

Oliktok and AMF3 Update

- UAS flights Oct 2012
- UAS/Balloon Motivations Summary
- AMF3 Schedule Update
- Warning Area
- Current Issues and Projects at Oliktok Point

BAT-3 Flights with NMSU



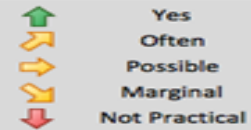
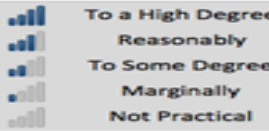
Quad-Copter Flights with NMSU



Tethered Balloons



UAS/Balloon Motivations

		Arctic Atmosphere - High Priority Climate Science Questions					
		Large System Variability	Clouds and Ice-Albedo Feedback	Atmospheric State	Surface State Coupling to Lower Troposphere	Seasonal/Spatial Variability	Model Process Evaluation
							
Aerial Measurement Platform's Ability to Satisfy Science Questions							
Small UAV's		↑	→	↘	↘	↑	→
Medium UAV's		→	→	↘	↘	→	→
Small Manned Aircraft		↘	↘	↘	→	↘	↑
Large Manned Aircraft		↓	→	→	→	↓	↑
		Arctic Offshore and Near-Shore Mission Suitability					
		Meets Safety and Regulatory Requirements	System Costs are Affordable	Good Mission Availability	Instruments are Mature	Operations and Maintenance Costs are Manageable	Satisfies Overall Science Questions
							
Aerial Measurement Platform							
Small UAV's		3 bars	3 bars	3 bars	3 bars	3 bars	3 bars
Medium UAV's		3 bars	3 bars	3 bars	3 bars	3 bars	3 bars
Small Manned Aircraft		3 bars	3 bars	3 bars	4 bars	3 bars	3 bars
Large Manned Aircraft		3 bars	2 bars	3 bars	4 bars	2 bars	3 bars

