

# RECORD OF ENVIRONMENTAL CONSIDERATION

**PROJECT NAME:** Arctic Campaign

1. Description and location of proposed action:

The Arctic Campaign is an ongoing mission that will be likely repeated over the next five years. Each mission will be performed for various objectives to study polar icecap regions. The mission purposes are to conduct high and low altitude remote sensing in specified locations over the Greenland and Svalbard Ice-Sheet. The missions measure both surface and subsurface topography of the ice-sheets. The Greenland flights will study the ice sheet mass topographic balance using the WFF ATM4 laser altimeter as the primary instrument and various side-aperture-radars to compare data from prior Greenland surveys to determine ice sheet gain or loss.

Date and/or Duration of project: April 2007 – April 2012

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: 4.2.1 a (2)

(NASA, NPR 8580.1, Chapter 4)

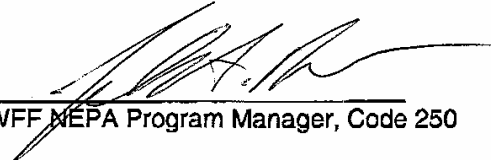
c. Is exempt from NEPA requirements under the provisions of:

\_\_\_\_\_

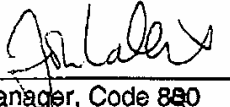
d. Has no significant environmental impacts as indicated by the results of an environmental checklist and/or detailed environmental analysis. (Attach checklist or analysis as applicable)

e. Will require the preparation of an Environmental Assessment.

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

  
\_\_\_\_\_  
WFF NEPA Program Manager, Code 250

4/19/07  
Date

  
\_\_\_\_\_  
Project Manager, Code 880

4/18/07  
Date

## NEPA Environmental Checklist (R&D Projects)

Project Name: Arctic Campaign

Date: April 18, 2007

Project Contact: John Valliant

Project Start Date: April 2007

Building Number and Location: D-1, room 219

Phone Number: 757-824-1376

Description of Project: See attached sheet

### Environmental Impacts:

*"Yes" responses may require the project to prepare an Environmental Assessment or conduct additional studies.*

#### A. Geologic:

- a. Greater than 10% change in topography or ground surface relief features? Yes [ ] Maybe [ ] No [ X ]  
b. Any increase in wind or water erosion of soils, either on or off site? Yes [ ] Maybe [ ] No [ X ]  
c. Changes in deposition, situation, or erosion that may modify the wetlands or bay? Yes [ ] Maybe [ ] No [ X ]

*Explain all "yes" and "maybe" answers:* \_\_\_\_\_

#### B. Air:

- a. Substantial air emissions or deterioration of ambient air quality? Yes [ ] Maybe [ ] No [ X ]  
b. The creation of objectionable odors? Yes [ ] Maybe [ ] No [ X ]  
c. Alteration of air movement, moisture, temperature, or any changes in climate, either locally or regionally? Yes [ ] Maybe [ ] No [ X ]

*Explain all "yes" and "maybe" answers:* \_\_\_\_\_

#### C. Water:

- a. Disturbance of groundwater? Yes [ ] Maybe [ ] No [ X ]  
b. Greater than 10% changes in absorption rates, drainage patterns, or the rate and amount of surface runoff? Yes [ ] Maybe [ ] No [ X ]  
c. Alter the course or flow of floodwaters? Yes [ ] Maybe [ ] No [ X ]  
d. Alteration of the direction or rate of ground water? Yes [ ] Maybe [ ] No [ X ]  
e. Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations? Yes [ ] Maybe [ ] No [ X ]  
f. Activities resulting in changes of greater than 10% of Center total potable water use (maximum 820,000 gallons/month)? Yes [ ] Maybe [ ] No [ X ]  
g. Any construction or other activity in a floodplain or wetland? Yes [ ] Maybe [ ] No [ X ]

