

NOMINAL FLIGHT PLANS FOR TRACE-P

Version 1 (28 September, 2000)

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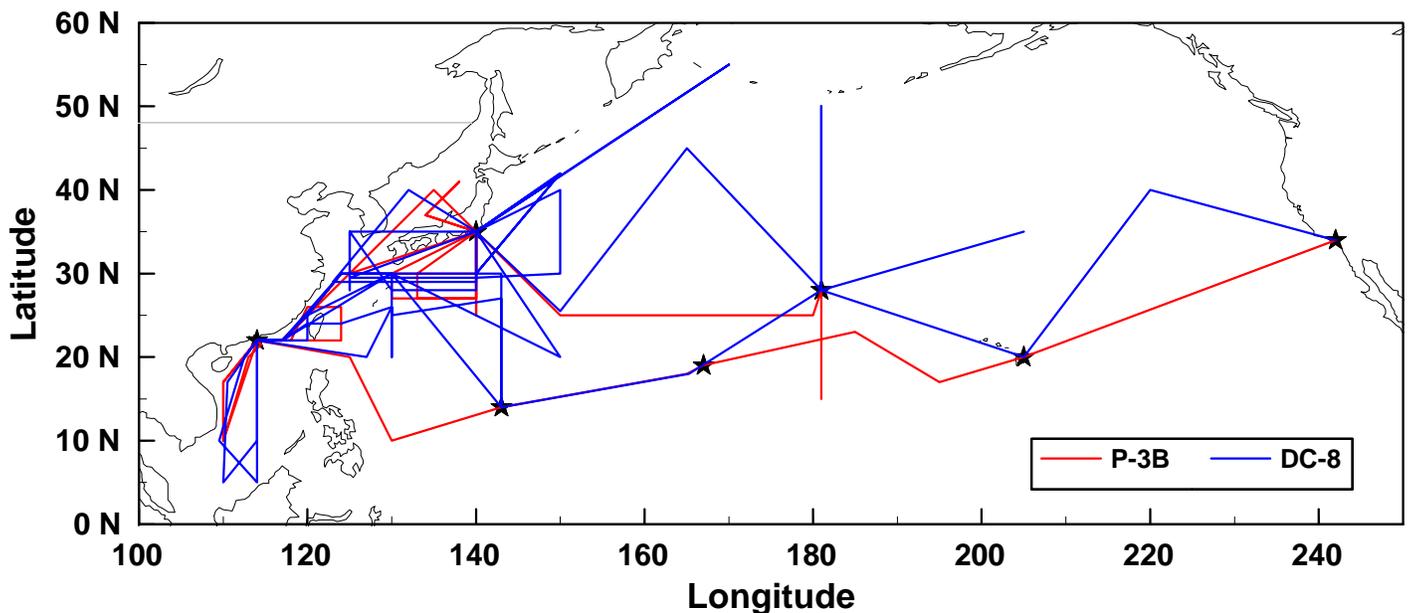
General considerations:

- The two aircraft will span the altitude ranges 1-39K (DC-8) and 0.5-26K (P-3B).
- Ascent/descent rates will normally be 1500 fpm (DC-8) and 1000 fpm (P-3B).

Each flight leg is accompanied by one of the following terms describing the aircraft's general pattern of flight:

- A **Wall** will consist of a succession of back-and-forth legs at different altitudes separated by spirals. It will typically include 3 or 4 legs of 10-20 min each.
- An **Extended wall** will consist of a forward and a return track along the same path, each including a succession of legs at different altitudes and generally no spirals.
- An **In-Progress Wall** will typically include a succession of level legs (10-20 min long) at different altitudes as the aircraft moves between way points
- **Lidar Support** is used to describe DC-8 tracks conducted at high altitudes to provide in-flight information for guiding the P-3B.
- The term **Ferry** describes periods when the aircraft is moving between way points in the most direct manner possible.

