

ANTARCTIC AUTOMATIC WEATHER STATION PROGRAM: FUTURE PLANS AND DISCUSSION

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1. ABSTRACT

The future of the United States Antarctic Program (USAP) Automatic Weather Station (AWS) network has important implications toward the research goals of the network as well as impacts operational and third party users of the observations from the network. This presentation outlines the general plans for the 2009-2010 field season and lays out our proposal for the short to mid-term future of the network. An open forum will follow this presentation to discuss these plans as well as answer questions, and review comments and suggestions for future AWS operations.

2. AWS 2009-2010 FIELD SEASON PLANS

Plans for the 2009-2010 field season fall under two categories: activities by (1)the University of Wisconsin field team and (2) its collaborators. Table 1 outlines the draft plan for the 2009-2010 season by the Wisconsin field team. Efforts are sub-divided into 4 areas: (1) installation of a Tall Tower AWS 100 miles south of McMurdo Station, (2)servicing of AWS sites within helicopter range of McMurdo Station, (3)servicing of AWS sites from fixed wing platform based out of McMurdo Station, (4)servicing of AWS sites in West Antarctica, and one AWS test installation at South Pole.

Collaborations on a national and international basis will permit a multi-regional effort this upcoming season with AWS servicing expected to take place in several areas, as outlined in Table 2. In addition, a recent request for three new AWS installations in support of research and operations in West Antarctica are also scheduled. This will yield some of the first weather observations in this part of Antarctica on a year round basis. These installations would not be possible without collaborative transportation resources

3. FUTURE FIELD SEASONS

Projecting into the future, the AWS network will need to reflect current economic realities, funding limitations, and changes in policy. Overall, the AWS network should meet its primary role to support current and pending proposed NSF funded Antarctic research activities. Table 3 outlines a proposed draft plan. With the shift of Argos communication costs to grantees (and hence incurring additional overhead costs) combined with the current economic situation, funding priorities will be impacted for the AWS network. The number of AWS units deployed will be reduced a small percentage. A number of AWS sites will stay in operation, however, they will formally have new caretakers (and no longer be a part of the Wisconsin network) or will have data collected via a less expensive means (such as via UHF radio modems).

The Wisconsin AWS program continues to actively seek collaborative opportunities that can be accommodated within the framework of the USAP that enhance the AWS program while benefiting the broader community. The primary objective remains to optimize the research capabilities of the largest surface meteorological observing network in Antarctica and effectively augment the other international AWS networks on the continent for the benefit of research and operations. We encourage and look forward to engaging in an active dialog with all interested parties on this important topic.

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Table 1. AWS Activities planned this season (2009-2010) by U. Wisconsin field team¹

AWS Site	Latitude	Longitude	Elevation	Status	Field Season Activity	Comments
Tall Tower	78.82° S	173.33°E	Unknown	Not installed – new AWS site	First installation	Site to be renamed, Put-in by traverse and twin otter
Elaine	83.097°S	174.29°E	62 m	Installed Off air	Servicing	Twin Otter
Carolyn	79.939°S	175.884°E	52 m	Installed Off air	Servicing	Twin Otter
Lettau	82.481°S	174.57°E	39 m	Installed	Servicing	Twin Otter
Gill	79.922°S	178.586°W	54 m	Installed	Servicing	Twin Otter
Byrd	80.007°S	119.404°W	1530 m	Installed	Servicing	Twin Otter or LC130 to camp
Siple Dome	81.656°S	148.773°W	668 m	Installed	Servicing	Twin Otter or LC130 to camp
Kominko-Slade (WAIS Divide)	79.466°S	112.106°W	1801 m	Installed	Servicing	Twin Otter or LC130 to camp
Elizabeth	82.607°S	137.078°W	519 m	Installed	Servicing	Twin Otter
Harry	83.003°S	121.393°W	945 m	Installed	Servicing	Twin Otter
Erin	84.904°S	128.828°W	990 m	Installed	Servicing	Twin Otter
South Pole	-90°S		Unknown	Not installed	Install of test AWS (non-transmitting)	LC130 day trip. One year test - only
Cape Bird	77.21°S	166.439°E	38 m	Installed	Servicing	Helicopter
Ferrell	77.846°S	170.819°E	45 m	Installed	Servicing	Helicopter
Laurie II	77.517°S	170.801°E	37 m	Installed	Servicing	Helicopter
Linda	78.426°S	168.418°E	43 m	Installed	Servicing	Helicopter
Marble Point	77.439°S	163.754°E	108 m	Installed	Servicing	Helicopter
Minna Bluff	78.554°S	166.69°E	895 m	Installed	Servicing	Helicopter

¹ This list is subject to modification based on any AWS failures that may occur before the start of the field season. Some sites may not be visited due to limited logistics or weather. This list is not in priority order.