*Explain all "yes" and "maybe" answers:* \_\_\_\_\_

#### D. Cultural Resources:

- a. Is the project located in an historic district or affects an existing landmark? Yes [ ] Maybe [ ] No [ X ]  
b. Will the project alter a building that is 50 years or older? Yes [ ] Maybe [ ] No [ X ]  
c. Is the project located in an area of suspected archaeological resources? Yes [ ] Maybe [ ] No [ X ]

*Explain all "yes" and "maybe" answers:* \_\_\_\_\_

#### E. Biological Resources:

- a. Construction/grading/filling within or adjacent to designated wetlands? Yes [ ] Maybe [ ] No [ X ]  
b. Reduction of the numbers of any rare, or endangered species? Yes [ ] Maybe [ ] No [ X ]  
c. Construction/grading/filling within open space or grasslands areas? Yes [ ] Maybe [ ] No [ X ]  
d. Introduction of new species or plants into an area, or impacts the normal replenishment of existing species? Yes [ ] Maybe [ ] No [ X ]  
e. Proposed construction activities in piping plover habitat? Yes [ ] Maybe [ ] No [ X ]  
f. Proposed construction activities within 600 feet of an eagle's nest? Yes [ ] Maybe [ ] No [ X ]  
g. Propose new landscaping or modify existing landscaping? Yes [ ] Maybe [ ] No [ X ]

*Explain all "yes" and "maybe" answers:* \_\_\_\_\_

#### F. Noise:

- a. A noise increase greater than 10% from an existing operation? Yes [ ] Maybe [ ] No [ X ]  
b. Exposure of people to severe noise levels (above 80 dBA)? Yes [ X ] Maybe [ ] No [ ]  
c. Increase existing CNEL noise contours surrounding the airfield? Yes [ ] Maybe [ ] No [ X ]

*Explain all "yes" and "maybe" answers:* Only at take-off and landing. Hearing protection required on airfield.

**G. Land Use:**

- a. Substantial alteration of the present or planned land use? Yes [ ] Maybe [ ] No [ X ]
- b. Increase in the rate of use of any natural resource? Yes [ ] Maybe [ ] No [ X ]
- c. Activities resulting in changes of greater than 10% of Center energy consumption (1,800,000 KWH of Main Base energy, 2,175,000 KWH of launch area energy, or 4,250,000 KWH of total energy)? Yes [ ] Maybe [ ] No [ X ]
- d. Activities resulting in a change in total employment levels greater than 10% (more than 95 people)? Yes [ ] Maybe [ ] No [ X ]

Explain all "yes" and "maybe" answers: \_\_\_\_\_

**H. Health and Safety:**

- a. Generation of ionizing or non-ionizing radiation? Yes [X] Maybe [ ] No [ ]
- b. Generate any air emissions? Yes [ ] Maybe [ ] No [ X ]
- c. Use of pesticides, including insecticides, herbicides, fungicides or rodenticides? Yes [ ] Maybe [ ] No [ X ]
- d. Confined space entry? Yes [ ] Maybe [ ] No [ X ]
- e. Risk of exposure to asbestos or lead containing materials? Yes [ ] Maybe [ ] No [ X ]
- f. Result in the exposure or disturbance of contaminated soil or ground water? Yes [ ] Maybe [ ] No [ X ]
- g. Generate industrial wastewater or storm water discharge? Yes [ ] Maybe [ ] No [ X ]
- h. Use of Class I ozone-depleting substances (CFC's, TCA, halons)? Yes [ ] Maybe [ ] No [ X ]
- i. Acquisition, use, or storage of any toxic or hazardous substance? Yes [ ] Maybe [ ] No [ X ]
- j. Generation of medical (biohazard), hazardous, toxic, or radiological wastes? Yes [ ] Maybe [ ] No [ X ]
- k. Use, disturbance, or disposal of PCBs? Yes [ ] Maybe [ ] No [ X ]
- l. Use of toxic gas? Yes [ ] Maybe [ ] No [ X ]

Explain all "yes" or "maybe" answers: Research topographic mapping system using a low power, high repetition rate frequency doubled Nd-YAG laser. This laser system is mounted inside a NASA P3B aircraft and transmits a conical laser scan below the aircraft at a 22 degree from nadir angle. The beam is scanned downward with nominal ocular hazard distance (NOHD) of 263 feet and terminated by the ground approximately 2000 feet below the aircraft. Laser operations onboard the NASA P3B aircraft are restricted to altitudes above 1200 feet above ground level (AGL), and nominal laser mapping operations are conducted at 2000 feet AGL or higher. The NOHD for the laser systems is 263 feet. The pilots are responsible for avoiding flight over air traffic at separations greater than the NOHD at all times. Pilots or laser operator can terminate laser operations when necessary to maintain safety..

