Earth Venture Continuity-1
SALMON-3 Program Element Appendix
Pre-Proposal Web Conference
February 28, 2019

David Considine, Program Scientist, EVC-1
Bruce Tagg, Program Executive, EVC-1
Waldo Rodriguez, TMC Evaluation Lead, EVC-1
Diane Hope, Earth System Science Pathfinder Program Office
Dennis McSweeney, Science Division, Office of International and Interagency Relations
Ken Hodgdon, Headquarters Export Control Division, OIIR

Preproposal Telecon Goals

- Brief overview of EVC-1 PEA
- Science evaluation process
- Technical, management, and cost (TMC) evaluation
- Selection process overview
- EVC-1 mission management procedures
- NASA policies for international participation
- NASA policies for export control
- RBI Government-Furnished Equipment (GFE) introduction
- Questions and (hopefully!) Answers

Telecon Agenda

1:00 PM – 1:30 PM	EVC-1 Intro to PEA, Science Evaluation and Selection	David Considine
1:30 PM – 1:50 PM	EVC-1 SALMON-3 PEA TMC Evaluation	Waldo Rodriguez
1:50 PM – 2:05 PM	ESSP EVC-1 Management Approach	Diane Hope
2:05 PM – 2:20 PM	International Cooperation at NASA	Dennis McSweeney
2:20 PM – 2:35 PM	Export Control	Ken Hodgdon
2:35 PM – 2:45 PM	Government Furnished Equipment Intro	David Considine
2:45 PM – 3:30 PM	Questions and Answers	All

Earth Venture Continuity - 1
Science Evaluation and Programmatic Considerations

David B. Considine, PhD

EVC-1 Program Scientist

Earth Science Division, Science Mission Directorate

NASA Headquarters

Outline

- Overview of Earth Venture Continuity and the EVC–1 PEA
- Science Evaluation Process
- Selection Process
- EVC-1 Library

Overview of ESD EV Continuity Program

- Goal of EVC is to *demonstrate* a means to maintain the measurement continuity of important observations without undue impact on ESD flight portfolio.
  - Typically 1 year of operations (Phase E) within program. Operations may be continued outside of EVC program.
- Focus on innovative approaches to sustain measurements at lower cost.
  - Recognizes that initial instrument design did not necessarily consider sustainability over multiple instrument generations.
  - Innovation to reduce initial and long-term cost through technology infusion, programmatic efficiency, instrument producibility, accommodatability, upgradeability.
- PI-led, regularly solicited, cost and schedule constrained, as recommended by the DS and consistent with other EV programs.
- NASA ESD will specify the measurement goal (or goals) in each solicitation.

Overview of ESD EV Continuity Program (cont'd)

- ESD will exercise flexibility to implement EVC in any of the following mission configurations:
  - Full mission implementation (launch costs outside of PIMMC).
  - PI-arranged instrument hosting (accommodation costs outside PIMMC).
  - NASA-provided hosting for a MOO (accommodation outside PIMMC).
- All options may be available in a single AO.
- Planned Cost-Capped Mission Cost: $150 Million
- Payload classification will be Class C or Class D, specified in AO.
- ESD Objective: 3 flights per decade.

Overview of EVC-1 PEA

- EVC-1 PEA is Appendix N of the 3rd Stand Alone Missions of Opportunity Notice (SALMON-3) Announcement of Opportunity.
  - Read both SALMON-3 and the PEA – follow requirements in both.
  - PEA clarifies and extends SALMON-3 AO requirements.
- Focused on maintaining continuity of NASA Earth Radiation Budget climate data records.
  - Follows cancellation of the Radiation Budget Instrument, which was intended to provide this continuity.
  - Some EVC-1 characteristics differ from general EVC due to ERB focus.
  - Earth Radiation Budget continuity is recommended in 2017 DS.
- PI can propose full mission, specify a host of their choice, or propose to fly on a JPSS platform.
  - JPSS has an appropriate spot, this option would follow model of CERES FM-6 accommodation on JPSS-1 (now NOAA-20) platform and planned accommodation of RBI on JPSS-2.
- PIMMC: $150 million (2019$$) cost cap, ESD will cover accommodation or launch costs outside of PIMMC.
- One-step solicitation process, 1 selection is anticipated.
- RBI hardware, etc. offered as GFE.

