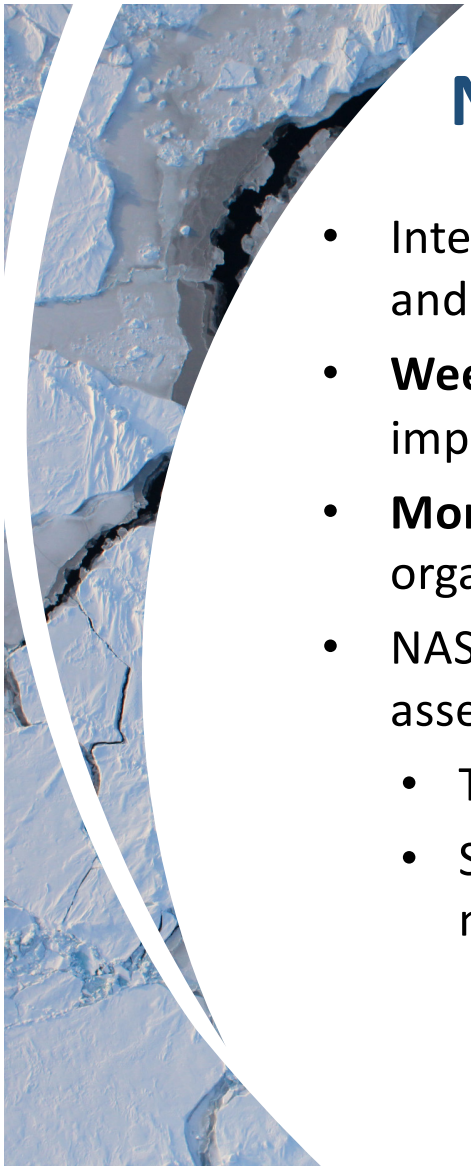
Characterization	Class A	Class B	Class C	Class D
Priority (Criticality to Agency Strategic Plan) and Acceptable Risk Level	High priority, very low (minimized) risk	High priority, low risk	Medium priority, medium risk	Low priority, high risk
National significance	Very high	High	Medium	Low to medium
Complexity	Very high to high	High to medium	Medium to low	Medium to low
Mission Lifetime (Primary Baseline Mission	Long, >5years	Medium, 2-5 years	Short, <2 years	Short < 2 years
Cost	High	High to medium	Medium to low	Low
Launch Constraints	Critical	Medium	Few	Few to none
In-Flight Maintenance	N/A	Not feasible or difficult	Maybe feasible	May be feasible and planned
Alternative Research Opportunities or Re-flight Opportunities	No alternative or re-flight opportunities	Few or no alternative or re-flight opportunities	Some or few alternative or re-flight opportunities	Significant alternative or re-flight opportunities
Achievement of Mission Success Criteria	All practical measures are taken to achieve minimum risk to mission success. The highest assurance standards are used.	Stringent assurance standards with only minor compromises in application to maintain a low risk to mission success.	Medium risk of not achieving mission success may be acceptable. Reduced assurance standards are permitted.	Medium or significant risk of not achieving mission success is permitted. Minimal assurance standards are permitted.
Examples	HST, Cassini, JIMO, JWST	MER, MRO, Discovery payloads, ISS Facility Class Payloads, Attached ISS payloads	ESSP, Explorer Payloads, MIDEX, ISS complex subrack payloads	SPARTAN, GAS Can, technology demonstrators, simple ISS, express middeck and subrack payloads, SMEX



Roles and Responsibilities

- NASA responsibility
  - Program administration
  - Moderate insight, oversight
  - Project plan approval (at KDP C)
    - Reviewed for thoroughness, PI responsible for content choices
  - Limited NASA verification except for flight safety and interfaces

