

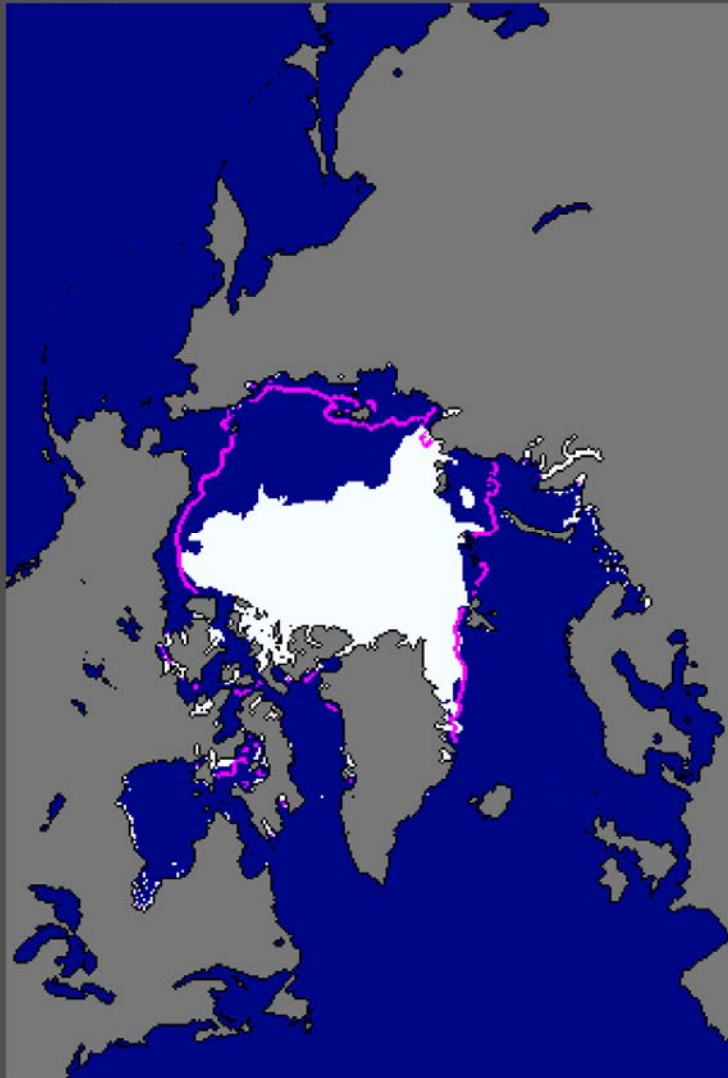
## **ARCPAC Planning Meeting 24 August 2007**

### **Outline:**

- 1) Very brief review of the key science questions (Chuck)**
- 2) Overview of flight schedule and profiles**
- 3) Instrumentation and integration, schedule (Tom)**
- 4) Facilities overview (Gerd)**
- 5) Other logistical issues (hazmats, shipping, security clearances, etc.)**
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# 21 August 2007 ice extent

Current Ice Extent  
08/21/2007



National Snow and Ice Data Center, Boulder, CO

Total extent = 4.9 million sq km

■ median  
ice edge

**Sea-ice extent this August is already at record low levels (<4.9 million km<sup>2</sup> vs. previous low of 5.2 million km<sup>2</sup>)**

**Annual minimum occurs in mid-September.**

**Thick, multi-year ice is also at record lows.**

**Ice-free Arctic summers by 2030? Yikes!**

ARCPAC: Aerosol, Radiation, and Cloud  
Processes affecting Arctic Climate

**Science and Implementation Plan**



<http://www.esrl.noaa.gov/csd/ARCPAC/>

**A NOAA Climate Forcing Program Project  
for the International Polar Year 2008**

June 2007

# ARCPAC

**NOAA's airborne mission to  
the Arctic for the  
International Polar Year**

*The question:* Are aerosol  
and aerosol-cloud process-  
es significantly contributing  
to Arctic warming and sea  
ice melting?

*The response:* An airborne  
mission that makes use of  
our unique capabilities to  
study relevant processes  
and observationally  
constrain climate models

# Science Questions to be Addressed

## Primary Questions:

***Q1: What are the chemical, optical, and microphysical characteristics of aerosols in the Arctic in springtime?***

***Q2: What are the source types (industrial, urban, biomass/biofuel, dust, sea-salt) of the aerosol components, and the absorbing components (soot) in particular?***

***Q3: What are the microphysical and optical characteristics of optically thin clouds in the lower Arctic troposphere in springtime, and how do aerosol particles affect these cloud properties and vice versa?***

## Secondary Questions:

~~***Q4: What are the concentrations of particles that serve as ice nuclei (IN) in background and polluted air, and is soot an effective IN?***~~

