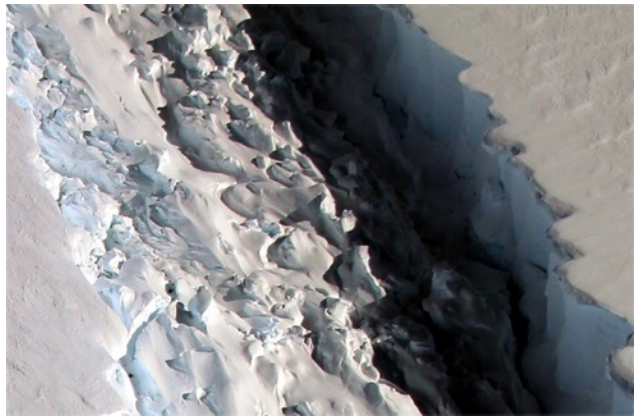
SCIENCE






Surface Biology and Geology Designated Observable

Charles Miller, JPL

Feb 13, 2020
ECOSTRESS STM, Ventura CA

Summary

- NASA Surface Biology & Geology (SBG) Designated Observable is conducting a pre-Phase A Architecture Study (Fall 2018 – Spring 2021)
- SBG targeting Mission Confirmation Review (MCR) in Fall 2021
- SBG will benefit tremendously ECOSTRESS advances in TIR imaging
- SBG will extend high-resolution TIR imaging into the 2030s
- SBG Community Workshop: 27-29 May 2019, Pasadena CA




SBG Observation & Product Priorities Cross 5 Earth Science Focus Areas

- NASA/DS direction: SBG Shall Not Exceed $650 M total cost to NASA
- **DS gave clear direction on SBG Observing priorities:**
  - **Terrestrial vegetation physiology, functional traits, and health**
  - **Inland/coastal aquatic ecosystems physiology, functional traits, health**
  - **Snow and ice accumulation, melting, and albedo**
  - **Active surface changes (eruptions, landslides, evolving landscapes, hazard risks)**
  - **Effects of changing land use on surface energy, water, momentum, and C fluxes**
  - **Managing agriculture, natural habitats, water use/quality, and urban development**
- SBG Science and Applications Traceability Matrices (SATM)
  - Science Objectives have traceability capability categories and applications
  - Observing architectures options, with associated capability categories, are mapped back to Science Objectives
- Value Framework will assess each candidate architecture by performance, cost and risk value criteria
- Selected architectures from the Value Framework will then be further developed in preparation to support an MCR

SBG: One Mission, Diverse Science & Applications

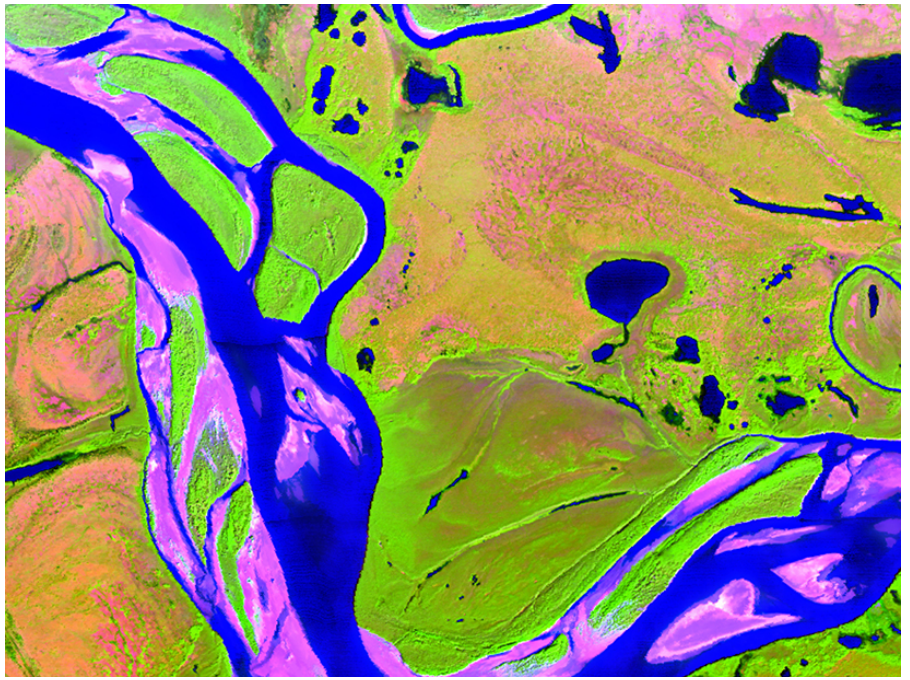
- Ecosystems (E)
  - Terrestrial
  - Coast and inland
- Hydrology (H)
  - Snow
  - Evapotranspiration
- Solid Earth (S)
- Weather (W)
- Climate (C)
- Applications (A): all Focus Areas