EVC-1 Characteristics (cont'd)

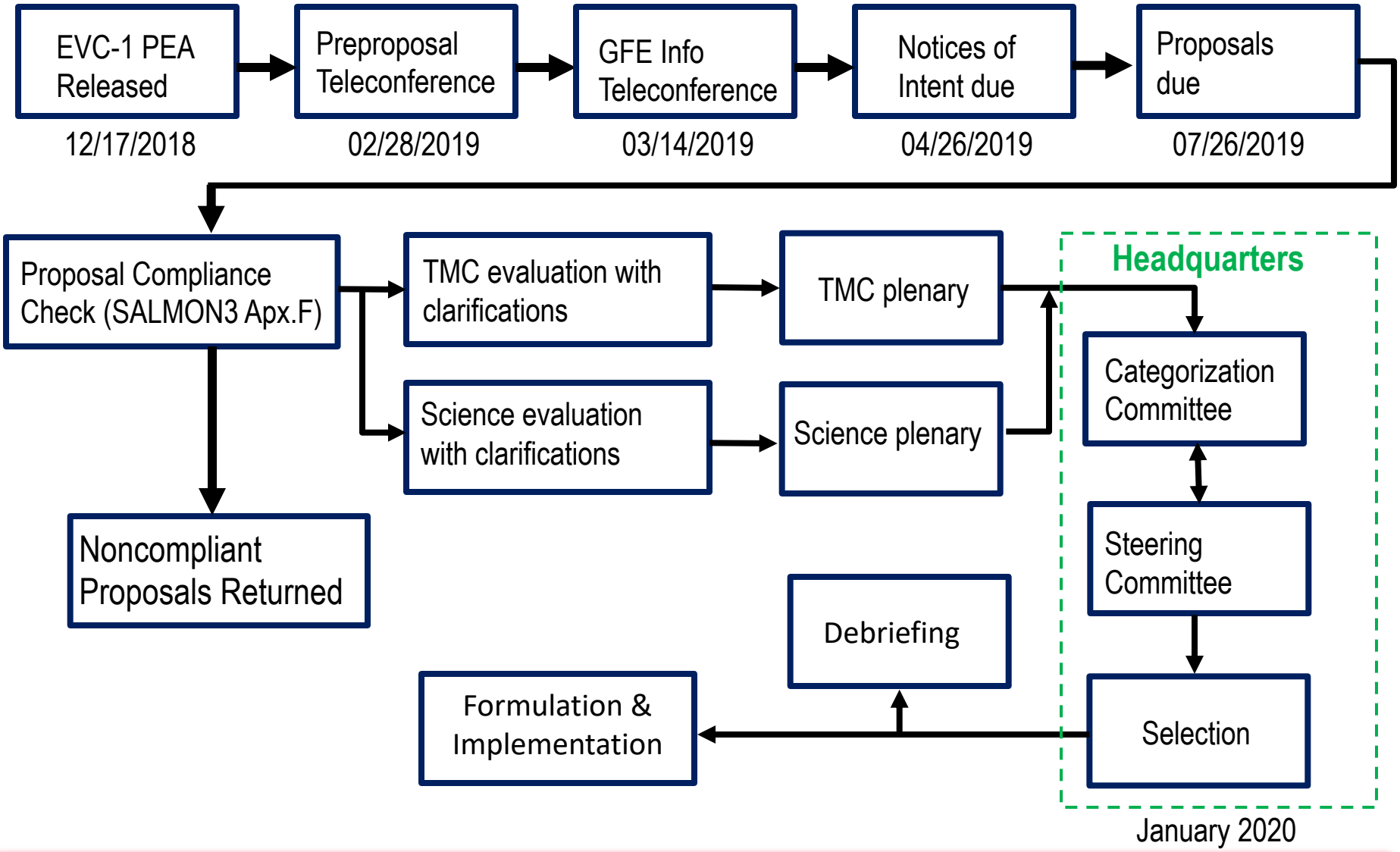
- Class C (not D) payload, 5 year baseline lifetime.
- Phase A to E with one year of Phase E and subsequent handoff to Radiation Budget Science Project at LaRC, which currently produces NASA's ERB climate data records (L1 – L3).
- PI not responsible for higher level data products (> L1) but responsible for ensuring that proposed observing system will enable continuity-preserving higher-level data products.
- PI will propose a science investigation as well.
- Instrument delivery date of January, 2025 for hosted options, on orbit no later than January, 2027 for full mission option.
- An ITAR-free version of the proposal must be submitted via CD to allow inclusion of foreign panelists in Science Panel (as with EVI-5).