***Q5: What halogen chemistry is occurring during Arctic spring?***

## Linkages with other IPY efforts

### Fairbanks

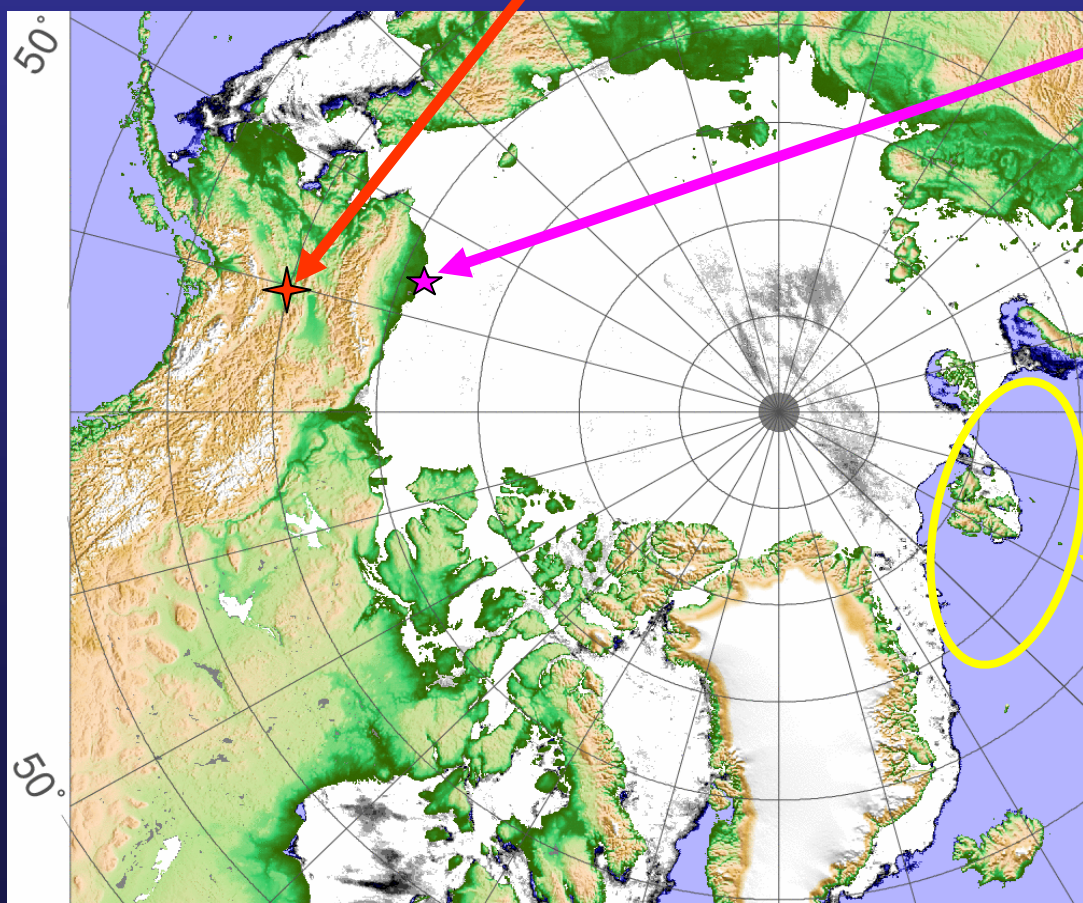


- *In situ process studies*
- *Soot, clouds, tracers*
- *Vertical structure*
- *NASA, Environ. Canada*

### Barrow



- *Long-term monitoring of aerosols, trace gases*
- *Remote sensing of clouds, radiation*
- *DOE, Environ. Canada*



### Greenland & Barents Seas

- *Fresher pollution: aerosols, trace gases*
- *Remote sensing of clouds, radiation*



## Air Quality Aspects

While this is primarily a climate research project, NOAA's Air Quality Program has overlapping interests and is contributing significantly to covering program expenses.

*Will use the payload to investigate cold-weather particle properties and processes in Denver, Fairbanks, and Prudhoe Bay.*

*Expect increased role by nitrates and semi-volatile organics due to partitioning and relative lack of gas-phase SO<sub>2</sub> oxidation.*

*First application of P-3 aerosol payload in the Rocky Mountain urban areas.*

*Lays groundwork for potential future Front Range aerosol study (surface or Erie Tower), and California 2010 campaign where nitrates and organics often dominate.*

