

RECORD OF ENVIRONMENTAL CONSIDERATION

PROJECT NAME: Operation Ice Bridge

1. Date and/or Duration of project: March 2010 - 2015

2. It has been determined that the above action (choose one)

a. Is adequately covered in an existing EA or EIS.

Title: _____

Date: _____

b. Qualifies for Categorical Exclusion and has no special circumstances which would suggest a need for an Environmental Assessment.

Categorical Exclusion: 14 CFR 1216.305 (d)(2) – Research and Development activities in space and terrestrial applications

c. Is exempt from NEPA requirements under the provisions of:

d. Has no significant environmental impacts as indicated by the results of an environmental checklist and/or detailed environmental analysis. (Attach checklist or analysis as applicable)

e. Will require the preparation of an Environmental Assessment.

f. Will require the preparation of an Environmental Impact Statement.

3. Description and location of proposed action:

Operation Ice Bridge is a data gap filler project between ICESat-1 (Ice, Cloud and Land Elevation Satellite 1) and ICESat-2 (Ice, Cloud and Land Elevation Satellite 2) that will not be launched until the 2015 time frame. The goals of Operation Ice Bridge are to study and monitor the changing areas of the Cryosphere including the Earth's ice sheets, sea ice and glaciers. Operation Ice Bridge will use airborne platforms to maintain altimetry time series and monitor important areas of land ice and sea ice until the launch of NASA's next satellite-lidar mission. Operation Ice Bridge will monitor the sea ice extent, snow cover on sea ice, ice sheet elevation, ice sheet near surface firn (snow which has persisted through one melt season), ice sheet mass balance and the bed topography of the ice sheet. The Ice Bridge science objective will be met by conducting two airborne campaigns per year, one over the Greenland ice sheet and surrounding areas and the second over the Antarctic Ice Sheet and surrounding areas.

Antarctica Campaign

The Antarctic DC-8 Ice Bridge Campaign will occur from approximately October 15 to November 30, 2010 with additional flights through 2015. The NASA DC-8 aircraft will be loaded with a complete instrument package to reach the science objectives for flights over the Greenland Ice Sheet and outlet glaciers. The instrument package will include laser altimeters, (the Airborne Topographic Mapper (ATM) and the Laser Vegetation Imaging System (LVIS) altimetry instruments), a suite of near surface and depth sounding radars (the University of Kansas' Center for Remote Sensing of Ice Sheets (CReSIS) radar suite that includes the snow radar, accumulation radar, Ku altimeter and the Multichannel Radar Depth Sounder (MCORDS) radar), a visible imaging system (the Digital Mapping System (DMS)) and a gravimeter (the AIRGrav system supplied by Lamont Doherty Earth Observatory (LDEO) of Columbia University). The NASA DC-8 aircraft will be based out of Punta Arenas, Chile.

Greenland Campaign

The Greenland 2010 Operation Ice Bridge campaign will consist of two phases. Phase 1 will occur from approximately March 22 to April 23, 2010. During phase 1 the NASA DC-8 aircraft will be loaded with a complete instrument package to reach the science objectives for flights over sea ice and the northern Greenland Ice Sheet. The instrument package will include 2 altimeters, (the Laser Vegetation Imaging Sensor (LVIS) and Airborne Topographic Mapper (ATM) altimetry instruments), a suite of near surface and depth sounding radars (the University of Kansas' Center for Remote Sensing of Ice Sheets (CReSIS) radar suite that includes the snow radar, accumulation radar, Ku altimeter and the Multichannel Radar Depth Sounder (MCORDS) radar), a visible imaging system (the digital mapping system (DMS)) and a gravimeter (the AIRGrav system supplied by Lamont Doherty Earth Observatory (LDEO)). During phase 1 the NASA DC-8 aircraft will be based out of Thule, Greenland, Fairbanks, Alaska and Keflavik, Iceland.

Phase 2 of the Operation Ice Bridge Greenland 2010 campaign will occur from approximately May 3 to May 28, 2010. During phase 2 the NASA P-3 aircraft will be loaded with a complete instrument package to reach the science objectives for flights over the Greenland Ice Sheet and outlet glaciers. The instrument package will include an altimeter, (the Airborne Topographic Mapper (ATM) altimetry instrument), a suite of near surface and depth sounding radars (the University of Kansas' Center for Remote Sensing of Ice Sheets (CReSIS) radar suite that includes the snow radar, accumulation radar, Ku altimeter and the Multichannel Radar Depth Sounder (MCORDS) radar), a visible imaging system (the Digital Mapping System (DMS)) and a gravimeter (the AIRGrav system supplied by Lamont Doherty Earth Observatory (LDEO) of Columbia University). During phase 2 the NASA P-3 aircraft will be based out of Kangerlussuaq and Thule, Greenland.


The campaigns will continue through 2015 timeframe until the launch of ICESat-2. Different aircraft platforms, such as the Global Hawk, and different instrument packages may be used for some of these campaigns.

The campaigns will implement measures to mitigate impacts from aircraft/laser operations, such as change and timing of flight paths, increase in flight altitudes over certain sensitive areas, laser operation restrictions, and FAA letter of non-objection or foreign equivalent, as needed.

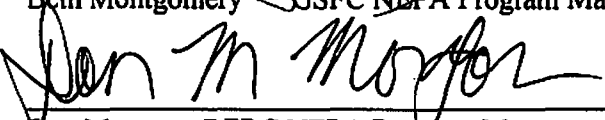
Numerous environmental evaluations have been performed for the airborne science activities. These are hereby incorporated by reference into this document. They include:

- (1) WFF Record of Environmental Consideration (REC) for the Laser Vegetation Imaging Sensor (LVIS) 2009 Greenland Ice Cloud and Land Elevation Satellite (ICESat) Gap Filler Field Campaign, March 20, 2009
- (2) ARC Environmental Document and Finding of No Significant Impact and Not More than Minor or Transitory Environmental Impact, October 5, 2009
- (3) DFRC Record of Environmental Consideration DC-8 Operation Ice Bridge, Chile to Antarctica, September 8, 2009
- (4) WFF Record of Environmental Consideration Arctic Campaign, April 19, 2007

Operation Ice Bridge has been evaluated in accordance with NASA's NEPA regulations and procedural requirements. Based on this review it is concluded that environmental impacts of Operation Ice Bridge would be minor and transient and would not be significant. As such the project qualifies as a Categorical Exclusion in accordance with 14 CFR 1216.305 (d)(2) – Research and Development activities in space and terrestrial applications. For the purposes of review under EO 12114, Environmental Effects Abroad of Major Federal Actions, Operation Ice Bridge is considered an action not having a significant effect on the environment outside the United States.


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4/20/2010
Date


Dan Morgan DFRC NEPA Program Manager, Code SH

4-20-10
Date


Kent Shiffer ARC Earth Science Project Office

4/20/10
Date