A composite map of the proposed flights is shown below. Each flight is addressed separately in the following documentation. Note: Flight dates correspond to the IDL-E values contained in the deployment schedule.



Feb 22: P-3 flight 4, WFF - Dryden

Title: Transit

Duration: 7 hours

Description: Straight transit.

P-3B Legs

Wallops (37N, 76W) to Dryden (34N, 118W); Ferry

NO MAP

Feb 24: P-3 flight 5 and DC-8 flight 4, Dryden-Hilo

Title: Asian outflow over E Pacific

Duration: 8.5 hours (P-3), 8 hours (DC-8)

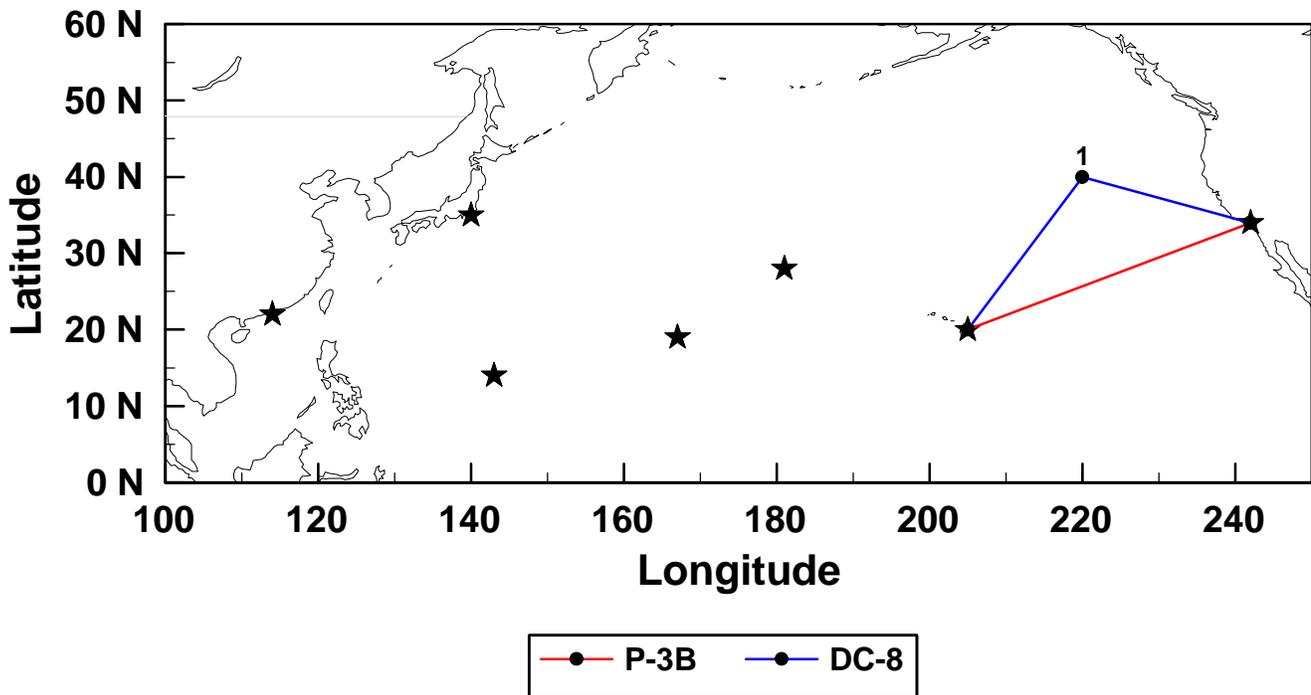
Description: The aircraft will sample aged Asian air masses over the East Pacific. The P-3 will focus on subsiding subtropical air. The DC-8 will sample the fast westerly flow at midlatitudes.