# Flight Hours and Breakdown

**~120 hrs total**

**35 hrs transit Tampa--Metro (JeffCo)-- ? --Fairbanks and return**

**85 hours local science**

**~10 hours Front Range area**

**~75 hours (9x 8.3 hr flights) Fairbanks area**

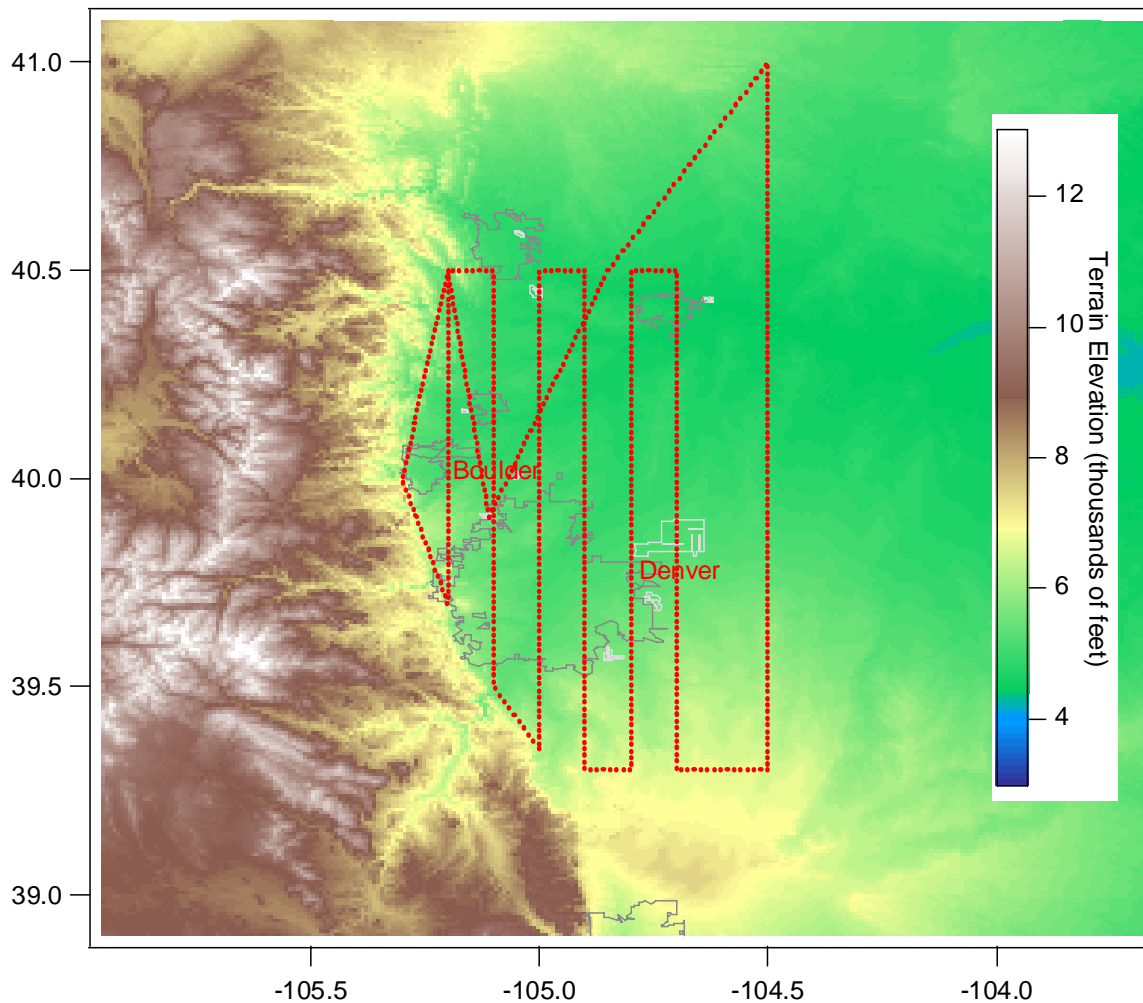
**Key dates:**

**28 March arrive in Fairbanks**

**1 