PI-Managed Mission Cost (PIMMC)

FMO (JPSS)	FMO (Hosted)	SCM
Costs Within PIMMC		
Instrument	Instrument	Observing system, including instrument(s) and spacecraft
One yr of science operations	One yr of science operations	One yr of science operations
All associated project development costs (PM, SE, documentation, etc.)	All associated project development costs (PM, SE, documentation, etc.)	All associated project development costs (PM, SE, documentation, etc.)
Additional systems required to operate the instrument or collect data	Complete ground system including science processing	Complete ground system including science processing
Software and algorithms	Software and algorithms	Software and algorithms
Transitioning operations to RBSP after one yr of operations	Transitioning operations to RBSP after one yr of operations	Transitioning operations to RBSP after one yr of operations
Costs Outside PIMMC		
Accommodations	Accommodations	Access to Space
Use of the JPSS/EDOS ground systems	Hosting Services	
RBSP support	RBSP support	RBSP support

EVC-1 Evaluation and Selection Process

Proposal Evaluation And Selection Flow Chart



Evaluation Criteria and Clarifications

Evaluation Process is described in Section 7 of the SALMON-3 AO

Evaluation criteria weighting changed from Section 7.2 of SALMON-3 AO:

- Science Intrinsic Merit – reduced from 40% to 30%
- Science Implementation Merit – increased from 30% to 40%
- Technical, Management and Cost – same at 30%

Clarifications:

- As discussed in Section 7.1 of the SALMON-3 PEA, NASA may request clarification of specific points in a proposal.
- Clarifications are related to identification of potential major weaknesses in proposal
- Request and response will be in writing.
- Response to clarification request is limited to pointing to the place in the proposal where the issue is discussed. No further elaboration is allowed.

Proposals are evaluated against criteria and not each other

Clarifications Process

NASA requests clarification of potential major weaknesses identified by the TMC and Science panels in their pre-meetings prior to the final plenary panel meeting.

- NASA requests such clarification uniformly, from all proposers at the same time.
- All requests for clarification from NASA, and the proposer's response, are in writing by email.
- The ability of proposers to provide clarification to NASA is extremely limited, as NASA does not enter into discussions with proposers.
- PIs whose proposals have no major weaknesses are also notified that no weakness were identified.
- The form of the clarifications is strictly limited to a few types of responses:
  - Identification of the locations in the proposal (page(s), section(s), line(s)) where the major weakness is addressed.
  - Noting that the major weakness is not addressed in the proposal.
  - Stating that the major weakness is invalidated by information that is common knowledge and is therefore not included in the proposal.
  - Stating that the analysis leading to this potential major weakness is incorrect and identifying a place in the proposal where data supporting a correct analysis may be found.
  - Stating that a typographical error appears in the proposal and that the correct data is available elsewhere inside or outside of the proposal.

The PI is given at least two full business days to respond. Any portion of the response that goes beyond the bounds for clarification are redacted and not shown to the evaluation panel.

Evaluation of Strengths and Weaknesses

- **Major Strength:** A facet of the implementation response that is judged to be of superior merit and can substantially contribute to the ability of the project to meet its scientific objectives.
- **Major Weakness:** A deficiency or set of deficiencies taken together that are judged to substantially weaken the project's ability to meet its scientific objectives.
- **Minor Strength:** A strength that is worthy of note and can be brought to the attention of Proposers during debriefings, but is not a discriminator in the assessment of merit.
- **Minor Weakness:** A weakness that is sufficiently worrisome to note and can be brought to the attention of Proposers during debriefings, but is not a discriminator in the assessment of merit.

Science Evaluation Panel Proposal Ratings

Excellent:

A comprehensive, thorough, and compelling proposal of exceptional merit that fully responds to the objectives of the AO as documented by numerous and/or significant strengths and having no major weaknesses.