Task Name	Duration	Start	Finish	Resource Names	Task Name	Duration	Start	Finish	Resource Names
AMF-3 Integration and Install Phase 1 (Oliktok)	150 days?	Mon 2/4/13	Fri 8/30/13		5. (TSI) Total Sky Imager	85 days?	Mon 2/11/13	Fri 6/7/13	Cook
1. Micro Pulse Lidar Integration	90 days?	Mon 2/4/13	Fri 6/7/13	Cook	5.1 Determine mounting to Sky deck	5 days?	Mon 3/25/13	Fri 3/29/13	
1.1 Port and window	35 days?	Mon 2/4/13	Fri 3/22/13		5.1.1 Order Materials (Boxes, connectors, heaters, cable, ect...)	5 days?	Mon 4/1/13	Fri 4/5/13	
1.2 Window Heater	35 days?	Mon 2/4/13	Fri 3/22/13		5.2 Computer or virtual machine	5 days?	Mon 2/11/13	Fri 2/15/13	
1.3. MPL Stand or Rack	35 days	Mon 2/4/13	Fri 3/22/13		5.2.1 Determine serial to Ethernet / media converter	25 days?	Mon 2/11/13	Fri 3/15/13	
1.4 Computer or virtual machine	5 days?	Mon 2/11/13	Fri 2/15/13		5.3 Collecting data to Computer or virtual machine	35 days?	Mon 4/22/13	Fri 6/7/13	
1.5 Install hardware and MPL	5 days?	Mon 5/13/13	Fri 5/17/13		6. BBSS Balloon-Borne Sounding System (Digicora III)	35 days?	Mon 2/4/13	Fri 3/22/13	Yellowhorse
1.5 MPL taking Data	16 days?	Fri 5/17/13	Fri 6/7/13		6.1 Determine mounting antenna to shelter	10 days?	Mon 2/4/13	Fri 2/15/13	
2. Meteorology (MET Tower) Integration	90 days?	Mon 2/4/13	Fri 6/7/13	Zirzow / Yellowhorse	6.1.1 Order Materials (Boxes, connectors, heaters, cable, ect...)	4 days?	Mon 2/25/13	Thu 2/28/13	
2.1 Design Power System	21 days?	Mon 2/4/13	Mon 3/4/13		6.2 Collecting data to Computer or virtual machine	5 days?	Mon 2/11/13	Fri 2/15/13	
2.1.1 Order Materials (Boxes, connectors, heaters, power supplies, cable, ect...)	11 days?	Mon 3/4/13	Mon 3/18/13		6.2.1 Determine serial to Ethernet / media converter	5 days?	Mon 2/11/13	Fri 2/15/13	
2.2 Locate all instruments / Ship to Sandia	30 days?	Mon 2/4/13	Fri 3/15/13		6.3 Install Hardware / Instruments	5 days?	Mon 3/18/13	Fri 3/22/13	
2.3 Design logger box	20 days?	Mon 2/4/13	Fri 3/1/13		7. Data System and Networking / Communications	5 days?	Mon 5/13/13	Fri 5/17/13	Stuart / Cook
2.3.1 Order Materials (Boxes, connectors, heaters, power supplies, cable, ect...)	5 days?	Mon 3/4/13	Fri 3/8/13		7.1 Integrate data System at Atmospheric Research Instrumentation and Systems (ARIAS)	5 days?	Mon 5/13/13	Fri 5/17/13	
2.4 Erect tower	5 days?	Mon 3/4/13	Fri 3/8/13		8. Sky Deck	40 days?	Mon 2/18/13	Fri 4/12/13	Team
2.5 Install Hardware (Instruments, Loggers, Power)	20 days?	Mon 3/18/13	Fri 4/12/13		8.1 Determine Supplier	5 days?	Mon 2/18/13	Fri 2/22/13	
2.6 Computer or virtual machine	5 days?	Mon 2/11/13	Fri 2/15/13		8.2 Review drawings	5 days?	Mon 2/25/13	Fri 3/1/13	
2.7 Collecting Data to Loggers	35 days?	Mon 4/22/13	Fri 6/7/13		8.3 Place order	10 days?	Mon 3/4/13	Fri 3/15/13	
2.8 Collecting data to Computer or virtual machine	20 days?	Mon 5/13/13	Fri 6/7/13		8.4 Erect at Atmospheric Research Instrumentation and Systems	5 days?	Mon 4/8/13	Fri 4/12/13	
3. SKYRAD	90 days?	Mon 2/4/13	Fri 6/7/13	Zirzow / Yellowhorse	9. Generator Set and Shelter	85 days?	Mon 2/4/13	Fri 5/31/13	Team
3.1 Design Power System	20 days?	Mon 2/4/13	Fri 3/1/13		9.1 Determine Supplier	20 days?	Mon 2/4/13	Fri 3/1/13	
3.1.1 Order Materials (Boxes, connectors, heaters, power supplies, cable, ect...)	11 days?	Mon 3/4/13	Mon 3/18/13		9.2 Review drawings	5 days?	Mon 3/4/13	Fri 3/8/13	
3.1.2 Get SPG's Sky stand saw horse Drawings / Have built 2ea	50 days?	Mon 2/4/13	Fri 4/12/13		9.3 Place order	5 days?	Mon 3/11/13	Fri 3/15/13	
3.2 Locate all instruments / Ship to Sandia	31 days?	Mon 2/4/13	Mon 3/18/13		9.5 Integrate at Atmospheric Research Instrumentation and Syste	5 days?	Mon 5/27/13	Fri 5/31/13	
3.3 Design logger box	21 days?	Mon 2/4/13	Mon 3/4/13		10. AMF-3 shelter (1each)	44 days?	Tue 3/5/13	Fri 5/3/13	
3.3.1 Order Materials (Boxes, connectors, heaters, power supplies, cable, ect...)	11 days?	Mon 3/4/13	Mon 3/18/13		10.1 Inspection 25%	4 days?	Tue 3/5/13	Fri 3/8/13	
3.4 Install Hardware (Instruments, Loggers, Power)	20 days	Mon 3/18/13	Fri 4/12/13		10.2 Inspection 75%	4 days?	Tue 4/2/13	Fri 4/5/13	
3.5 Computer or virtual machine	5 days?	Mon 2/11/13	Fri 2/15/13		10.3 Inspection 100%	4 days?	Tue 4/23/13	Fri 4/26/13	
3.6 Collecting Data to Loggers	35 days?	Mon 4/22/13	Fri 6/7/13		10.4 Ship to Atmospheric Research Instrumentation and Systems	6 days?	Fri 4/26/13	Fri 5/3/13	
3.7 Collecting data to Computer or virtual machine	15 days?	Mon 5/20/13	Fri 6/7/13		11. Pack-up AMF-3 Phase 1	10 days?	Mon 6/10/13	Fri 6/21/13	Team
4. Ceilometer	85 days?	Mon 2/11/13	Fri 6/7/13	Cook	12. Ship AMF-3 Phase 1	35 days?	Mon 6/24/13	Fri 8/9/13	
4.1 Determine mounting to Sky deck	5 days?	Mon 4/1/13	Fri 4/5/13		13. Installation at Oliktok Phase 1	15 days?	Mon 8/12/13	Fri 8/30/13	Team
4.1.1 Order Materials (Boxes, connectors, heaters, cable, ect...)"	5 days?	Mon 4/15/13	Fri 4/19/13						
4.2 Collecting data to Computer or virtual machine	36 days?	Fri 4/19/13	Fri 6/7/13						
4.2.1 Determine serial to Ethernet / media converter	5 days	Mon 2/11/13	Fri 2/15/13						