SBG Is the Successor to HyspIRI

2007 Decadal Survey: HyspIRI

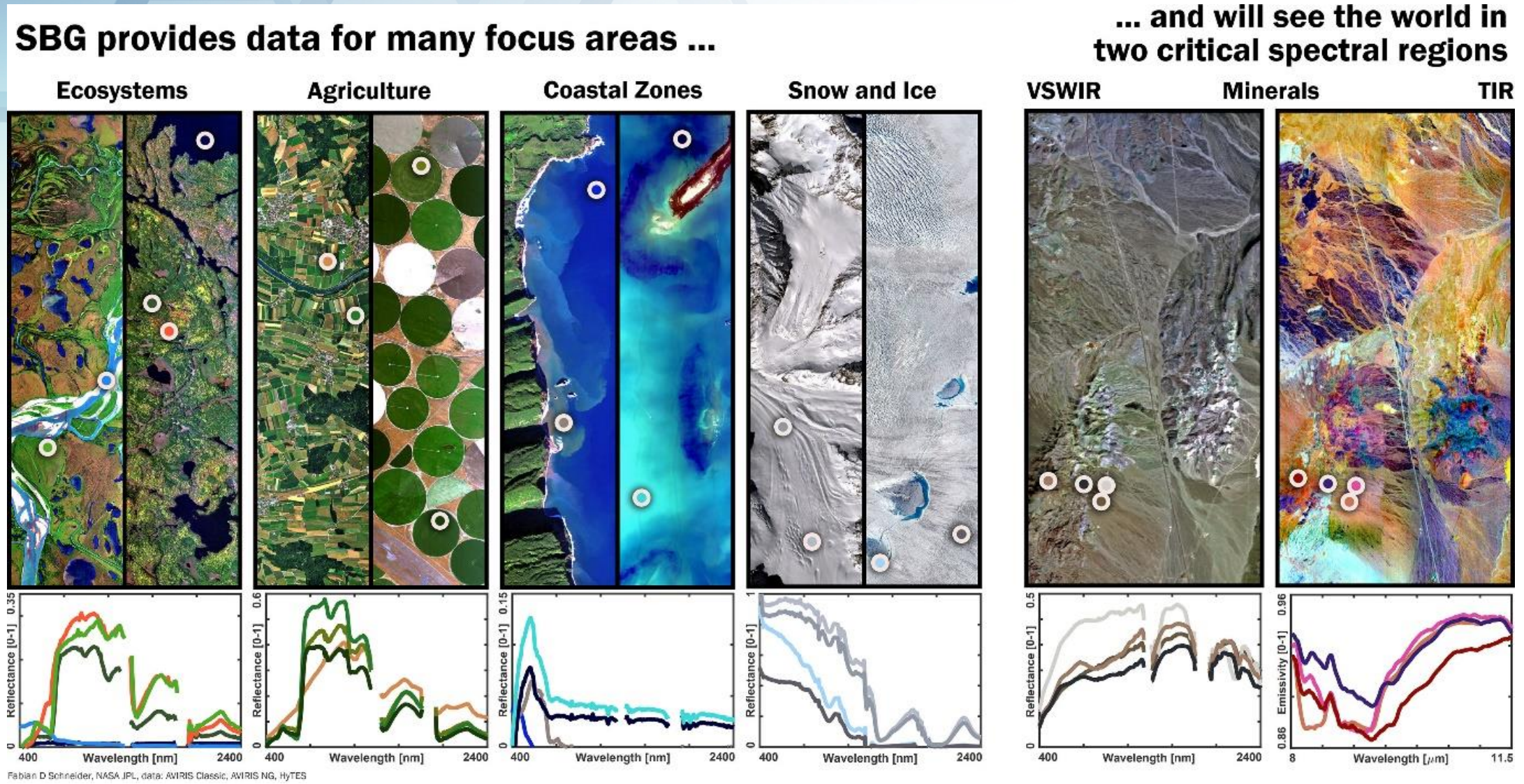
https://hyspiri.jpl.nasa.gov/

2018 Decadal Survey: SBG



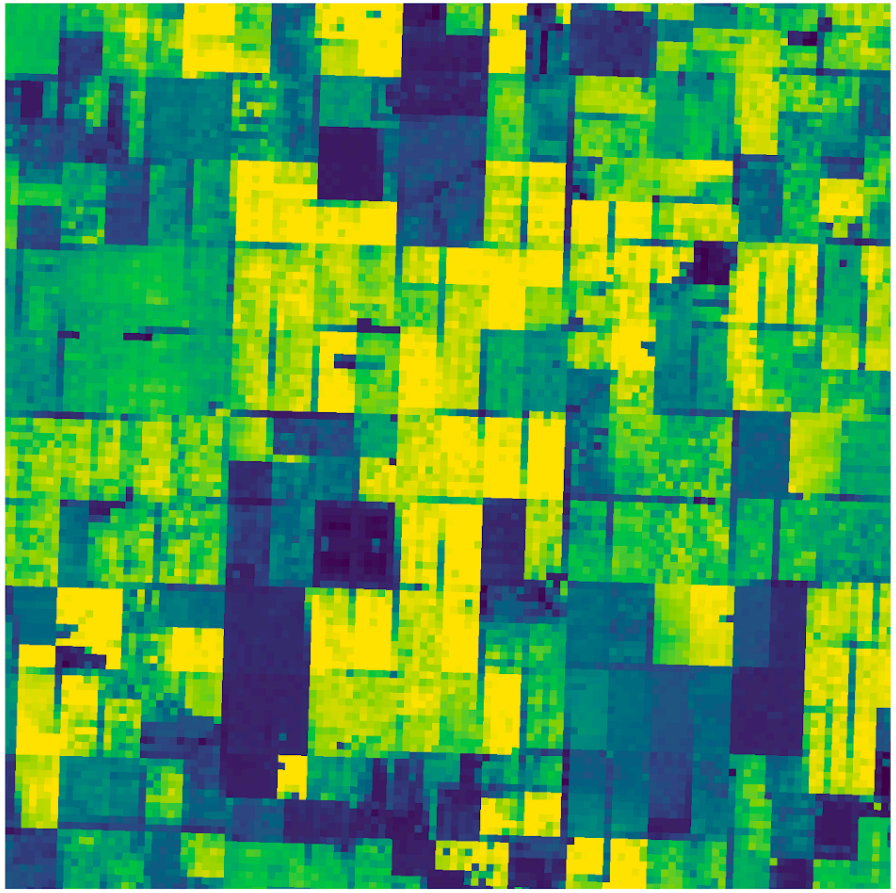
