

Cycle 8 Planning and Scheduling

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The Science-Driven Planning Process

- There are two main types of planning tool, the Cycle Scheduler (CS) and Short Term Scheduler (STS, detailed flight-by-flight planning)
- In general, the CS looks at the visibilities of Priority 1 and Priority 2 targets for each instrument and decides which instrument should be on the telescope which week to maximize completion
- We then use the STS to create actual flight plans for each flight within a given instrument series
 - The STS employs a “greedy algorithm” that will schedule the highest priority observations first
 - Thus, generally, the flight plans contain less high-priority science as the series progresses, and we utilize the flights near the end of a series as contingency dates
- If flight losses go well beyond the number of contingency flight opportunities, we will often replan the series to maximize completion of P1 and P2 targets

How we got here

- Our process so far was to first plan a return-to-flight set of flight plans out of Palmdale, and options for a NZ summer deployment
- Mar-Apr flight planning concentrated on modifying the nominal Cycle 8 schedule to account for schedule slips
- By end of May, it was clear we needed to completely replan Cycle 8 in order to maximize science and lessen the impact of lost flight opportunities

Original Cycle 8 plan

- OC8A EXES April 27 – May 7 (8 flights)
- OC8B FIFI-LS May 11 – May 21 (8 flights)
- OC8C FORCAST May 26 – June 5 (9 flights)
- OC8D HAWC+ June 9 – June 12 (4 flights)
- OC8E GREAT June 17 – June 18 (2 flights)
- OC8F GREAT NZ Deployment July 1 – Aug 15 (28 flights)

Where are we now

- *If we return to flight July 8 as planned, we will have already lost 36 flight opportunities in Cycle 8*
- We identified the latest we could deploy with GREAT to NZ and still complete our highest priority science
- We wrapped complete cycle replans around that and a 12-week maintenance C-Check start at the beginning of April
- We simulated multiple scenarios for contingency, including no NZ deployment at all

Final deployment options considered

	6-Jul	13-Jul	20-Jul	27-Jul	3-Aug	10-Aug	17-Aug	24-Aug	31-Aug	7-Sep	14-Sep	21-Sep
A2: current plan	HA	HA	HA			GR	GR	GR	GR	GR	GR	
B: late deploy w/GREAT	HA	HA	HA	FI				GR	GR	GR	GR	
C: late deploy w/HAWC+	HA	HA	HA	FI	FI			HA	HA	HA	HA	
D: late deploy w/FIFI	FI	FI	FI	HA	HA	HA		FI	FI	FI	FI	
F: no deployment	HA	HA	HA	FI	FI	FO	FO	HA	HA	HA	EX	EX



PMD Flight Week



NZ Flight Week



Ferry Week

Estimates of Completion Statistics with no NZ Deployment with GREAT

Summer flights out of PMD. These were made by CS, not STS, so are estimates.

- FORCAST: 100% P1 90% P2
- HAWC+: 100% P1 75% P2
- FIFI-LS: 86% P1 88% P2
- EXES: 86% P1 100% P2
- GREAT: 65% P1 55% P2

Original Cycle 8 baseline for ALL INSTRUMENTS 97% P1, 89% P2

The only instrument completion affected by no NZ deployment is obviously GREAT since a large part of the target pool was selected for southern targets