April begin science flights**

**23 April depart Fairbanks**

**Tom Ryerson will present more detailed schedule.**



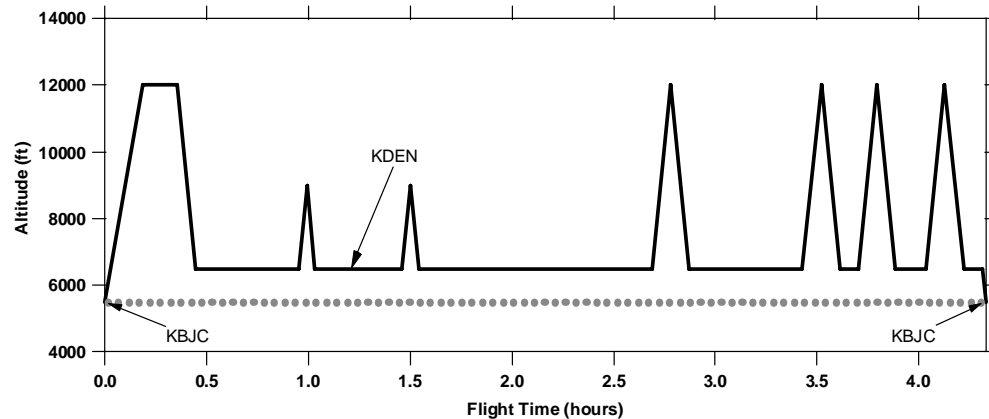
## 2008 Denver urban survey flights

- 2 flights, 4-6 hours duration each

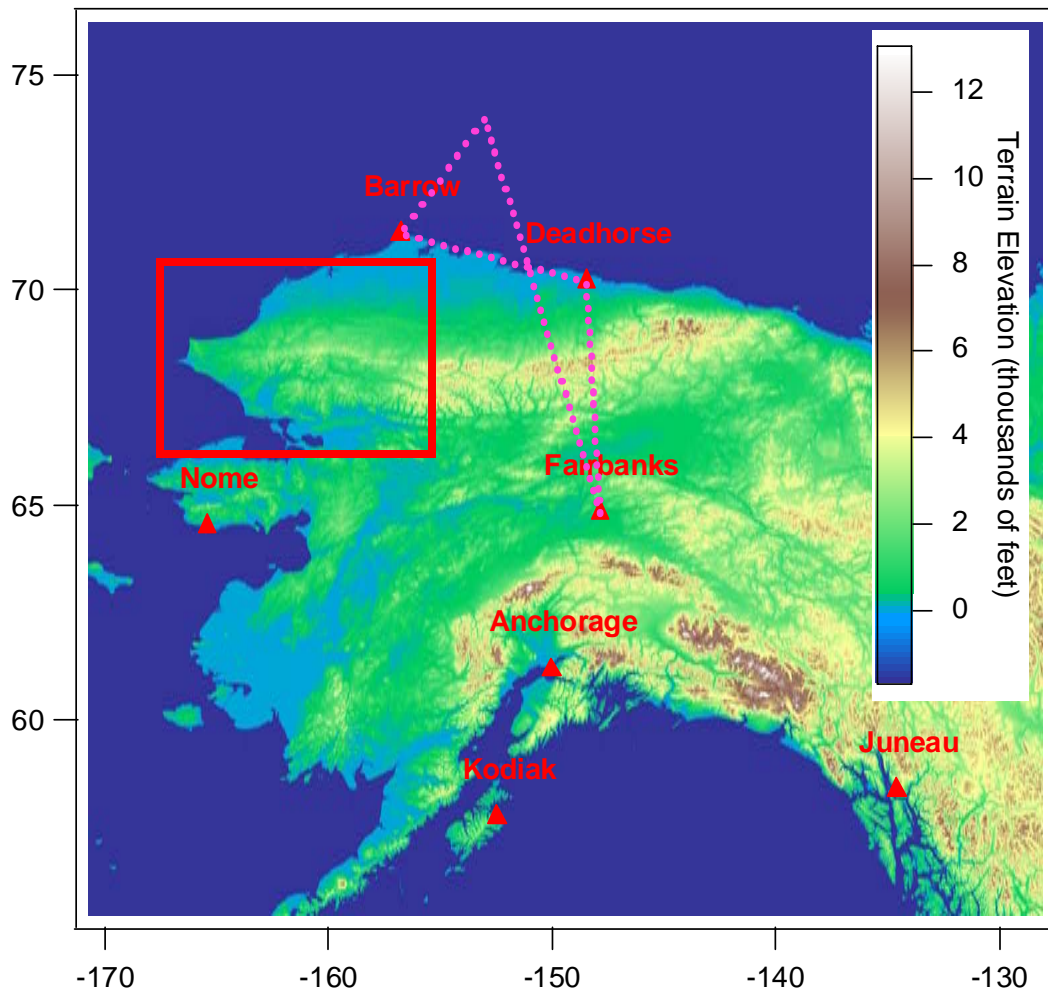
- Long crosswind transects at minimum safe altitude

