



Artist Concept



SOFIA Program Update

Eddie Zavala, Program Manager

SOFIA Users Group Meeting #8

November 18, 2015





Recent Program Status



- FY15 Program performance was exceptional
 - Rough start with reduced budget appropriation in December 2014
 - Completed Cycle 2 science (93% dispatch rate, 280 research hours)
 - Maintained priority to fully sustain 2nd Generation Science Instrument development effort
 - Completed development of single-channel cryo-cooler system and improved Observatory mission system software
 - Completed commissioning of EXES and upGREAT science instrument capabilities
 - Completed Cycle 4 Call for Proposals and selection (559 Cfp hours, 852 total^{SUG #8} research hours, full



Recent Program Status



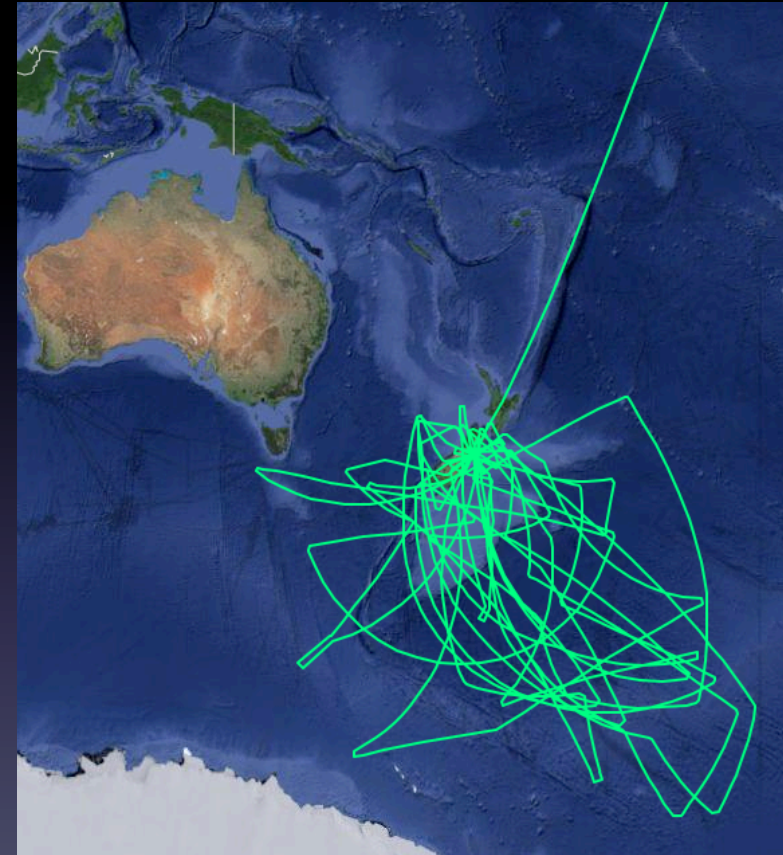
- FY15 Program performance was exceptional (continued)
 - Started Cycle 3 Science with plans to provide ~550 research hours
 - Reduced fuel costs and improved financial plan (April 2015) allowed for restoration of all unfunded science flights
 - Successfully completed Southern Hemisphere deployment with a 4-fold increase in deployed science instrument capability
 - Successfully completed Target of Opportunity (ToO) during deployment with Pluto occultation observation within 2 weeks of New Horizons fly-by



2015 SOFIA Southern Hemisphere Deployment Summary



- Six weeks duration, successfully completed 14 of 18 science flights
- US and German ambassadors visited SOFIA in NZ on July 17th
- Four science instruments – 3 US, 1 German (*the first time any SIs have been swapped out on the aircraft while away from Palmdale*)
 - **FORCAST Mid-IR Camera and Grism Spectrometer**
 - 10 Flights (7 completed, 3 were cancelled: 1 due to weather & 2 due to mechanical problems)
 - 11 GI programs with 37 targets
 - 1 GTO program with 5 targets
 - 85 science hours
 - **FLIPO combined visible and near-IR photometer/cameras**
 - 2 flights for Pluto occultation (both completed, including practice flight)
 - 9 science hours
 - **GREAT heterodyne sub-mm spectrometer**
 - 6 flights (5 completed, 1 cancelled due to weather, 1 flight return-to-base due to Telescope power failure)
 - 11 GI programs with 15 targets



One of the deployment highlights was the nearly perfect execution of Pluto occultation observation!



