

# South Pole Logistics

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NSF Mid-Term Review  
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# Outline

- Coordination with ASC
- Post-COVID
- Personnel
- Cargo
- 2024-25 planning



# Season Planning with ASC

- Sheryl Seagraves, Paul Sullivan, Leah Street, Tim Ager, Bill Coughran
- 3-4 meetings a year
- Key in-person meeting to discuss plans for the upcoming season
- A lot of communication after SIP submission to iron out the details
  - Cargo tracking updates
  - PQ status

# Challenges of Post-COVID On-site Support

- On-site support is great with what's available
- Personnel support sometimes limited or none
  - Carpenters, electricians, heavy equipment operators, etc.
- Heavy equipment support sometimes limited or none
  - Parts for maintenance delayed, limited mechanics on-site, etc.



# Personnel – typical scheduling

	November				December				January			
	wk-1	wk-2	wk-3	wk-4	wk-1	wk-2	wk-3	wk-4	wk-1	wk-2	wk-3	wk-4
Winter Over												
Winter Over												
SME												
helper												
SME												
helper												
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helper												
SME												
helper												
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helper												

## Operational Notice

- 9 beds
- 12 deployments

# The “Flight Gap”

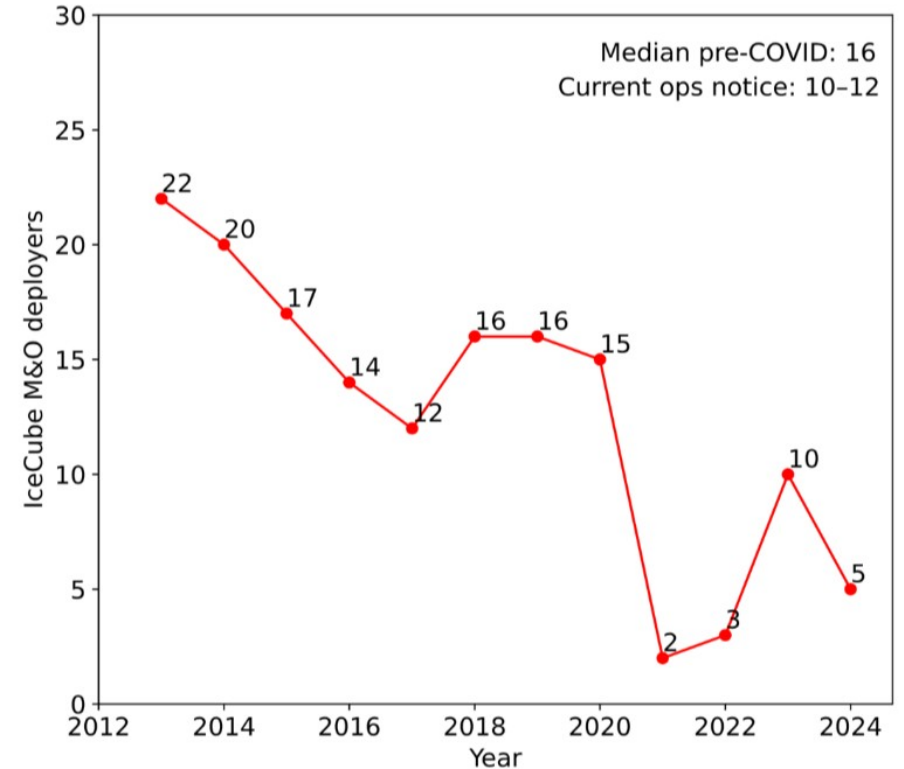
- No C-17s between mid-Dec to late-Jan
- More pressure on the C-130s

	November				December				January			
	wk-1	wk-2	wk-3	wk-4	wk-1	wk-2	wk-3	wk-4	wk-1	wk-2	wk-3	wk-4
Winter Over												
Winter Over												
SME												
SME												
SME												

With so few deployers, the majority need to be SMEs.  
 SMEs have other northern responsibilities and can't deploy > 5-6 weeks.

# Personnel

- Population limited since COVID
- Limited personnel rotations is challenging
  - Different experts needed at different times
  - Fewer collaborators getting the experience
  - Losing opportunity to train the next generation
  - Limits capability to support science (ARA, IceACT, Surface Array, etc.)