https://sbg.jpl.nasa.gov/

SBG Will Have Both VSWIR and TIR Sensors

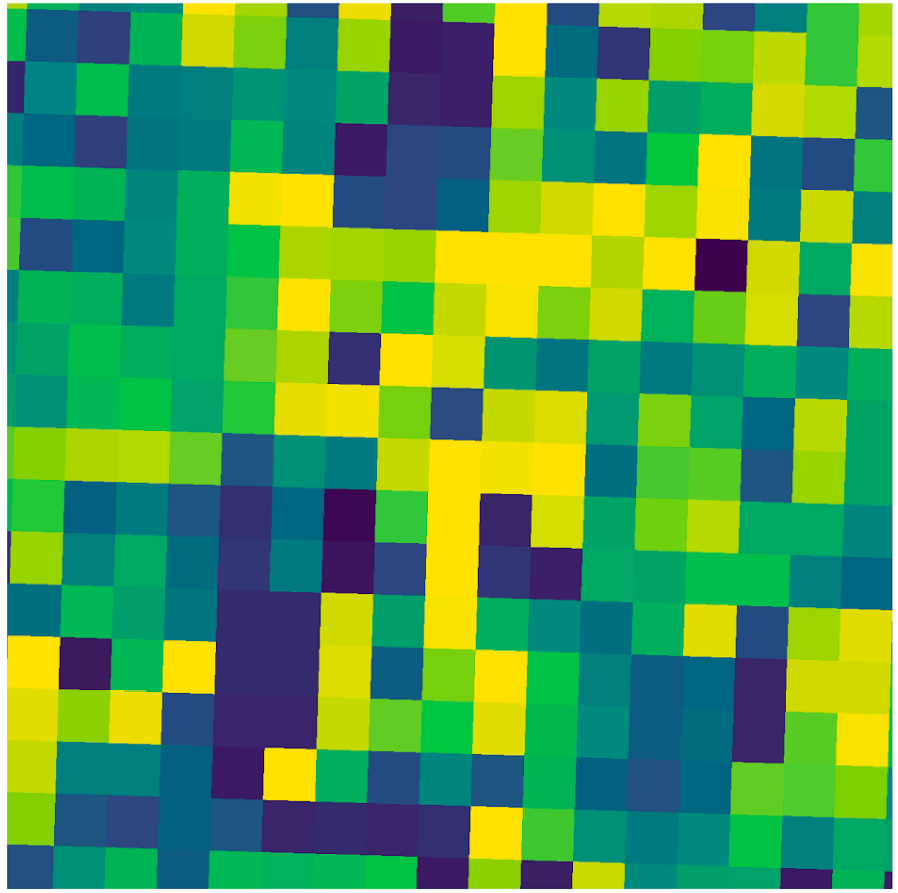


Benefits of High Spatial Resolution TIR for Agricultural Management (ET)