P-3B Legs

Dryden (34N, 118W) to Hilo (20N, 155W);
In-Progress Wall

DC-8 Legs

Dryden (34N, 118W) to 1 (40N, 140W);
In-Progress Wall
1 (40N, 140W) to Hilo (20N, 155W);
In-Progress Wall



Feb 26: P-3 flight 6 Hilo - Wake

Title: Subsidence over central Pacific

Duration: 8.5 hours

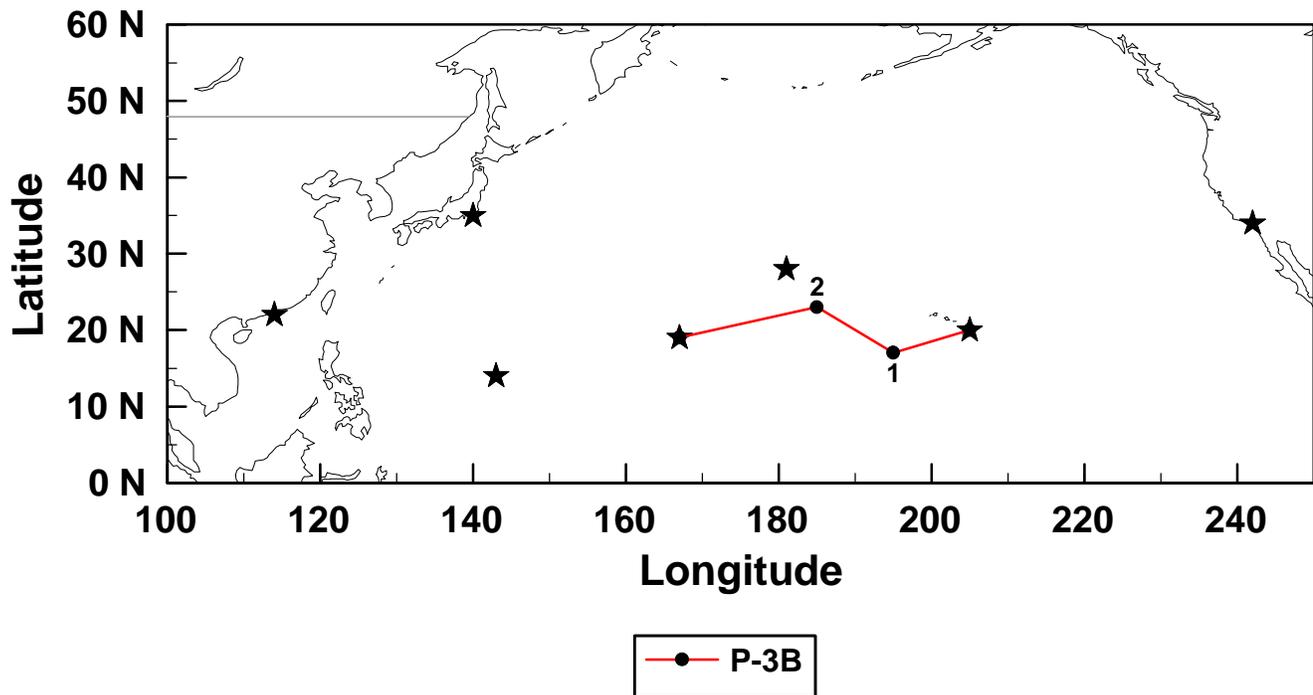
Description: The P-3 will sample subsiding subtropical air masses and measure tropical-subtropical latitudinal gradients over the central Pacific.

P-3B Legs

Hilo (20N, 155W) to 1 (17N, 165W); In-Progress Wall

1 (17N, 165W) to 2 (23N, 175W); In-Progress Wall

2 (23N, 175W) to Wake (19N, 167E); In-Progress Wall



Feb 27: P-3 flight 7, Wake-Guam, and DC-8 flight 5, Hilo-Guam

Title: Aged Asian outflow and tropical boundary layer

Duration: 6 hours (P-3), 10 hours (DC-8)

Description: The P-3 will examine the subtropical/tropical transition with particular focus on the boundary layer. The DC-8 will overfly Midway and sample high-altitude Asian outflow. Intercomparison between the two aircraft will be conducted on an in-progress wall between Wake and Guam with three 20-min level legs from 20K to 1K.