Recent Program Status



- In response to science community feedback, FY 16 Budget revision (April 2015) included the implementation of an improved, optimized plan for improved scientific productivity
 - New, streamlined aircraft maintenance plan with reduced schedule
 - Sustained 3-flight per week capacity with occasional surges to 4-flights per week
 - Increased GI support in Cycle 4 call by 3X (~ \$10K/hour)
 - 3rd Gen and 4th Gen Science Instrument funding profiles
 - Review and prioritization of future (science-driven) improvement projects



Budgetary Outlook



- The Program budget for FY16 has yet to be determined and passed by Congress
- Preliminary indications from both the House and Senate indicated Congressional intent to fully restore the SOFIA budget
- Program Cycle 4 schedule is based on the anticipation of a restored budget (\$85.2 M) by December 2015
 - Maintain full capacity with 106 flights, 852 research hours, and a 6-week, 2-science instrument deployment
 - Continued 2nd Gen and 3rd Gen SI funding profiles
 - Prioritized Improvement Projects as budget capacity permits
- Pending the final FY16 budget appropriation, SOFIA is



FY16 Improvement “Projects”



- **Telescope Assembly**
 - Spares/upgrades (SMA, NESC, MCP/TRC, SMCU, cabling, scaffolding)
 - Reactivation of instrumentation
 - AMD software acquisition
 - Image quality improvements
 - Investigation of sources of stray light in cavity
 - WFI/FFI upgrades
- **Aircraft modifications**
 - Controller / Pilot Data Link Communications (CPDLC)
 - Cavity Environmental Control System (CECS) dryer upgrade
- **Mission Systems**
 - Water Vapor Monitor algorithm and validation analysis
- **Science Instrument**
 - Cryocooler Phase 2 concept and design
 - EXES/FORCAST SI computer upgrades
- **Ground Systems**
 - Assessment of future DCS upgrades



Program Office Transition



- Program Management Transition from AFRC to ARC was completed on October 1, 2015
 - Full endorsement by Standing Review Board (SRB) based on demonstrated compliance to transition criteria
 - Unprecedented recommendation for out-of-board approval; NASA HQ concurred and approved
- Program Management will focus on ensuring science productivity
 - Performance measurement against goals

Scientific Productivity Goals



- A productive science investigation initiates with the response to a call for proposals
 - Goal: Achieve an over-subscription rate of 5 for the Cycle 5 Call for Proposals
- Availability of relevant scientific instruments
 - Goal: Complete acceptance of remaining 1st Generation facility-class science instruments (FORCAST, FIFI-LS) by December 2015
 - Goal: Complete 2nd Generation Science Instrument (HAWC+) Commissioning in Fall 2015
 - Goal: Complete selection and project start of 3rd Generation Science Instrument in Fall 2015