- Short profiles to 9000'-12000' MSL and return

- Pollution pushed up against Front Range

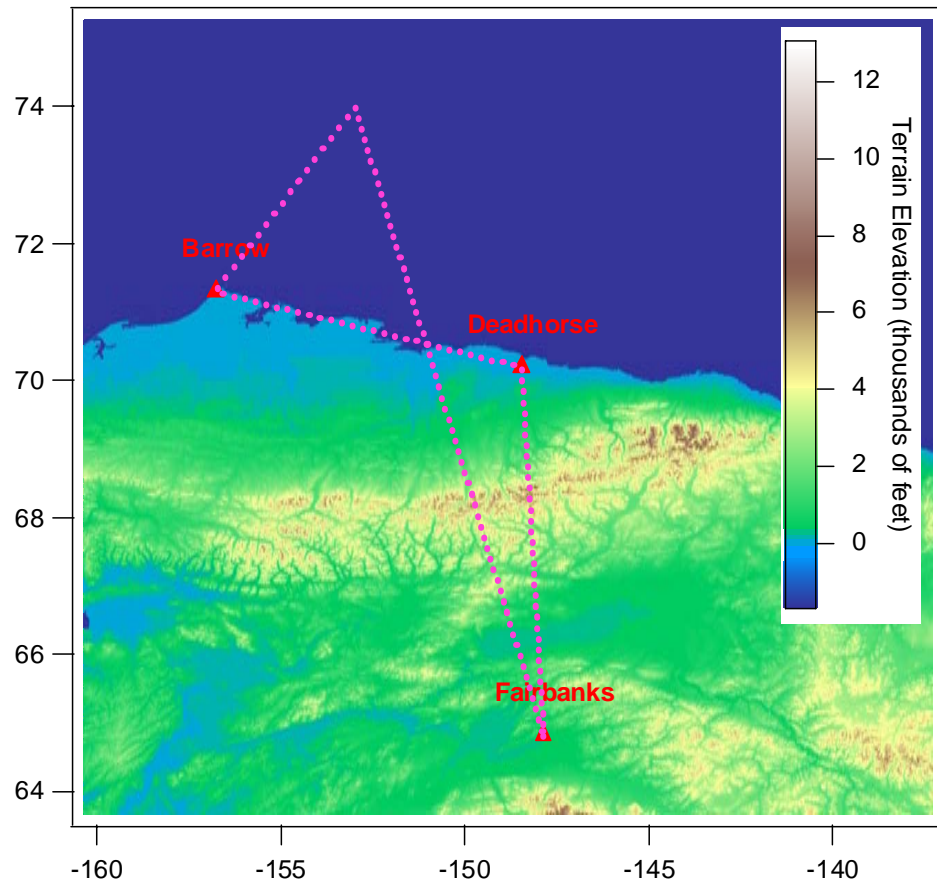






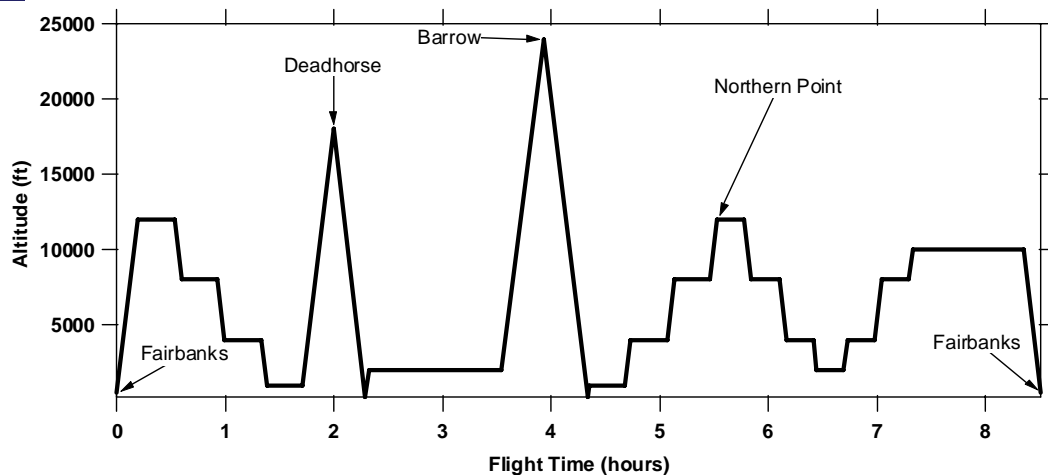
## 2008 Arctic flights

- 8 to 8.5 hours duration
- Long, stairstep transects hunting for pollution layers
- Profiles to 18-25,000' over Deadhorse & Barrow
- Penetrations of thin stratiform clouds