Task Name	Duration	Start	Finish	Resource Names	Task Name	Duration	Start	Finish	Resource Names
AMF-3 Integration and Install Phase 2 (Oliktok)	235 days?	Mon 11/4/13	Fri 9/26/14		6. RADAR- Zenith Cloud Radar (KAZR)	170 days?	Mon 12/2/13	Fri 7/25/14	Cook / Yellowhorse
1. MWR3C	71 days?	Mon 2/3/14	Mon 5/12/14	Cook / Yellowhorse	6.1 Determine Determine power needs	5 days	Mon 12/2/13	Fri 12/6/13	
1.1 MWR3C Stand	35 days	Mon 2/3/14	Fri 3/21/14		6.2 Manage Connections to Data System	5 days	Mon 12/9/13	Fri 12/13/13	
1.2 Computer or virtual machine	5 days?	Mon 2/3/14	Fri 2/7/14		6.3 Collecting data to Computer or virtual machine	5 days	Mon 7/21/14	Fri 7/25/14	
1.3 Install hardware and MWR3C	5 days?	Mon 3/24/14	Fri 3/28/14		6.4 Ship Instrument Shelter/ hardware to Oliktok	15 days	Mon 6/16/14	Fri 7/4/14	
1.4 MWR3C taking Data	16 days?	Fri 4/4/14	Fri 4/25/14		6.5 Install Hardware / Instruments	10 days?	Mon 7/14/14	Fri 7/25/14	
1.5 Ship to Oliktok	9 days?	Wed 4/30/14	Mon 5/12/14		7. RADAR- (Mobile C-Band Precipitation Radar)	155 days?	Mon 12/2/13	Fri 7/4/14	Cook / Yellowhorse
2. ECOR	136 days?	Mon 11/4/13	Mon 5/12/14	Zirzow / Yellowhorse	7.1 Communications to AMF-3	5 days?	Mon 12/2/13	Fri 12/6/13	
2.1 Design Power System	5 days?	Mon 11/4/13	Fri 11/8/13		7.2 Find location for placement	115 days?	Mon 1/6/14	Fri 6/13/14	
2.1.1 Order Materials (Boxes, connectors, heaters, power supplies, cable, ect...)	5 days	Mon 11/11/13	Fri 11/15/13		7.3 Ship Instrument Shelter/ hardware to Oliktok	15 days	Mon 6/16/14	Fri 7/4/14	
2.2 Locate all instruments / Ship to Sandia	30 days?	Mon 11/4/13	Fri 12/13/13		8. Aersol Instruments	155 days?	Mon 12/2/13	Fri 7/4/14	Team
2.3 Design logger box	5 days?	Mon 11/4/13	Fri 11/8/13		8.1 Communications to AMF-3	5 days?	Mon 12/2/13	Fri 12/6/13	
2.3.1 Order Materials (Boxes, connectors, heaters, power supplies, cable, ect...)	5 days?	Mon 11/11/13	Fri 11/15/13		8.2 Determine Power Needs	5 days	Mon 12/2/13	Fri 12/6/13	
2.4 Erect tower	5 days?	Mon 1/6/14	Fri 1/10/14		8.3 Find location for placement	5 days	Mon 5/5/14	Fri 5/9/14	
2.5 Install Hardware (Instruments, Loggers, Power)	20 days?	Mon 1/13/14	Fri 2/7/14		8.4 Ship Instrument Shelter/ hardware to Oliktok	15 days	Mon 6/16/14	Fri 7/4/14	
2.6 Computer or virtual machine	5 days?	Mon 11/4/13	Fri 11/8/13		9. AERI	170 days?	Mon 12/2/13	Fri 7/25/14	Cook / Yellowhorse
2.7 Collecting Data to Loggers	35 days?	Mon 1/13/14	Fri 2/28/14		9.1 Determine Power Needs	5 days	Mon 12/2/13	Tue 12/10/13	
2.8 Collecting data to Computer or virtual machine	15 days?	Mon 3/3/14	Fri 3/21/14		9.1.1 Select Instrument Shelter / cut holes	1 day?	Mon 2/3/14	Mon 2/3/14	
2.9 Ship to Oliktok	9 days?	Wed 4/30/14	Mon 5/12/14		9.2 Install Instrument	5 days	Tue 2/4/14	Mon 2/10/14	
3. 915 Wind Profiler	85 days?	Mon 4/28/14	Fri 8/22/14	Zirzow / Yellowhorse	9.2 Manage Connections to Data System	1 day	Tue 2/11/14	Tue 2/11/14	
3.1 Install Hardware (Instruments, Loggers, Power)	10 days	Mon 5/5/14	Fri 5/16/14		9.3 Collecting data to Computer or virtual machine	118 days?	Wed 2/12/14	Fri 7/25/14	
3.2 Computer or virtual machine	5 days?	Mon 4/28/14	Fri 5/2/14		9.4 Ship hardware to Oliktok	15 days?	Mon 6/16/14	Fri 7/4/14	
3.3 Collecting data to Computer or virtual machine	25 days?	Mon 5/19/14	Fri 6/20/14		10. Doppler Lidar	170 days?	Mon 12/2/13	Fri 7/25/14	Cook / Yellowhorse
3.4 Ship to Oliktok	15 days?	Mon 8/4/14	Fri 8/22/14		10.1 Determine Power Needs	5 days	Mon 12/2/13	Tue 12/10/13	
4. 2DVD (or Arctic Equivalent)	60 days?	Mon 6/2/14	Fri 8/22/14	Cook / Yellowhorse	10.1.1 Select Instrument Shelter / cut holes	1 day?	Mon 3/3/14	Mon 3/3/14	
4.1 Determine mounting to Sky deck	5 days?	Mon 6/2/14	Fri 6/6/14		10.2 Install Instrument	5 days	Tue 3/4/14	Mon 3/10/14	
4.1.1 Order Materials (Boxes, connectors, heaters, cable, ect...)"	5 days?	Mon 6/9/14	Fri 6/13/14		10.2 Manage Connections to Data System	1 day	Tue 3/11/14	Tue 3/11/14	
4.2 Instrument setup	5 days	Mon 6/23/14	Fri 6/27/14		10.3 Collecting data to Computer or virtual machine	98 days?	Wed 3/12/14	Fri 7/25/14	
4.2 Collecting data to Computer or virtual machine	20 days?	Mon 6/30/14	Fri 7/25/14		10.4 Ship hardware to Oliktok	15 days?	Mon 6/16/14	Fri 7/4/14	
4.3 Ship to Oliktok	15 days	Mon 8/4/14	Fri 8/22/14		11. Pack-up AMF-3 Phase 2	10 days?	Mon 6/2/14	Fri 6/13/14	Team
5. RADAR- (Scanning Cloud RADAR)	170 days?	Mon 12/2/13	Fri 7/25/14	Cook / Yellowhorse	12. Ship AMF-3 Phase 2	15 days	Mon 6/16/14	Fri 7/4/14	
5.1 Determine Power Needs	5 days	Mon 12/2/13	Tue 12/10/13		13. Installation at Oliktok Phase 2	15 days	Mon 7/7/14	Fri 7/25/14	Team
5.2 Manage Connections to Data System	5 days?	Wed 12/11/13	Tue 12/17/13						
5.3 Collecting data to Computer or virtual machine	5 days?	Mon 7/21/14	Fri 7/25/14						
5.4 Ship Instrument Shelter/ hardware to Oliktok	25 days?	Mon 6/16/14	Fri 7/18/14						
5.5 Collecting data to Computer or virtual machine	10 days?	Mon 7/14/14	Fri 7/25/14						