P-3B Legs

Wake (19N, 167E) to 1 (18N, 165E); Ferry

1 (18N, 165E) to Guam (14N, 143E);

In-Progress Wall/Intercomparison

DC-8 Legs

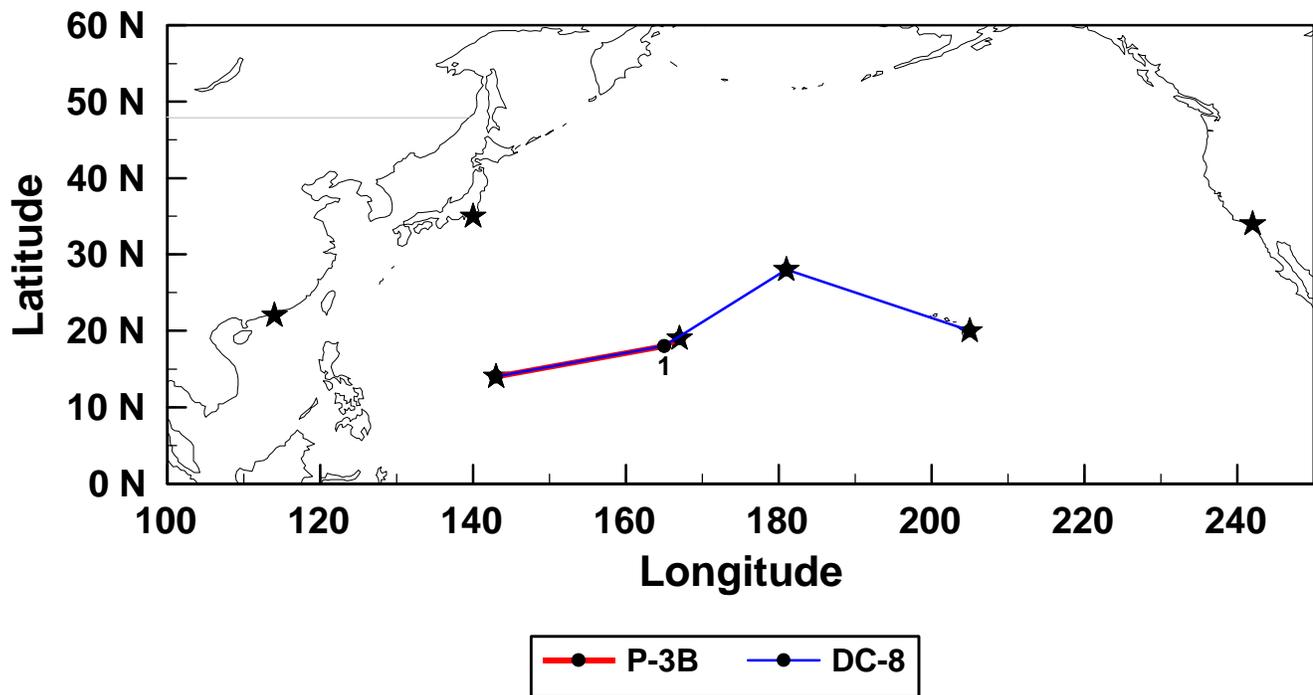
Hilo (20N, 155W) to Midway (28N, 179W); Ferry

Midway (28N, 179W) to 1 (18N, 165E);

In-Progress Wall

1 (18N, 165E) to Guam (14N, 143E);

In-Progress Wall/Intercomparison



Mar 1: P-3 flight 8 and DC-8 flight 6, Guam-HK

Title: Philippines and China outflow

Duration: 8 hours (P-3), 7 hours (DC-8)

Description: The P-3 will sample outflow from the Philippines during a leg along the coast. The DC-8 will sample biomass burning and southern China outflow en route to Hong Kong.