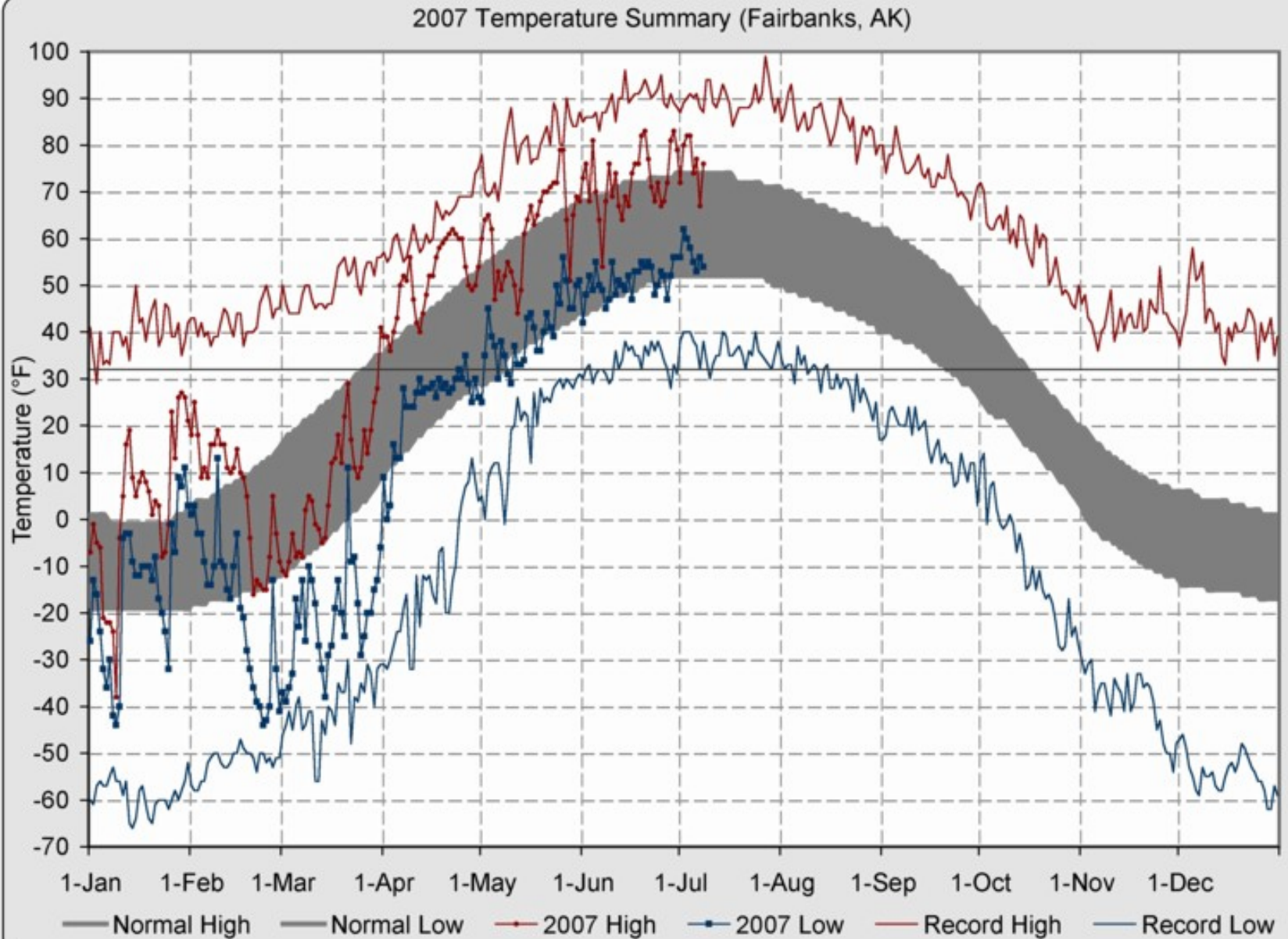


## 2008 Arctic flights

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# Some Logistical Notes



## Some Logistical Notes

| Fairbanks | Sunrise | Sunset |
|-----------|---------|--------|
| 1 April   | 06:05   | 19:46  |
| 23 April  | 04:45   | 20:56  |

**No nighttime flights!**

**Passports should be obtained/up-to-date in case of stops in Canada (note very long processing times--apply *now*. Visa implications?)**

**University of Alaska-Fairbanks very supportive--facilities, waste handling. Suggest we reciprocate with seminars/tours, project updates, etc.**

**Will be sharing space (hangar and office/lab) with NASA, DOE/Environment Canada. Might be outnumbered 4:1 at times.**

**We are spreading management load:**

- **Chuck Brock and Dan Murphy--project organization, science leads**
- **Ann Middlebrook--security clearances**
- **John Nowak and Andy Neuman--hazmats shipping, storage, acquisition**
- **Gerd Hübler--facilities and shipping**
- **Cathy Burdorf--IT and office infrastructure**
- **Chuck Brock--flight safety training and medical clearances**
- **Tom Ryerson--aircraft instrument coordinator**

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## P-3 integration and scheduling - ARCPAC 2008

- Expect to receive a few emails in the next days and weeks:
  - IPY integration and deployment schedule (version 1)
  - New P-3 Installation Guide and questionnaire  
*questionnaire due **Monday, October 1, 2007***
  - MacDill clearance forms

- These and other necessary documents are posted:

<http://www.esrl.noaa.gov/csd/ARCPAC/>

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name and password required - see emails