**I. Transportation/Circulation:**

- a. Generation of substantial vehicle trips (over 620 per day)? Yes [ ] Maybe [ ] No [ X ]
- b. Affect existing parking facilities or demand for new parking? Yes [ ] Maybe [ ] No [ X ]
- c. Substantial impact upon existing transportation systems? Yes [ ] Maybe [ ] No [ X ]
- d. Increase in traffic hazards to motor vehicles, bicyclists, or pedestrians? Yes [ ] Maybe [ ] No [ X ]

Explain all "yes" and "maybe" answers: \_\_\_\_\_

**J. Services:**

- a. Affect or result in need for new or altered government-provided fire protection services? Yes [ ] Maybe [ ] No [ X ]
- b. Affect or result in need for new or altered government-provided security services? Yes [ ] Maybe [ ] No [ X ]

Explain all "yes" and "maybe" answers: \_\_\_\_\_

**K. Environmental Justice:**

- a. Does the project have the potential to disproportionately affect low-income populations or minority populations? Yes [ ] Maybe [ ] No [ X ]

Explain all "yes" and "maybe" answers: \_\_\_\_\_

## OVERVIEW OF THE ARCTIC CAMPAIGN

### 1.1 INTRODUCTION:

The Arctic Campaign will be a partial repeat of the calibration/validation flights flown during the Arctic2003 and Arctic2006 campaign. WFF will supply the P-3B aircraft, aircraft support, and project management. This project plan scope covers the WFF managed mission, which is scheduled to begin in April 2007 and will be repeated annually for the next five years.

### 1.2 OBJECTIVES

The overall WFF objective for the missions is to upload and fly five instruments over predetermined flight lines in Greenland (see Figure 1). The instrument suite is as follows:

- Global Ice Sheet Mapping Orbiter (GISMO) - Dr. Kenneth Jezek; Ohio State University
- Airborne Topographic Mapper 3, 4 (ATM3 & 4) - William Krabill; NASA WFF
- Coherent Antarctic Radar Depth Sounder (CARDS) – Dr. Prasad Gogineni; Kansas University
- Pathfinder Advanced Radar Ice Sounder (PARIS) – Dr. Keith Raney; Johns Hopkins University Applied Physics Laboratory

### 1.3 MISSION DESCRIPTION

The broad-scale goals of the Arctic missions are to look at the current topographic states of the Greenland and neighboring ice-sheets. This will be accomplished by measuring the surface elevation of the ice, using laser altimeters, and the bedrock elevation beneath the ice, using radar ice-sounders. By collecting both surface and subsurface data, the ice thickness can be determined, which contributes to knowledge of the ice-sheet volume. The data collected on the ice-sheet volume can then be compared to previous data, collected periodically since 1991, to determine the ice-sheet mass-balance. Mass-balance is the temporal delta of the ice, and describes the gain or loss of ice volume as a whole for the Island of Greenland. Arctic research data can be used exclusively, or in tandem with orbiting satellite data to look at the state of the ice-sheet.