Oliktok Point Arctic Research Facility (OPARF)



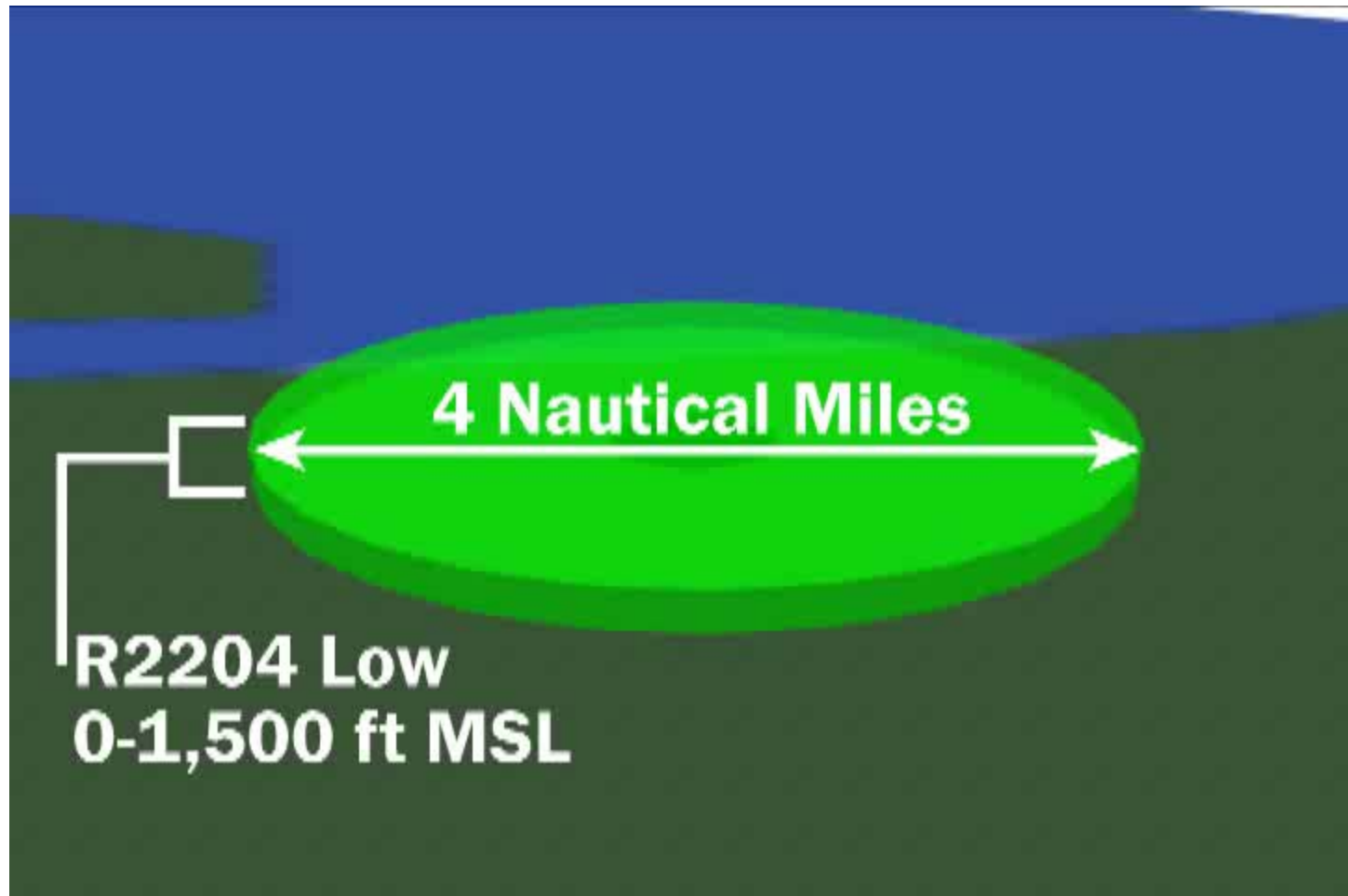
Oliktok Point Arctic Research Facility (OPARF) is on the coast of the Arctic Ocean at about 150 west longitude.

We have established a designated DOE User Facility at Oliktok Point.