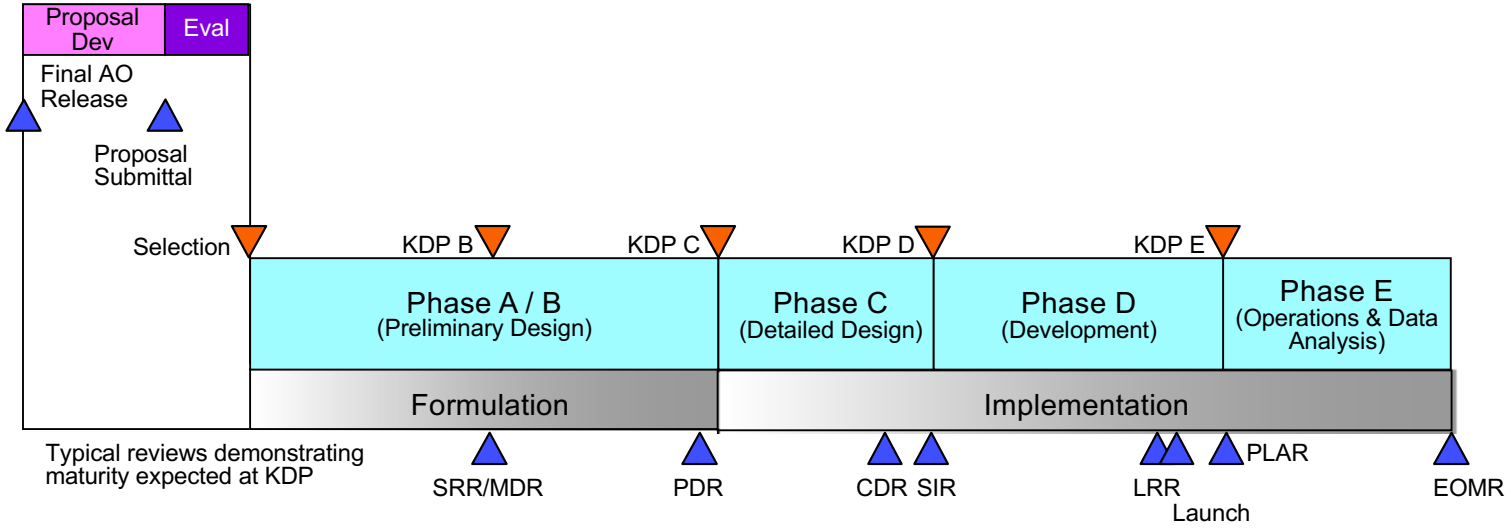
- PI responsibility
  - Defines approach to managing the project
  - Defines standards, processes and practices for mission assurance
  - Mission implementation (approach & execution)
  - Performance/Cost/Schedule/Risk management
  - Design guidelines
  - Peer reviews



NASA Insight

- Interactions between NASA and PI involve participation in **Project Reviews** and **Technical Interchange Meetings**, **Science Team Meetings**
- **Weekly telecons**/meetings keep communication open to understand implementation progress and foster discussion of issues
- **Monthly reporting** to NASA program coordinated with implementing organization reporting process & products
- NASA may enlist the support of **Subject Matter Expert** (SME) to provide assessments
  - Typically done in conjunction with the project's activity or tiger teams
  - SME observation/reporting can be used to support the project decision making process

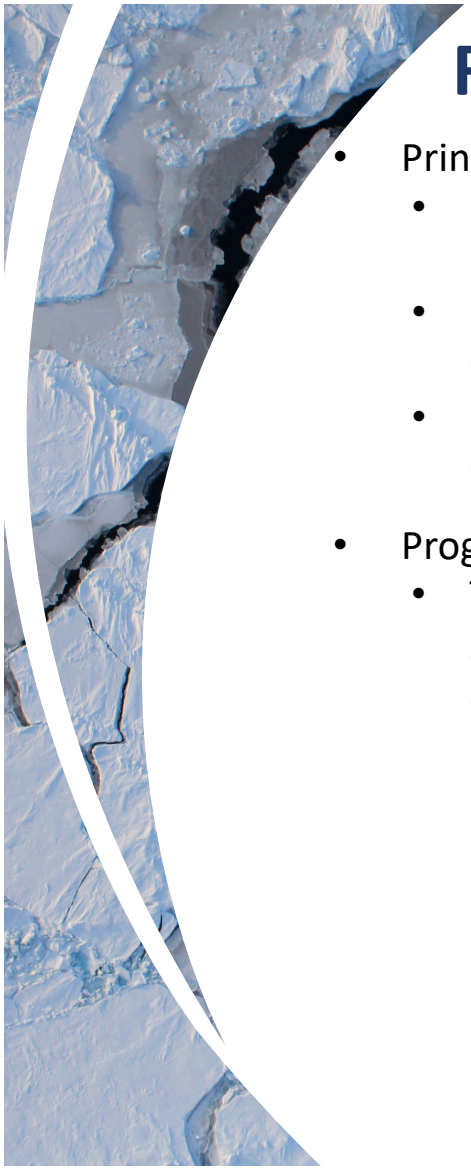
EVM-3 Mission Life Cycle



AO	Announcement of Opportunity
CDR	Critical Design Review
EOMR	End Of Mission Review
KDP	Key Decision Point
LRR	Launch Readiness Review
MDR	Mission Definition Review
PDR	Preliminary Design Review
PLAR	Post Launch Assessment Review
SIR	System Integration Review
SRR	System Requirements Review