# 2007 Planned Arctic Flights

Red: ATM Blue:GISMO

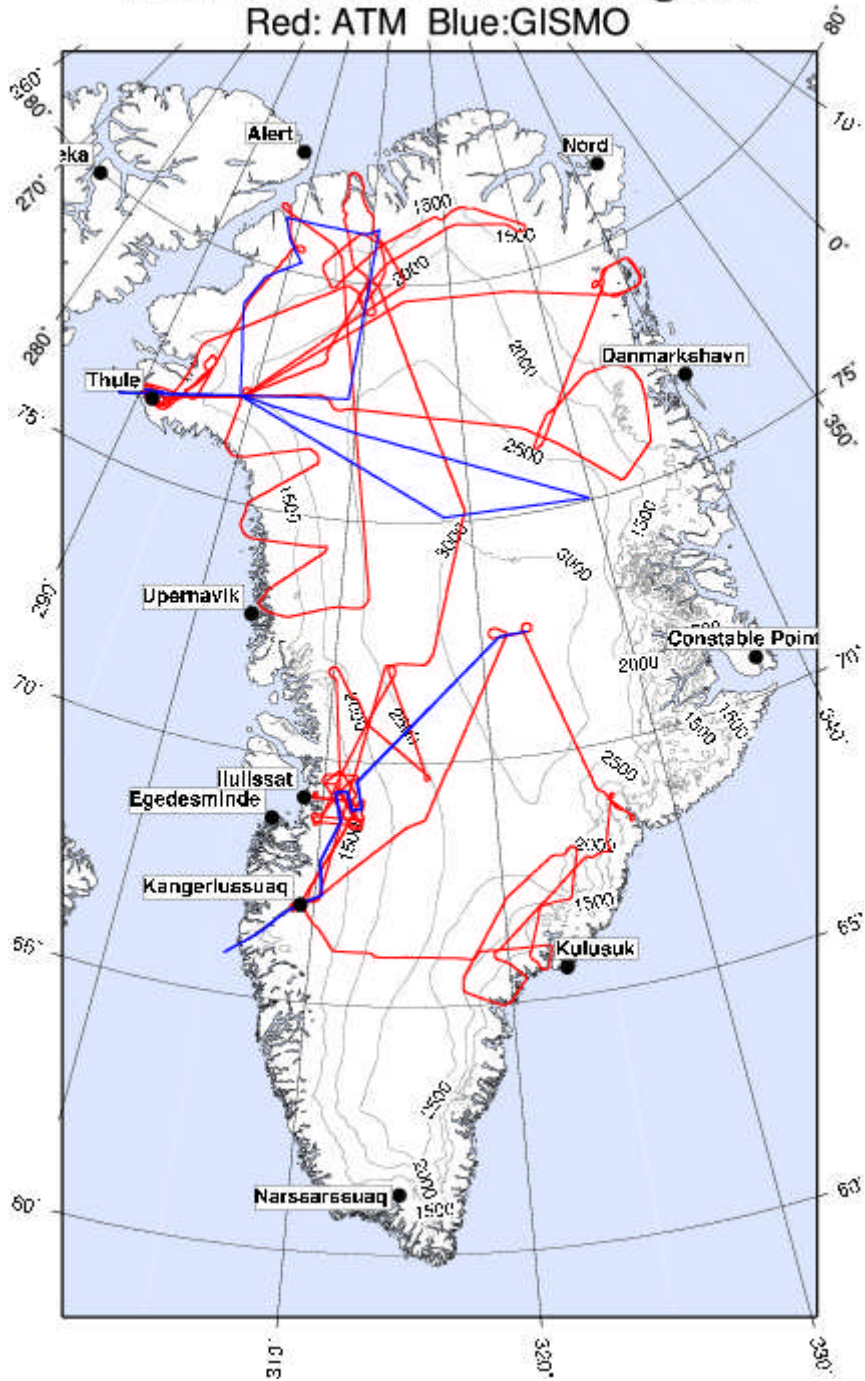


Figure 1: Sample Flight Path for Arctic Missions

Points of Contact:

Principal Investigator

William Krabill

Code 614.W

Wallops Flight Facility

Wallops Island, VA 23337

Tel: 757-824-1417

[William.B.Krabill@nasa.gov](mailto:William.B.Krabill@nasa.gov)

Mission Manager

John Valliant

Code 840

Wallops Flight Facility

Wallops Island, VA 23337

Tel: 757-824-1422

[John.Valliant.1@gsfc.nasa.gov](mailto:John.Valliant.1@gsfc.nasa.gov)