# Cargo

- Especially challenging this season

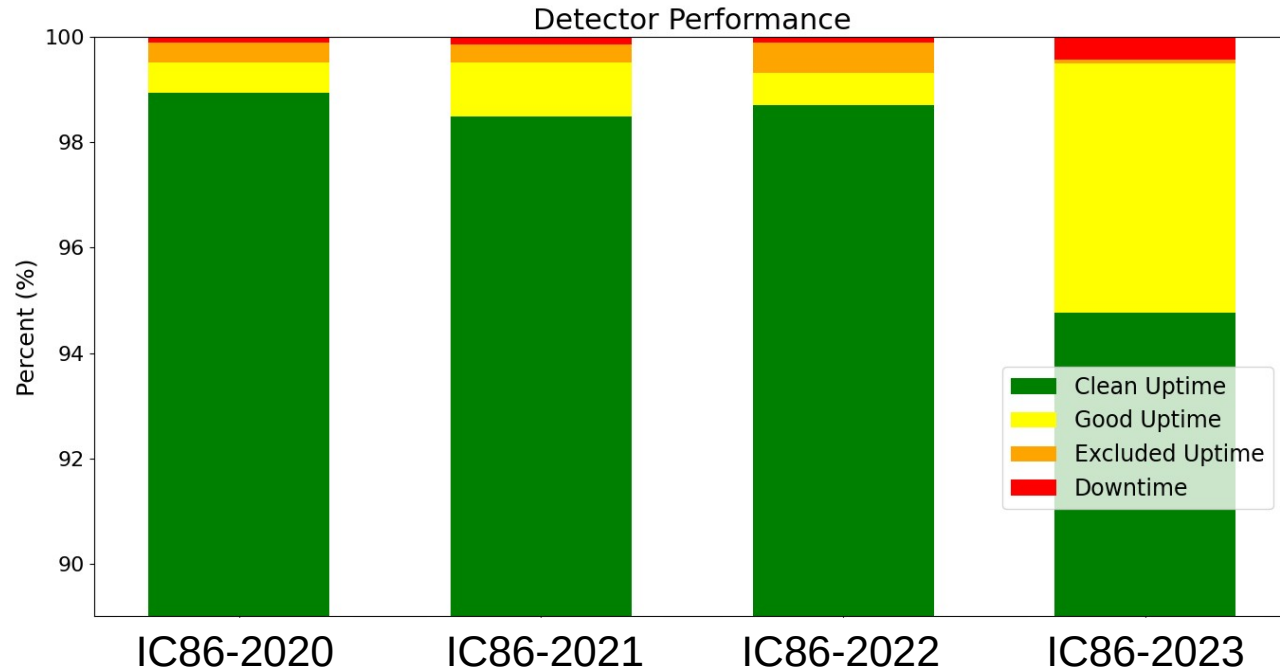


Description	ROS	Delivered	Delay (days)
Power supply 1	11/11/23	11/24/23	13
Power supply 2	11/11/23	12/20/23	39
Office lift	11/11/23	12/20/23	39
IceACT	11/25/23	12/07/23	12
Wind turbine	11/18/23	12/28/23	40
UPS 1	11/11/23	01/28/24	78
UPS 2	11/11/23	01/28/24	78
UPS 3	11/11/23	01/28/24	78
UPS 4	11/11/23	01/28/24	78
UPS 5	11/11/23	01/28/24	78
UPS 6	11/11/23	12/20/23	39
UPS 7	11/11/23	01/28/24	78

All UPSes hand-carried to the server room because the crane was broken and parts were delayed. Then no crane operator on-site.



# Impact of the UPS delay



The lack of experts leading the UPS replacements has caused:

- significantly degraded clean uptime
- additional hardware failures
- full detector down for an hour

	<u>January</u>	<u>February</u>
Clean Uptime:	99.20 %	89.89 %
Good Uptime:	0.64 %	9.65 %

# 2023-24 Field Season Activities

The Winterovers now tasked to complete these activities.