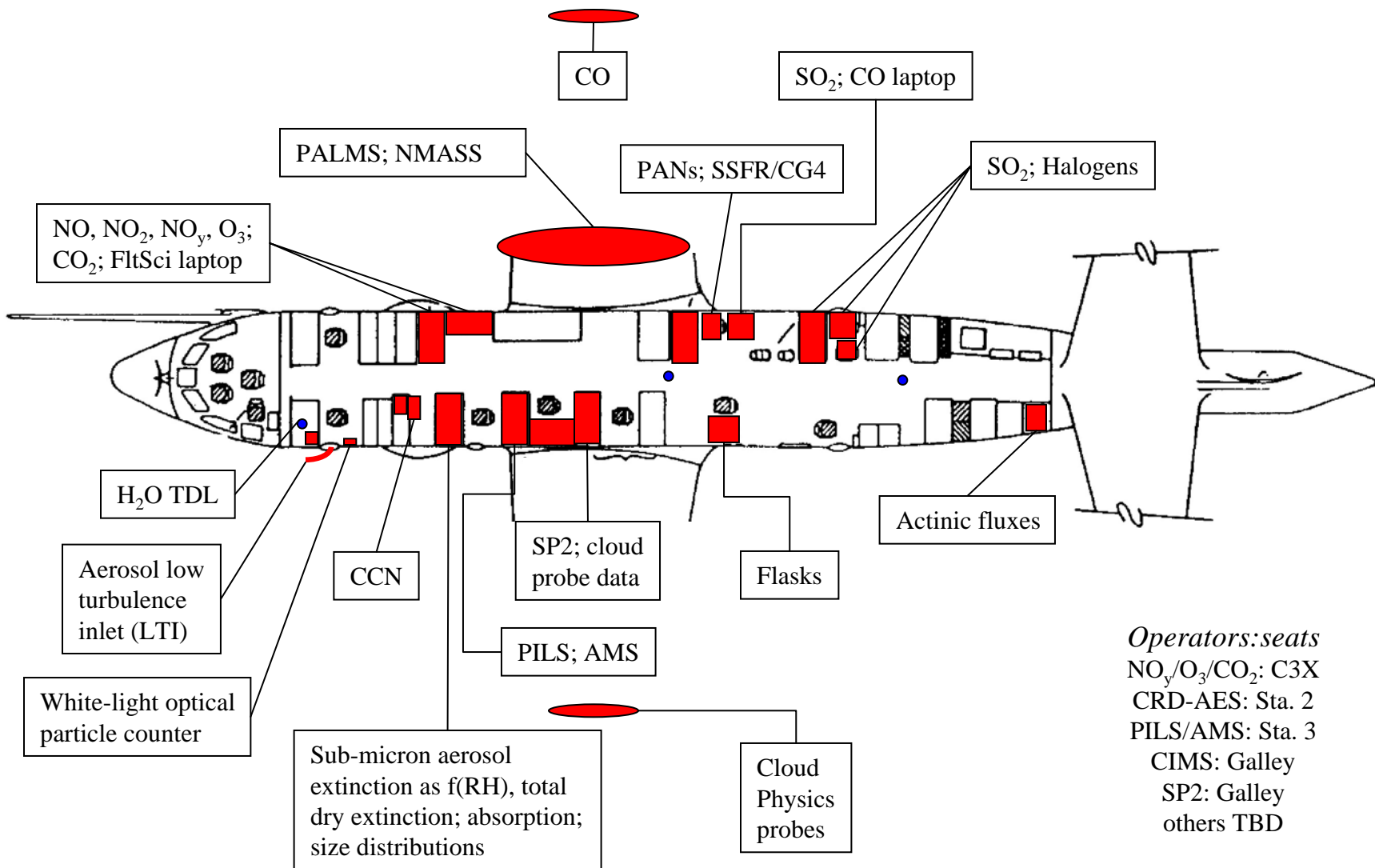
- Other things still being worked out:
  - MacDill, Jeffco, and Fairbanks hazmat policies
  - Jeffco and Fairbanks security clearances

# N43RF layout - IPY 2008

NOAA-CSD

version 3

8-08-2007



## P-3 schedule summary

- **Integration *tentatively* begins Tuesday, January 22**

8 weeks of integration

working hours will be M-F, 8 hours/day

specific instrument's schedule TBD

*(may try to install selected instruments prior to Jan. 22)*

- **Transit to Denver - Thursday, March 20**

- **Transit to Fairbanks - Friday, March 28**

*(may require refueling stop en route)*

- **Transit to Denver - Wednesday, April 23**

*(may require refueling stop en route)*

un-install at NCAR RAF facility



IPY 2008 N43RF target schedule v1

| <i>Sun.</i> | <i>Mon.</i>    | <i>Tues.</i> | <i>Wed.</i> | <i>Thurs.</i> | <i>Fri.</i> | <i>Sat.</i> |
|-------------|----------------|--------------|-------------|---------------|-------------|-------------|
| Jan<br>2008 |                | 1            | 2           | 3             | 4           | 5           |
| 6           | 7              | 8            | 9           | 10            | 11          | 12          |
| 13          | 14             | 15           | 16          | 17            | 18          | 19          |
| 20          | 21             | 22           | 23          | 24            | 25          | 26          |
|             | <i>MLK Day</i> | ???          |             |               |             |             |
| 27          | 28             | 29           | 30          | 31            |             |             |