Oliktok Point

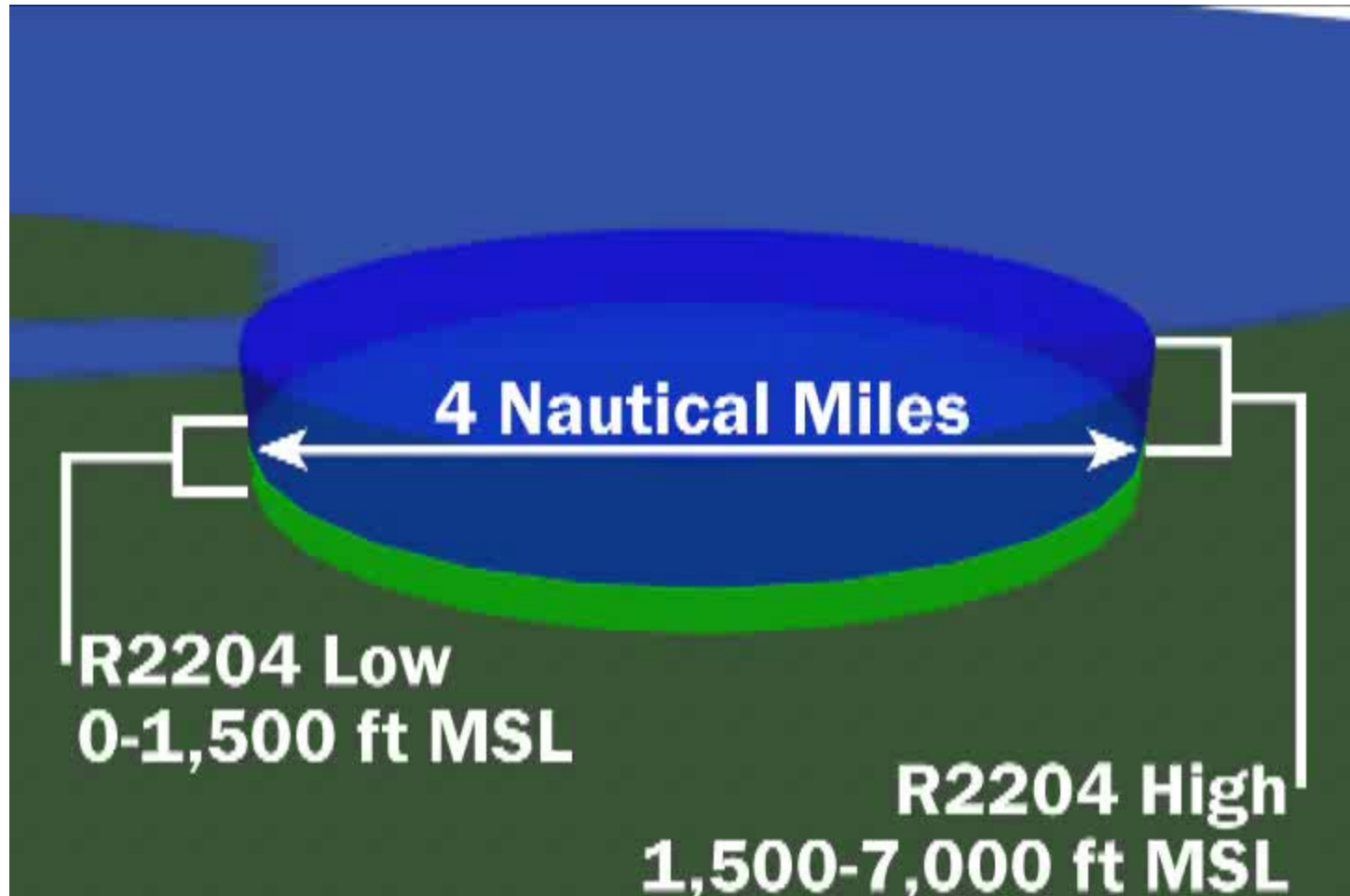


Restricted Airspace R2204 Airspace at Oliktok Point.



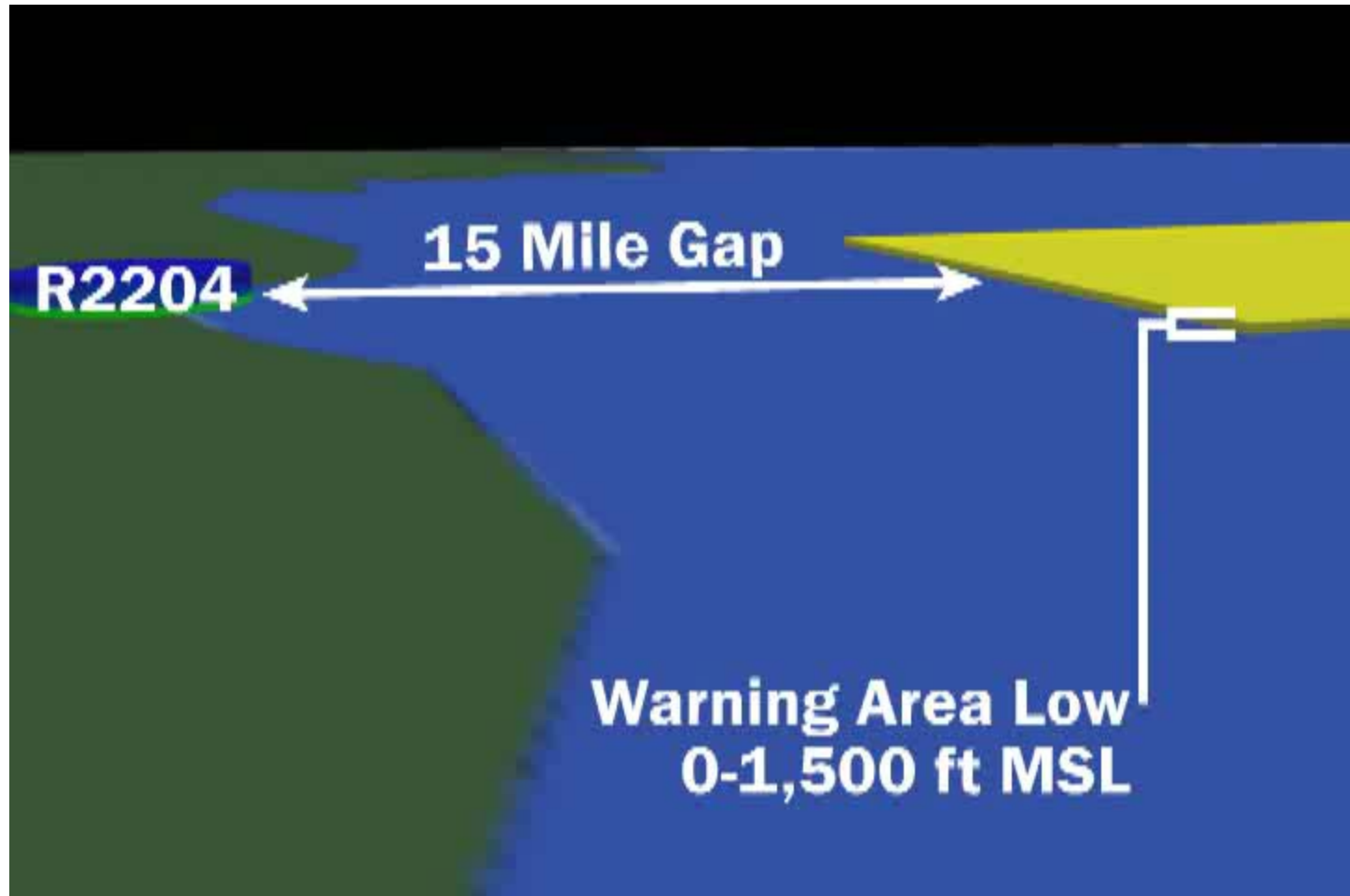
Restricted Airspace R2204 at Oliktok Pt; originally obtained by Sandia for a field experiment at Oliktok in 2004 (Mixed-Phase Arctic Cloud Experiment [M-PACE]); It's airspace that, when activated (at DOE discretion), DOE controls; Restricted Airspace is the mechanism through which FAA keeps non-participating aircraft out of an area.