Maintenance activity	Status for 23-24	Primary constraints
ICL networking	Prioritized, complete	
Uninterruptible Power Supply replacement	Prioritized, incomplete	cargo delivery
DAQ and Upgrade support	Prioritized, complete	
ICL prototype wind turbine upgrade	complete	
Air Cherenkov telescope maintenance / upgrade	Scaled back, incomplete	population
ICL cable tower Upgrade support	Prioritized, complete	
Additional surface array station installations	deferred	population, cargo capacity, contractor support
Prototype solar panel installation	deferred	population, cargo capacity
Askaryan radio array maintenance	deferred	population

# 2024-25 Field Season Planning

## Core M&O

- Power infrastructure upgrade
- Firewall lifecycle replacement
- New workstations for B2 and ICL
- Data archival hard drives
- Dispose of old UPSes and batteries

## Upgrade Integration

- ICL Upgrade electronics installation and commissioning
- Support surface cable installation
- Support Upgrade DOM testing
- Two 50A receptacles for Rack-14

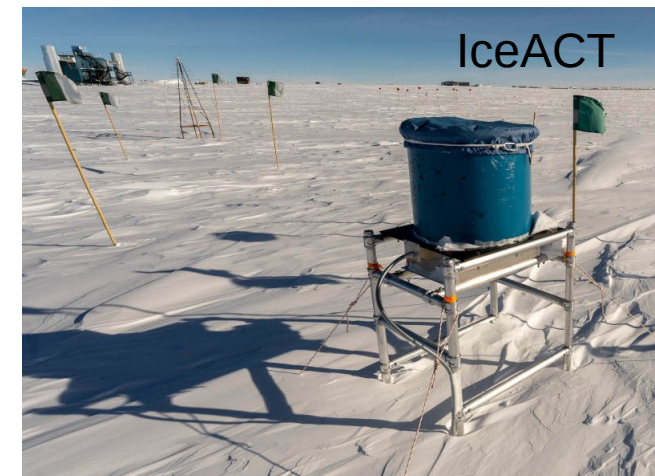
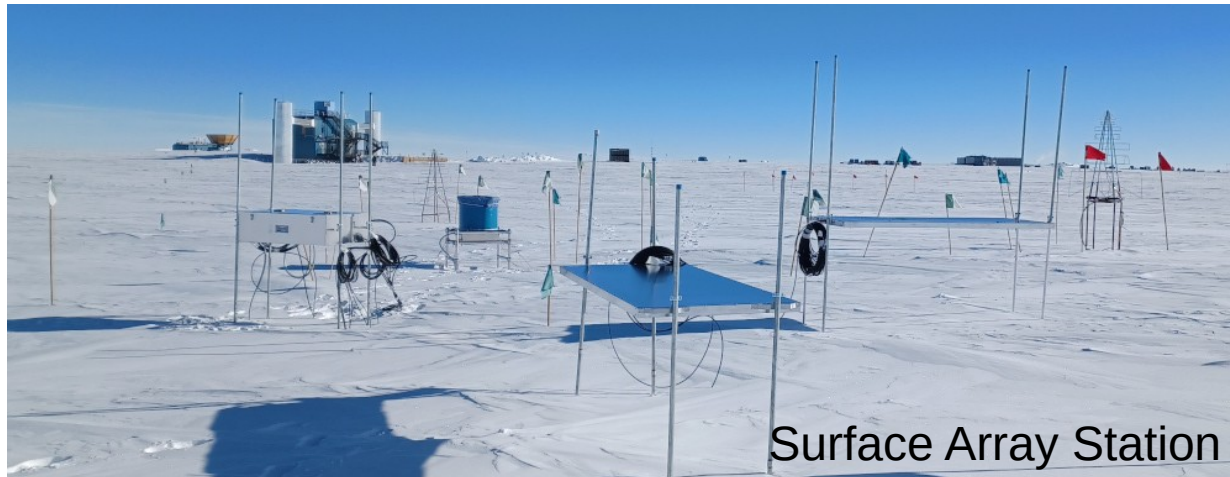
U47	White Rabbit grandmaster
U46	
U45	DOM power supply 1
U44	DOM power supply 2
U43	DOM power supply 3
U42	DOM power supply 4
U41	DOM power supply 5
U40	DOM power supply 6
U39	DOM power supply 7
U38	PDU 1 / switch 1 front/back
U37	PDU 2 / switch 2 front/back
U36	
U35	
U34	
U33	
U32	fieldhub87
U31	
U30	
U29	fieldhub88
U28	
U27	
U26	fieldhub89
U25	
U24	
U23	fieldhub90
U22	
U21	
U20	fieldhub91
U19	
U18	
U17	fieldhub92
U16	
U15	
U14	fieldhub93
U13	
U12	
U11	
U10	
U9	UPS, 7.2kW non-redundant
U8	
U7	
U6	
U5	
U4	
U3	UPS, 7.2kW non-redundant
U2	
U1	