Scientific Productivity Goals



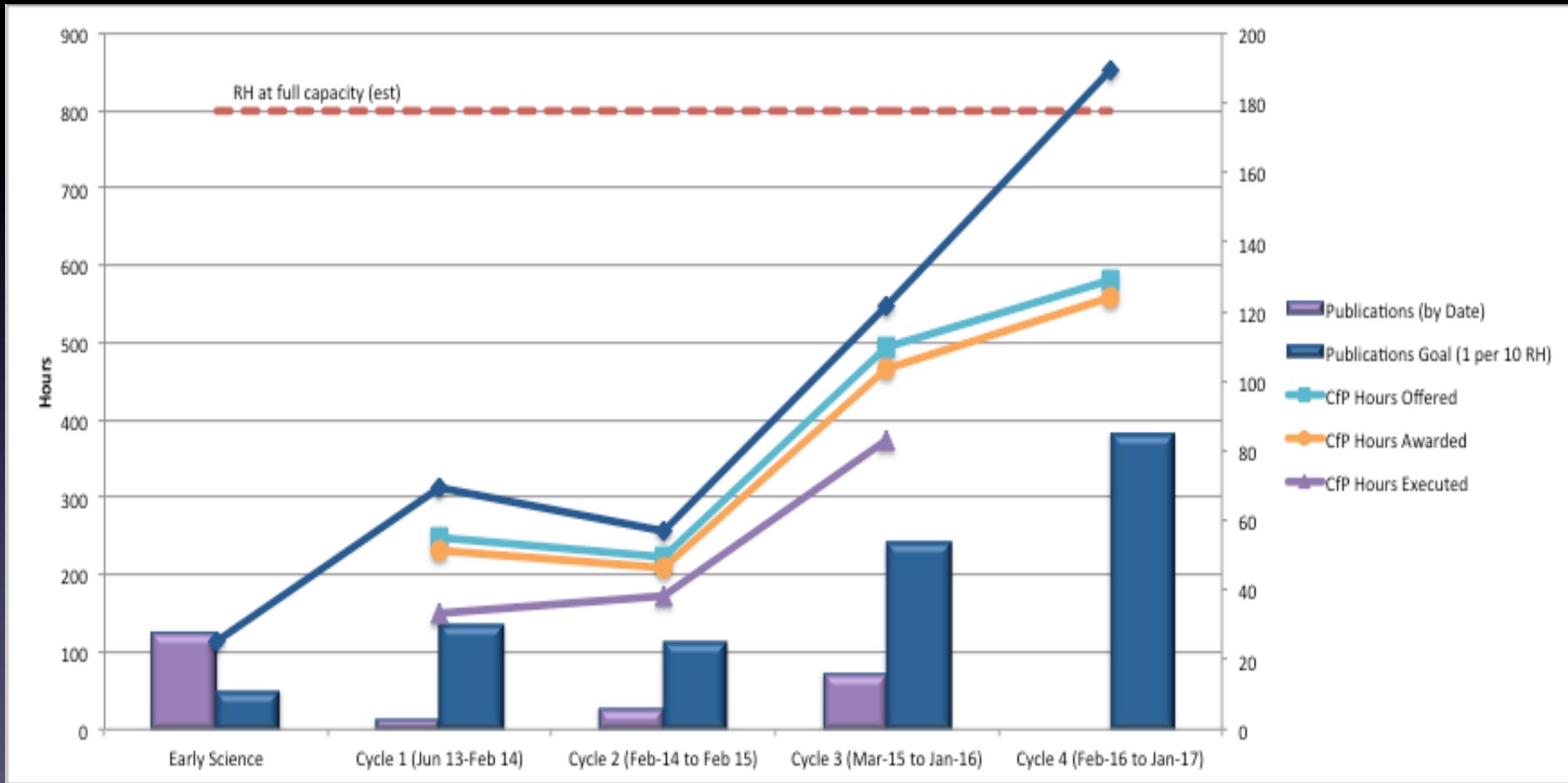
- Efficient and reliable flight opportunities
 - Goal: Sustain 3 flights per week with overall dispatch reliability of 90%; ~800 research hours per year
 - Goal: Provide 80% of planned annual research hours with an average of 8.0 research hours per flight
- Rapid production of science ready data from reliable and accurate pipeline software
 - Goal: Level 2 data processed and archived within 5 working days
 - Goal: Level 3 data processed and archived within 15 working days
 - Goal: On-time public release of all science data after 1-year proprietary period SUG #8