A Step Towards an Arctic Climate Observatory: Warning Area over International Waters.

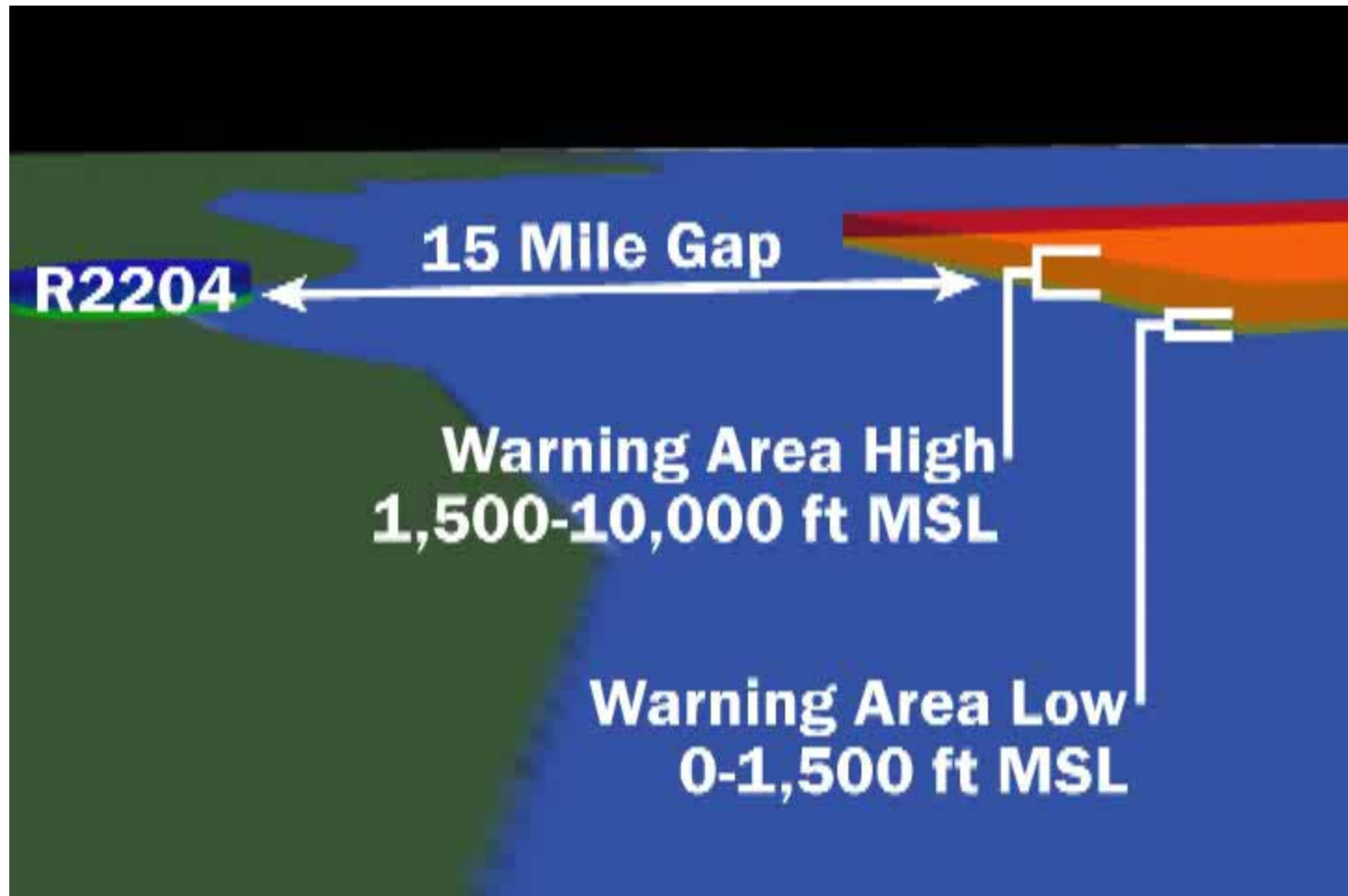


DOE has requested from the FAA the creation of a Warning Area over International Waters adjoining Oliktok to accommodate unmanned aircraft flights and other aviation related research activities out over the Arctic Ocean focused on the rapid retreat of the sea ice; Warning Areas confer similar operational advantages as Restricted Airspace, but over international waters. The gap exists because it is FAA policy to only create warning areas over international waters. The gap can be spanned with an FAA granted certificate of authorization on an experiment by experiment basis.