Very Good:

A fully competent proposal of very high merit that fully responds to the objectives of the AO, whose strengths fully outbalance any weaknesses.

Good:

A competent proposal that represents a credible response to the AO, having neither significant strengths nor weakness and/or whose strengths and weaknesses essentially balance.

Fair:

A proposal that provides a nominal response to the AO, but whose weaknesses outweigh any perceived strengths.

Poor:

A seriously flawed proposal having one or more major weaknesses (e.g., an inadequate or flawed plan of research or lack of focus on the objectives of the AO).

Science Panel Intrinsic Merit Evaluation Factors (30%)

- **Factor A-1. Compelling nature and priority of the proposed investigation's science goals and objectives.**
  Clarity of the goals and objectives; how well the goals and objectives reflect program, Agency, and national priorities; the potential impact of the investigation on program, Agency, and national science objectives; potential for fundamental progress, as well as filling gaps in our knowledge relative to the current state of the art.
- **Factor A-2. Programmatic value of the proposed investigation.**
  Unique value of the investigation to make scientific progress in the context of other ongoing and planned missions; the relationship to the other elements of NASA's programs; how well the investigation may synergistically support ongoing or planned missions by NASA and other agencies; and the necessity for a space mission to realize the goals and objectives.
- **Factor A-3. Likelihood of science success.**
  How well the anticipated measurements support the goals and objectives; the adequacy of the anticipated data to complete the investigation and meet the goals and objectives; and the appropriateness of the mission requirements for guiding development and ensuring success.
- **Factor A-4. Science, exploration, or technology value of the Threshold Investigation.**
  Intrinsic value of the Threshold Investigation using the standards in the first factor of this section and whether that value is sufficient to justify the proposed cost of the investigation.

Science Panel Implementation Merit Evaluation Factors (40%)

Factor B-1. Merit of the instruments and investigation design for addressing the science goals and objectives.
Degree to which the proposed investigation will address the goals and objectives; the appropriateness of the selected instruments and investigation design for addressing the goals and objectives; the degree to which the proposed instruments and investigation can provide the necessary data; and the sufficiency of the data gathered to complete the science, exploration, or technology investigation.

Factor B-2. Probability of technical success.
Includes maturity and technical readiness of the instruments or demonstration of a clear path to the necessary maturity; adequacy of the instrument(s) development plan within the proposed cost and schedule; plan robustness, including recognition of risks and risk mitigation plans; the likelihood of success in developing any new technology constituting an untested advance in the state of the art; the ability of the development team - both institutions and individuals - to successfully implement those plans; and the likelihood of success for both the development and the operation of the instruments within the investigation design.

Factor B-3. Merit of the data analysis, data availability, and data archiving plan and/or sample analysis plan.
Includes the merit of plans for data analysis and data archiving to meet the goals and objectives of the investigation; to result in the publication of discoveries in the professional literature; and to preserve data of value to the research and development community. Considerations include assessment of planning and budget adequacy and evidence of plans for well-documented, high-level data products and software usable to the entire research and development community; assessment of adequate resources for interpretation of data; adequacy of the planning and budget; reporting science results in the professional literature (e.g., refereed journals); and assessment of the proposed plan for the timely release of the data to the public domain for enlarging its impact.

Factor B-4. Science resiliency.
Includes both developmental and operational resiliency. Developmental resiliency includes the approach to descoping the Baseline Investigation to the Threshold Investigation in the event that development problems force reductions in scope. Operational resiliency includes the ability to withstand adverse circumstances, the capability to degrade gracefully, and the potential to recover from anomalies in flight.

Factor B-5. Probability of investigation team success.
Evaluated by assessing the experience, expertise, and organizational structure of the investigation team and the experiment design in light of any proposed instruments. The role of each Co-I and collaborator will be evaluated for necessary contributions; the inclusion of Co-Is or collaborators without a well-defined and appropriate role may be cause for downgrading of the proposal.

EVC-1 Specific Science and TMC Evaluation Factors

Factor B-8. Merit of the calibration capabilities and calibration plan.