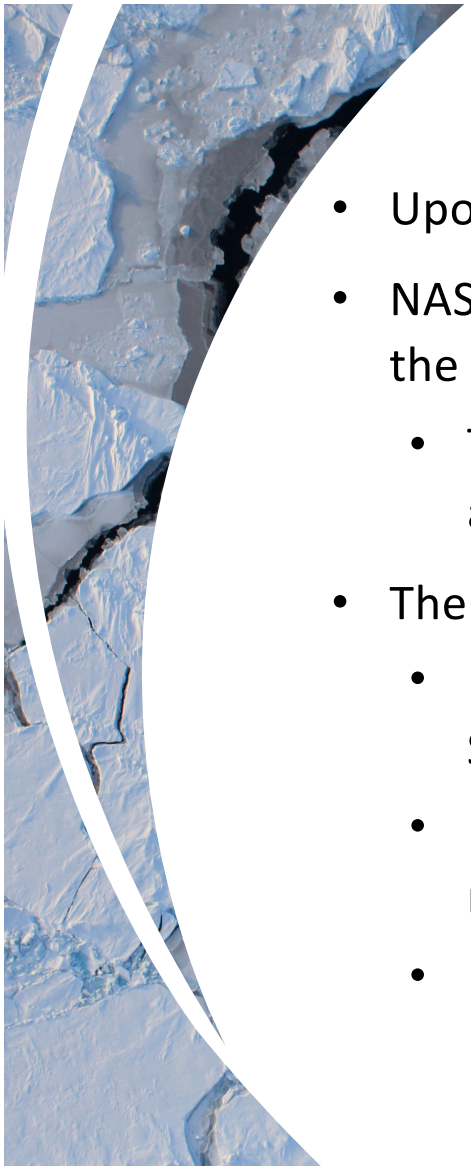
Standing Review Boards

- NASA assesses technical, cost and schedule performance using Standing Review Boards (SRBs)
- Major Reviews
  - Conduct reviews during major transitions in the mission's phases
  - Identify gaps; compare plan vs. execution; cost, schedule and resource assessment
  - Identify and recommend solutions for technical and programmatic problems or issues
- Standing Review Boards
  - Convened by the implementing organization and Decision Authority (Program Office funds)
  - SRB provides report to project, implementing organization, Program Office, HQ
  - SRB only involved in major reviews; not involved in day-to-day implementation
  - Small team (~6 - 8 members)
- Terms of Reference (ToR)
  - Developed in advance of major reviews – with clearly defined entrance and exit criteria
  - Concurred with and signed by Program Office and Project
  - Approved by Decision Authority and implementing organization



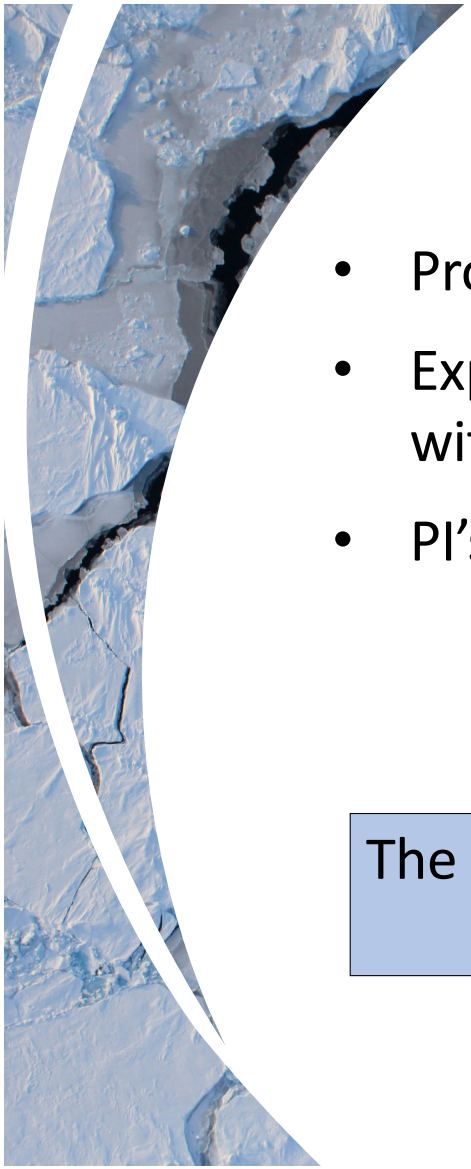
Responsibility for Agreements

- Principal Investigator
  - PI develops and approves all agreements between PI and other organizations (Investigation internal)
  - Interagency agreements developed by PI, in coordination with NASA HQ and Program Office, signed by SMD AA
  - International agreements developed by PI, in coordination NASA HQ and Program Office, signed by Office of International and Interagency Relations (OIIR)
- Program Office
  - Task Plans, Internal Task Agreements (ITA's), or Contracts between the Program Office and PI and implementing organizations established to document understanding of expectations and funding profile
    - Management/Development Approach
    - Scope of Work/Work Description
    - Schedule
    - Cost Estimate
    - Deliverables
    - Period of Performance



Contractual Award Process

- Upon selection, proposal team develops Statement of Work (SOW)
- NASA Mission Manager and selected proposal team, with guidance from the NASA Contracting Officer, finalize the SOW and the deliverables
  - Typically, a 3- to 6-month process from receipt of SOW to contract award
- The NASA Contracting Officer will:
  - Request revised cost proposal and negotiate based upon finalized SOW and contract type
  - Negotiate type of contract/terms and conditions – based on best method to achieve the objective of the statement of work and project
  - Request certified cost and pricing data



Conclusion

- Program management for EVM-3 is focused on project success
- Expectations of insight and oversight will be commensurate with the classification of the mission
- PI's are responsible for managing EVM-3 projects

The ESSP Program Office wishes you all good luck and is looking forward to working with you