Rack-14



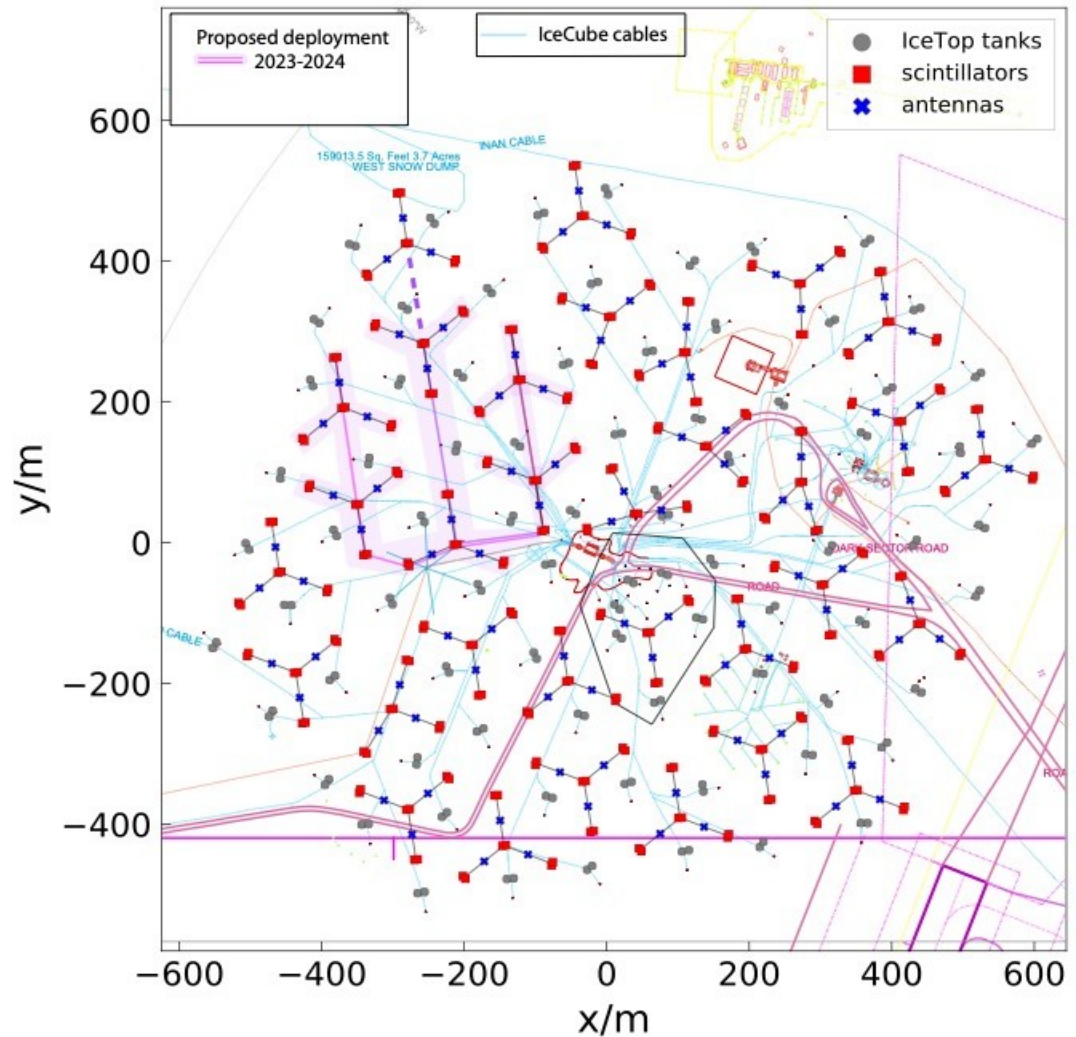
# Supporting New Science

- ARA DAQ maintenance (deferred from 2023-24)
- IceACT upgrade (deferred from 2023-24)
- SES solar installation (deferred from 2023-24)
- Surface array station antenna raise
- Deploy more surface array stations



# Surface Array (IceTop maintenance)

- Successful prototype station
- Construction previously limited by COVID, available logistics support, population limitations, etc.
- Detectors produced for 12 stations.
- 2023-24 deployments deferred. Propose resuming deployments for 2024-25.
- Goal: compact sub-array deployed before Upgrade drilling season.
  - can partially achieve most goals of the full surface array.



# Summary

- Keeping up with critical maintenance but not sustainable long-term
- Personnel rotations are key to achieve our maintenance tasks

