LOW LEVEL REMOTE SENSING TO DIRECTLY DETECT ANTARCTIC SURFICIAL BLUE ICE METEORITES; A. A. Mardon, Texas A&M University, College Station, Texas, 77844.

The proposition behind my presentation is that it is theoretically possible to detect surface meteorites in the Antarctic through remote sensing technology. Remote sensing has been used to discern potential areas that have meteorites, but has not been used to detect Meteorites directly.[1] The systems that have been used have been primarily centered around the LANDSAT satellite sensing system and some ancillary C-130 mounted sensing systems.[2] It has been found that the meteorites predominately occur in areas that have blue ice. This has meant that it is possible to categorize potential areas of Meteorite location in terms of their blue ice remote sensing signature. The stages of present remote sensing use in Antarctic Meteorite Recovery are first, searching the National Archives in Washington which contains the most extensive Antarctic aerial photograph and satellite image collection in the United States of America. After it has deduced been that the area being considered has the appropriate signature from the aircraft based photographes, the area is then viewed through LANDSAT images if these are available.

From very early on in the author's participation in the antarctic search for meteorites the question was whether to focus on satellite systems or airborne sensing systems. It was the Dr Cassidy's and the author's opinion that resolution capabilities of online systems were not appropriate for the location of meteorites. The proposal took on several shapes depending on the logistical parameters of the field season that the author was to be a member of. One of the original proposals was to have the resupply missions flown by the Navy to include a secondary photography mission over areas that were going to be traversed by the field team later in the field season. This was either to be done on a C-130 platform or a helicopter platform.[3]

A 70mm camera mount was found appropriate for use on the helicopters used in the Antarctic if the field season was to be scheduled in the Allan Hills.[4] One of the other proposals recommended by Dr. Roscoe early on in the project was that Remotely Piloted Air Vehicles(RPV's) might have some application for meteorite reconnaissance. After some investigation the USAF Aquila RPV or the Canadair Sentinel RPV were selected as potentially applicable . The major problem with such applications is that the helicopter and RPV have limited ranges in the Antarctic. While their usage entails more inexexpensive reconnaissance missions as compared to C-130 platforms they are only useful within the Helicopter umbrella of McMurdo Station/Scott Station. In addition an RPV system would have to be operated within line of sight of the primary operator. Previous tests of RPV's off the Antarctic coastline during the 1950's were not successful because of operation out of sight from the operator.[5] It is the authors conjecture that RPV as a technology should be applied to this and other Antarctic projects when it is logistically feasible. The only present meteorite standing surfaces that might have helicopter based sensing flights flown are those comprising the Allan Hills Complex. The other sites that have been located are well outside the range of helicopter systems based from McMurdo/Scott Station.

Several hundred exposures were taken on the ground and from the airusing hand held video and 35mm camera systems. The major conclusion at this time is that it is possible to distinguish lighter colored rocks from darker colored rocks. The question is whether this can be turned into a feasible method of detecting meteorites. In conjunction with the detection of meteorite standing surfaces direct meteorite detection is presently possible from low levels.

References:

1.Personal Communication Dr. John Hobart Roscoe.

2.Thomas, R. H. and others. Satellite Remote Sensing for Ice Sheet Research. NASA Technical Memorandum 86233, 1985.

3.*Photography for Meteorite Recovery.* Meteor News. #78, July, 1987, page 3.

4.de la Harpe, Roger. *Low-Cost Areial Photography.* Natal Parks Board.

5.Personal Communication Dr.John Hobart Roscoe.

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