Scientific Productivity Goals



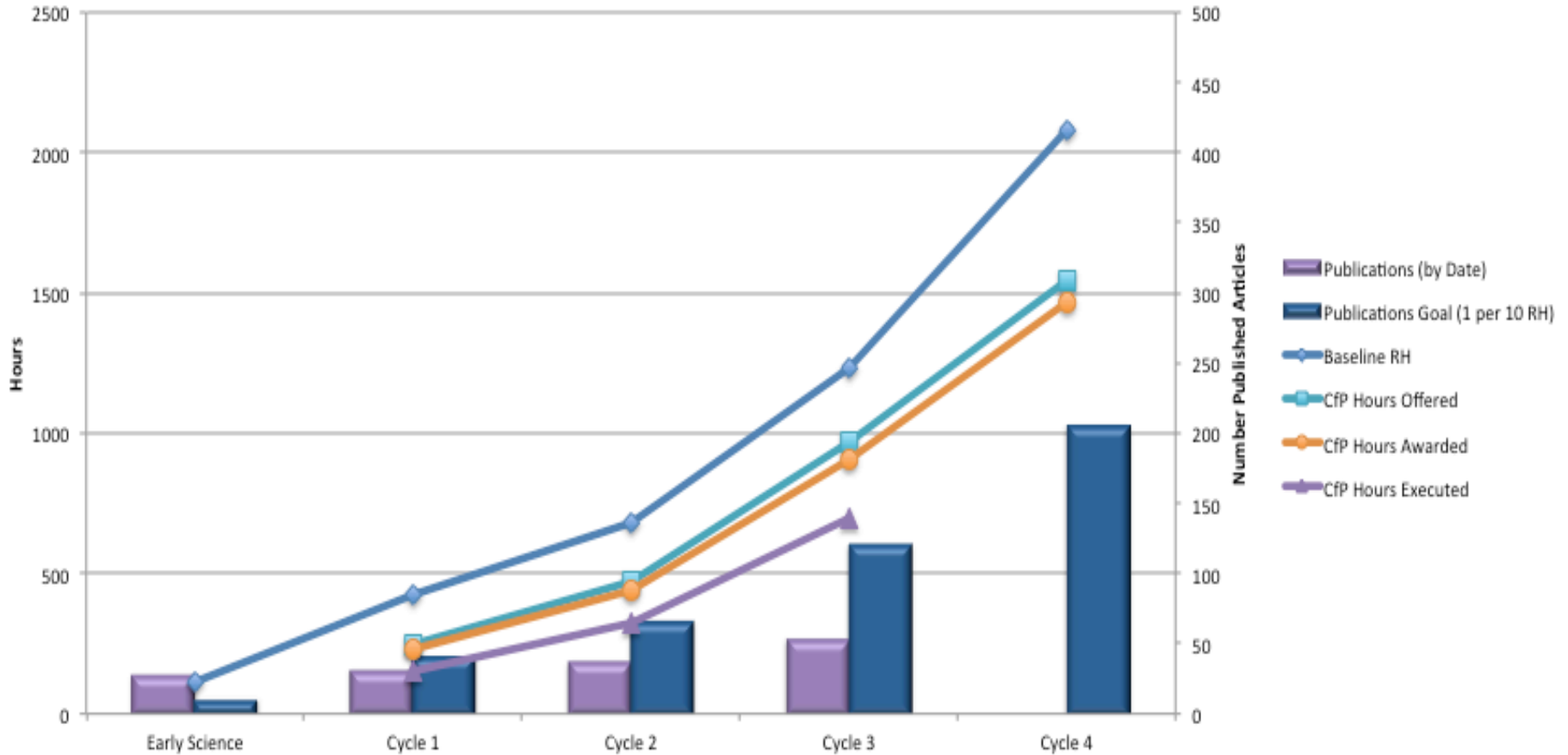
- Sufficient funding to investigators for the analysis of the results with continued funding rate ~\$10K/hour
- The publication and dissemination of unique and impactful science results and increased publication rate
 - Goal: Establish an average publication rate of 5–7 science papers per month

SOFIA Science Productivity By Science Cycle





SOFIA Science Productivity Cumulative Since Early Science



It is imperative that publications increase at a rate commensurate with the increase in observation hours

The SUG can play an influential role in helping SOFIA achieve science productivity goals and demonstrate science relevance oriented toward the current scientific landscape