This factor includes evaluation of the pre-flight calibration facilities, the pre-flight calibration plan (including the plans for acquiring and archiving appropriate pre-flight calibration data for later use as well as the value of the acquired calibration data), the on-board calibration facilities, and the on-board calibration plan. Evaluation of the on-board calibration plan should include the description of how any on-board calibration equipment can be used to meet the objective of providing data product stability sufficient to seamlessly continue the NASA ERB data record as described in Section 2.

Factor B-9. EVC specific factor.

This factor includes consideration of innovations in design that facilitate maintaining continuity of the ERB, of design features that facilitate the accommodation of a proposed instrument on either the proposed platform or a JPSS platform as appropriate, of features (such as reliance on easily available components) enhancing the producibility of the instrument and future copies, and of design features which would facilitate capability-enhancing technology infusion in future copies.

Factor C-6. (Technical, Management and Cost Feasibility of the Proposed Investigation Implementation) includes an additional evaluation factor.

This factor includes consideration of innovations in design or processes that reduce cost, of the potential cost of future copies of the proposed observing system that will be necessary to maintain measurement continuity in the future, of the design features that facilitate the accommodation of a proposed instrument on either the proposed platform or a JPSS platform as appropriate, of features (such as reliance on easily available components) enhancing the producibility of the instrument and possible future copies, and of design features which would facilitate cost-reducing or capability-enhancing technology infusion in future copies.

Decision-making process at HQ

- Categorization Committee
  - Multiday meeting of Program Scientists and Program Executives to "Categorize" the investigation from Category 1 (recommended) to Category 4 (not recommended)
  - Categorization based on panel summary evaluations
- Steering Committee
  - Multiday meeting of Program Scientists and Program Executives
  - Reviews Categorization Committee Categorizations
- Selection Official Decision
  - Multiple meetings of Earth Science Management
  - Final presentation to SMD leadership
  - Selection official is AA for SMD, currently Thomas Zurbuchen

Category Definitions

- Category I. Well conceived and scientifically and technically sound investigations pertinent to the goals of the program and the AO's objectives and offered by a competent investigator from an institution capable of supplying the necessary support to ensure that any essential flight hardware or other support can be delivered on time and data that can be properly reduced, analyzed, interpreted, and published in a reasonable time. Investigations in Category I are recommended for acceptance and normally will be displaced only by other Category I investigations.
- Category II. Well-conceived and scientifically or technically sound investigations which are recommended for acceptance, but at a lower priority than Category I.
- Category III. Scientifically or technically sound investigations which require further development. Category III investigations may be funded for development and may be reconsidered at a later time for the same or other opportunities.
- Category IV. Proposed investigations which are recommended for rejection for the particular opportunity under consideration, whatever the reason.

Selection and Notification

- The Selecting Official bases selection on the combined reviews, the categorization, and *other issues such as programmatic needs or budgetary considerations*
- Selected PIs will be notified by phone and then by letter.
- All teams are entitled to a debriefing, either in person or by telephone.
  - Written debriefs will be provided to the teams in concert with the face-to-face or telephonic discussions.

EVC-1 Homepage and Library

Proposers are encouraged to periodically check the EVC-1 Acquisition Homepage at:

https://essp.larc.nasa.gov/EVC-1/

This site provides updates and any PEA addenda during the solicitation process. It provides links to the PEA, any pertinent announcements, PowerPoint presentations for the Preproposal Conference (when available), EVC-1 questions and answers, and the list of potential teaming partners.

The EVC-1 Library is at: https://essp.larc.nasa.gov/EVC-1/evc-1_library.html

This provides additional regulations, policies, and background information related to the solicitation. Examples of documents and links in the EVC-1 Library are:

- EVC Scientific Working Group recommendations for EVC-1 measurement and instrument characteristics.
- Information on JPSS and its interfaces.
- Information on RBI hardware and GFE.
- Many other important and relevant documents.

Questions and Comments

All questions pertaining to the EVC-1 PEA MUST be addressed to:

David Considine
Earth Venture Continuity-1 Program Scientist
Earth Science Division
Science Mission Directorate
NASA Headquarters
Washington, DC 20546

Preferably by email at:

David.B.Considine@nasa.gov
Subject line to read "EVC-1 PEA Question"