ECOSTRESS 70 m Resolution

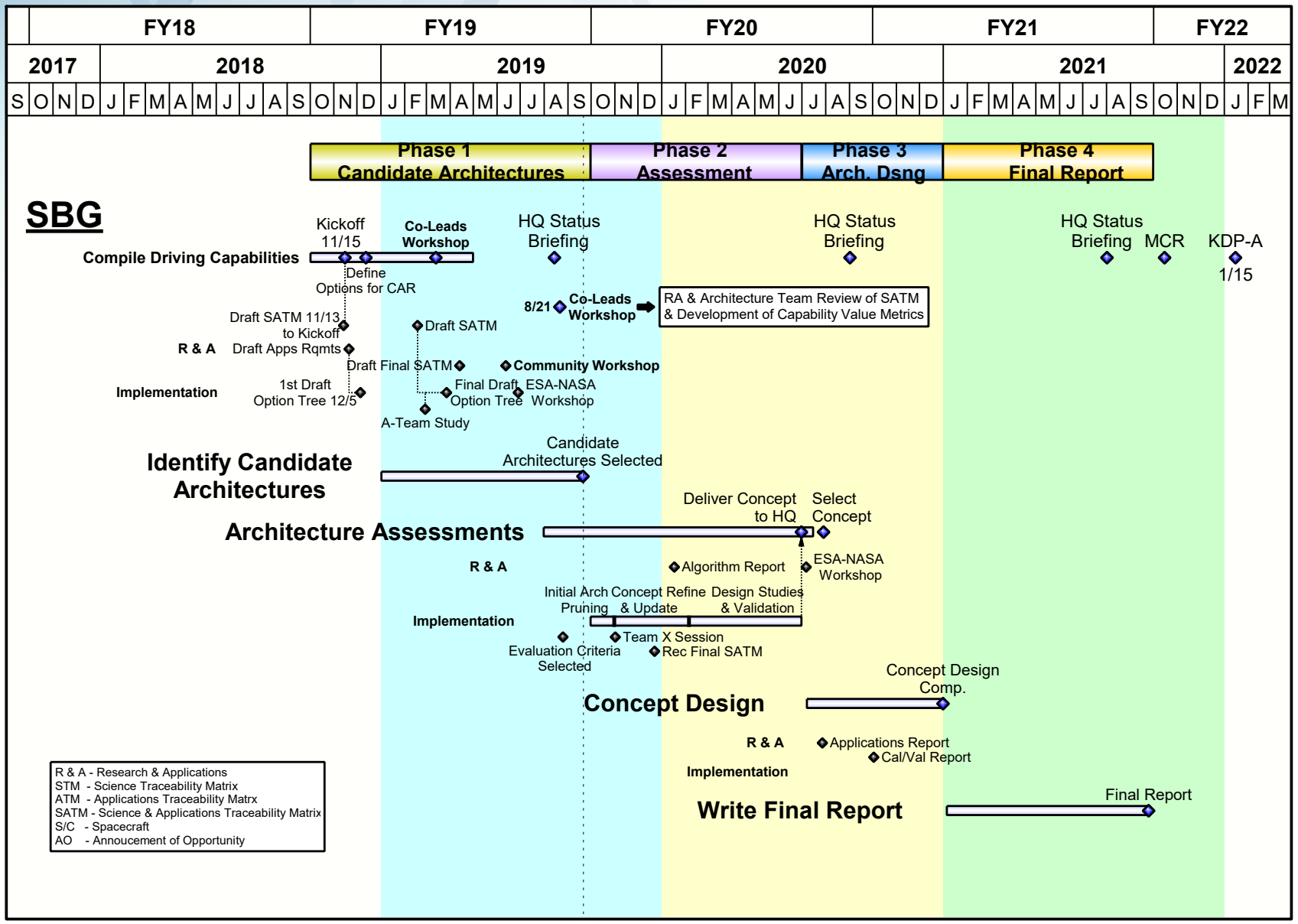


MOD17 500 m Resolution

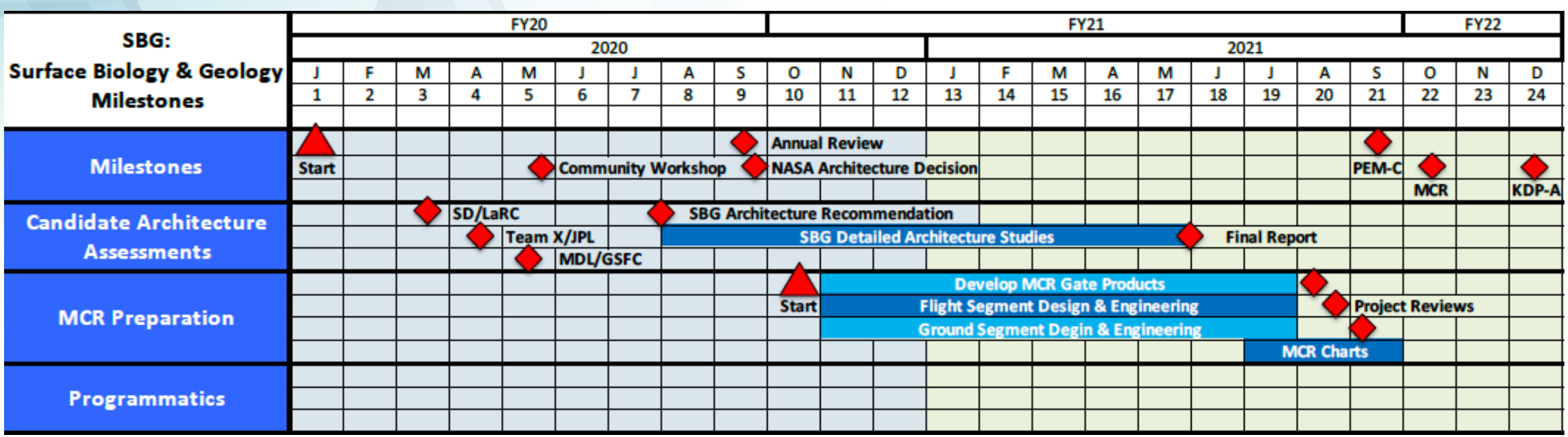


J Fisher (JPL)

SBG Integrated Schedule Enables MCR/KDP-A in Fall 2021



Roadmap to SBG Mission Confirmation



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