IPY integration

IPY integration

IPY 2008 N43RF target schedule v1

2 of 4

|             | <i>Sun.</i>                | <i>Mon.</i>                        | <i>Tues.</i>        | <i>Wed.</i> | <i>Thurs.</i> | <i>Fri.</i> | <i>Sat.</i>                   |
|-------------|----------------------------|------------------------------------|---------------------|-------------|---------------|-------------|-------------------------------|
| Feb<br>2008 |                            |                                    |                     |             |               | 1           | 2<br><i>Groundhog<br/>Day</i> |
| 3           | 4                          | 5                                  | 6                   | 7           | 8             | 9           |                               |
|             | ← IPY integration →        |                                    |                     |             |               |             |                               |
| 10          | 11                         | 12                                 | 13                  | 14          | 15            | 16          |                               |
|             | ← IPY integration →        |                                    |                     |             |               |             |                               |
| 17          | 18                         | 19                                 | 20                  | 21          | 22            | 23          |                               |
|             | <i>President's<br/>Day</i> | <i>Hangar door<br/>replacement</i> | ← IPY integration → |             |               |             |                               |
| 24          | 25                         | 26                                 | 27                  | 28          | 29            |             |                               |
|             | ← IPY integration →        |                                    |                     |             |               |             |                               |

# IPY 2008 N43RF target schedule v1

|                                      | <i>Sun.</i> | <i>Mon.</i> | <i>Tues.</i>    | <i>Wed.</i> | <i>Thurs.</i>     | <i>Fri.</i>              | <i>Sat.</i>                           |
|--------------------------------------|-------------|-------------|-----------------|-------------|-------------------|--------------------------|---------------------------------------|
| March 2008                           |             |             |                 |             |                   |                          | 1                                     |
| 2                                    | 3           | 4           | IPY integration |             | 6                 | 7                        | 8                                     |
| 9                                    | 10          | 11          | IPY integration |             | 13                | 14                       | 15                                    |
| <i>Daylight Savings</i>              |             |             |                 |             |                   |                          |                                       |
| 16                                   | 17          | 18          | AOC preparation |             | 20                | 21                       | 22                                    |
|                                      |             |             |                 | CSD packing | transit to Jeffco | Air freight 1 arrives AK | 2-day truck arrives CO                |
| 23                                   | 24          | 25          | Denver          |             | 27                | 28                       | 29                                    |
| first flight in CO?<br><i>Easter</i> |             |             |                 |             | CSD packing       | transit to AK            | Fairbanks<br>Air freight 2 arrives AK |

IPY 2008 N43RF target schedule v1

| <i>Sun.</i>         | <i>Mon.</i>     | <i>Tues.</i>                            | <i>Wed.</i>                | <i>Thurs.</i>            | <i>Fri.</i> | <i>Sat.</i> |
|---------------------|-----------------|---|----------------------------|--------------------------|-------------|-------------|
| 30<br>April<br>2008 | 31              | 1<br>Fairbanks<br>first flight<br>in AK | 2                          | 3                        | 4           | 5           |
| 6                   | 7               | 8<br>Fairbanks                          | 9                          | 10                       | 11          | 12          |
| 13                  | 14              | 15<br>Fairbanks<br>Tax Day              | 16                         | 17                       | 18          | 19          |
| 20                  | 21<br>Fairbanks | 22<br>CSD packing                       | 23<br>transit<br>to Jeffco | 24<br>IPY de-integration | 25          | 26          |
| 27                  | 28              | 29                                      | 30                         | 31                       |             |             |

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UAF & NWS



## Fairbanks International Airport, Fairbanks, Alaska



Red circle indicates the old Everts Air Fuel aircraft hangar. Office space is street-side of the whole hangar front













# Lodging

- Sophie's Station:  
<http://www.fountainheadhotels.com/sophie/sophie.htm>
- NOAA & CIRES: Bernie Johnson will do the reservation for everyone in CSD whatever their group affiliation
- People outside NOAA/CIRES: Please, make your own arrangements
- Chuck has preliminary participants list, I will contact every group to verify

# Transportation Logistics

- MacDill, Denver/Boulder, Fairbanks:
  - as before shipments to and from all sites, fast & slow, incl. hazmat
  - you know the drill for MacDill and Boulder areaBut fast transport to AK only via air = expensive  
PLEASE, try to economize: share tools, fittings, etc. wherever possible

Gases will go to AK overland direct from vendor, roads are open in winter, but delays due to winterstorms might occur

We will need to know your special needs: what can't leave before the aircraft takes off but must arrive before the aircraft lands. I will send out query to all