Table 2. AWS Activities planned this season (2009-2010) by U. Wisconsin collaborators ²

AWS Site	Latitude	Longitude	Elevation	Status	Collaborator	Comments
Pegasus North	77.952oS	166.5oE	10 m	Installed – needs servicing	John Cassano	USAP - O-400-M
PIG Helo Camp (Site C)	75.6°S	99.917°W	Unknown	Not installed – new AWS site	David Holland field team (includes UNAVCO)	USAP - WAP
Thurston Island	72.53°S	97.56°W	Unknown	Not installed – new AWS site	David Holland field team (includes UNAVCO)	USAP - WAP - POLENET
Bear Peninsula	74.546°S	111.88°W	Unknown	Not installed – new AWS site	David Holland field team (includes UNAVCO)	USAP - WAP - POLENET
E-66	68.912°S	134.655°E	2485 m	Installed – needs repair	Christophe Genthon	France - IPEV
Port Martin	66.82°S	141.39°E	39 m	Installed – needs repair	Christophe Genthon	France - IPEV
Dome Fuji	77.31oS	39.7°E	3810 m	Installed – needs repair	Takao Kameda	Japan - JARE
Relay Station	74.017°S	43.062°E	3353 m	Installed – needs repair	Takao Kameda	Japan - JARE
Cape Denison	67.009°S	142.664°E	31 m	Installed – needs servicing	Rob Easther	Mawson's Huts Foundation
Panda South	82.325°S	75.989°E	4027 m	Installed – needs repair	Bian Ligen, Cunde Xiao	China - CHINARE

²This list is not in priority order and is subject modification.

Table 3. AWS Activities proposed in future years (pending funding and is subject change).

AWS Site	Latitude	Longitude	Elevation	Plan	Comments
I-157 Fuel cache	78.0°S	96.03°W	Unknown	New AWS install	Proposal pending with NSF. Install proposed 2010-2011
I-189 Fuel Cache	77.17°S	123.4°W	Unknown	New AWS install	Proposal pending with NSF. Install proposed 2010-2011
Swithinbank	81.201°S	126.177°W	959 m	AWS removal	Proposal pending with NSF. Removal proposed 2010-2011 or 2011-2012
Brianna	83.889°S	134.154°W	525m	AWS removal	Proposal pending with NSF. Removal proposed 2010-2011 or 2011-2012
Theresa or Harry	Theresa: 84.599°S	Theresa: 115.811°W	Theresa: 1463 m	AWS removal	Proposal pending with NSF. Removal proposed 2010-2011 or 2011-2012 – exact site to be removed to be determined.
	Harry: 83.003°S	Harry: 121.393°W	Harry: 945 m		
Larsen Ice Shelf, Bulter Island, Sky Blu, Limbert, Baldrick	Various	Various	Various	AWS communications hand over to British Antarctic Survey	United Kingdom takes over AWS completely in 2010-2011 or 2011-2012 field seasons.
Minna Bluff, Linda, Lorne, Ferrell, Laurie II, Windless Bight, Willie Field, Pegasus North	Various	Various	Various	AWS communications switch from Argos DCS to UHF/VHF modem	Proposal pending with NSF. Switch to take place over 2 field seasons 2010-2011 and 2011-2012. Exact sites pending communications tests.
Mt. Friis, Mt. Fleming	77.533°S	160.271°E	1950 m	Removal of Argos DCS communications	AWS returned to original PIs or removed.
	77.747°S	161.516°E	1580 m		
Megadunes AWS (Little Mac, Zoe, etc.)	~80.7°S	~124.45°E	~2884 m	Removal of older AWS, and leave one working AWS	Proposal Pending with NSF for 2010-2011 field season

AWS Site	Latitude	Longitude	Elevation	Plan	Comments
Mt. Siple, Possession Island, Kirkwood Island	Various	Various	Various	AWS sites with no logistics plans to visit for repair	As sites fail, they will not be replaced or repaired
Dismal Island	68.087°S	68.825°W	10 m	AWS may be adopted by BAS	Future unknown, under discussion
Ross Ice Shelf site 1, Ross Ice Shelf site 2	Near Sabrina AWS - TBD	Near Sabrina AWS - TBD	Near Sabrina AWS - TBD	New AWS install – temporary for 2 years	Proposal pending with NSF. Installation in 2010-2011 and removal in 2012-2013
Henry	89.011°S	1.025°W	2755 m	AWS Removal	Proposal pending with NSF. Removal proposed 2010-2011 or 2011-2012. Recommend AWS site to be taken over by McMurdo Weather
Nico	89.00°S	89669°E	2935 m	AWS Removal	Proposal pending with NSF. Removal proposed 2010-2011 or 2011-2012. Recommend AWS site to be taken over by McMurdo Weather
Whitlock	76.144°S	168.392°E	206 m	AWS repair	Proposal pending with NSF. Repair pending availability of over-water helicopters.
Peter I Island	68.769°S	90.67°W	90 m	AWS replacement	AWS installed, but not working. Proposal pending with NSF. AWS replacement proposed 2010-2011, and depends on availability of helicopters on the Oden.