A Step Towards an Arctic Climate Observatory: Warning Area over International Waters.



The Proposed Warning Area covers about 2/3 of the distance between Oliktok Point and the North Pole.

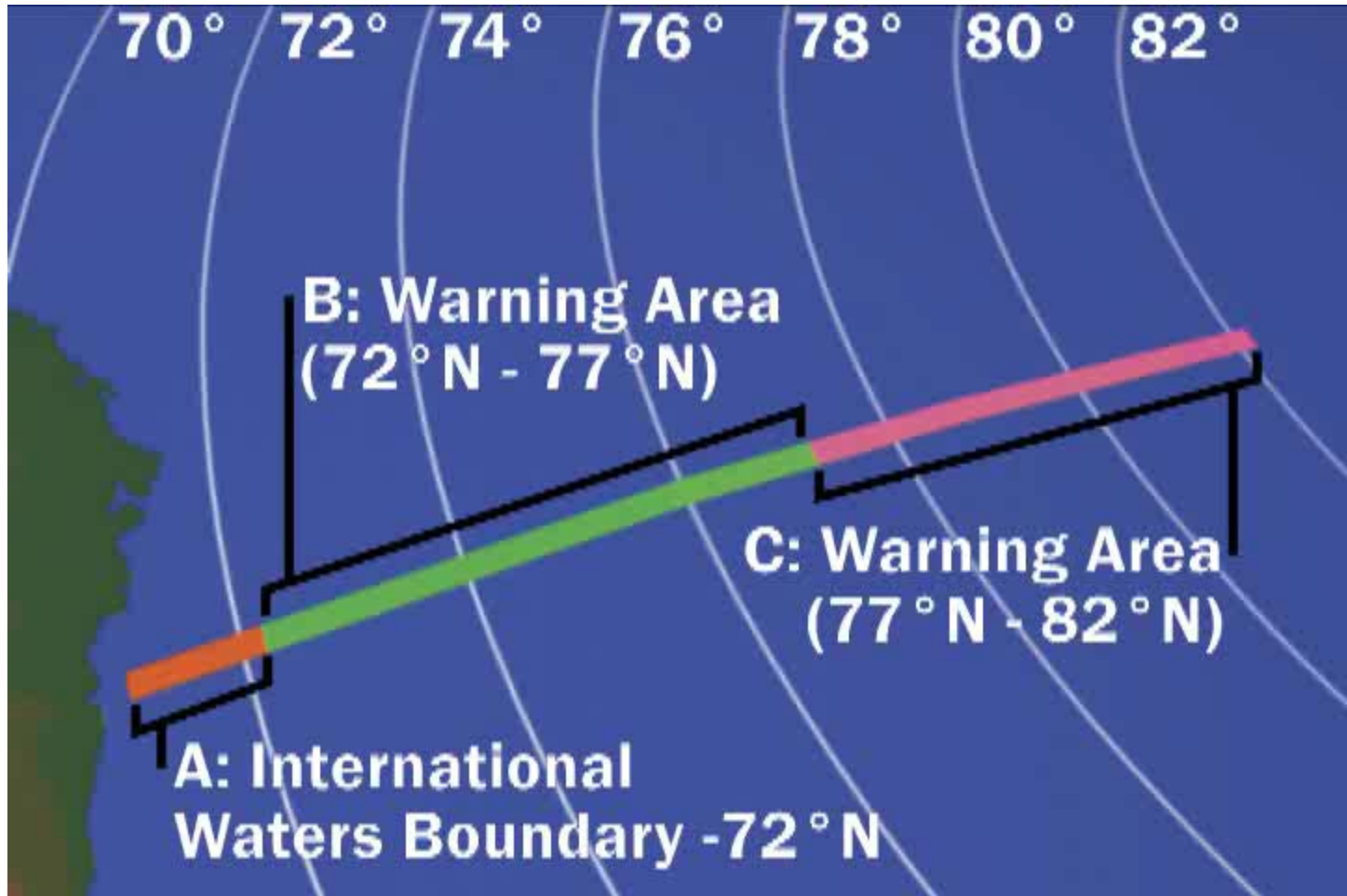


A: Boundary of International Waters to 72° N latitude

B: 72° N latitude to 77° N latitude

C: 77° N latitude to 82° N latitude

The Proposed Warning Area covers about 2/3 of the distance between Oliktok Point and the North Pole.





Oliktok LRRS