P-3B Legs

Guam (14N, 143E) to 1 (10N, 130E);

In-Progress Wall

1 (10N, 130E) to 2 (20N, 125E); In-Progress Wall

2 (26N, 124E) to HK (22N, 114E); In-Progress Wall

DC-8 Legs

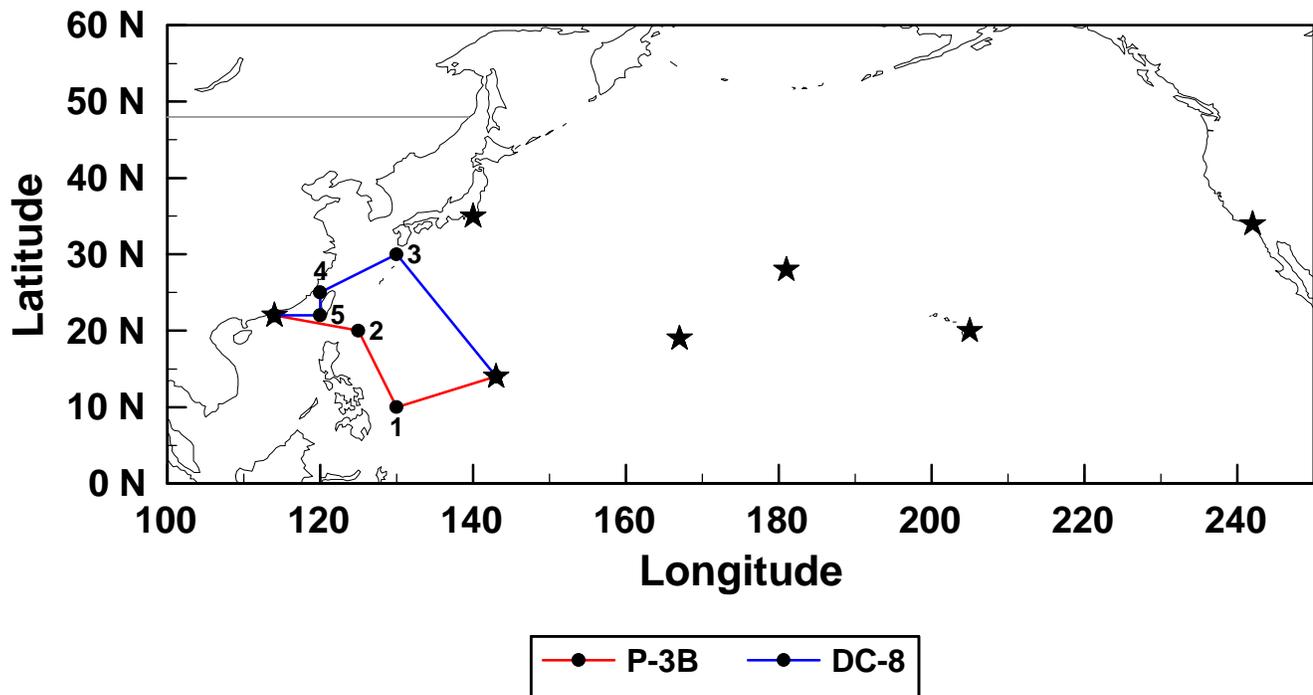
Guam (14N, 143E) to 3 (30N, 130E);

In-Progress Wall

3 (30N, 130E) to 4 (25N, 120E); Ferry

4 (25N, 120E) to 5 (22N, 120E); Wall

5 (22N, 120E) to HK (22N, 114E); Ferry



Mar 4: P-3 flight 9 and DC-8 flight 7, HK local 1

Title: Frontal outflow and Taiwan

Duration: 8 hours (P-3), 8 hours (DC-8)

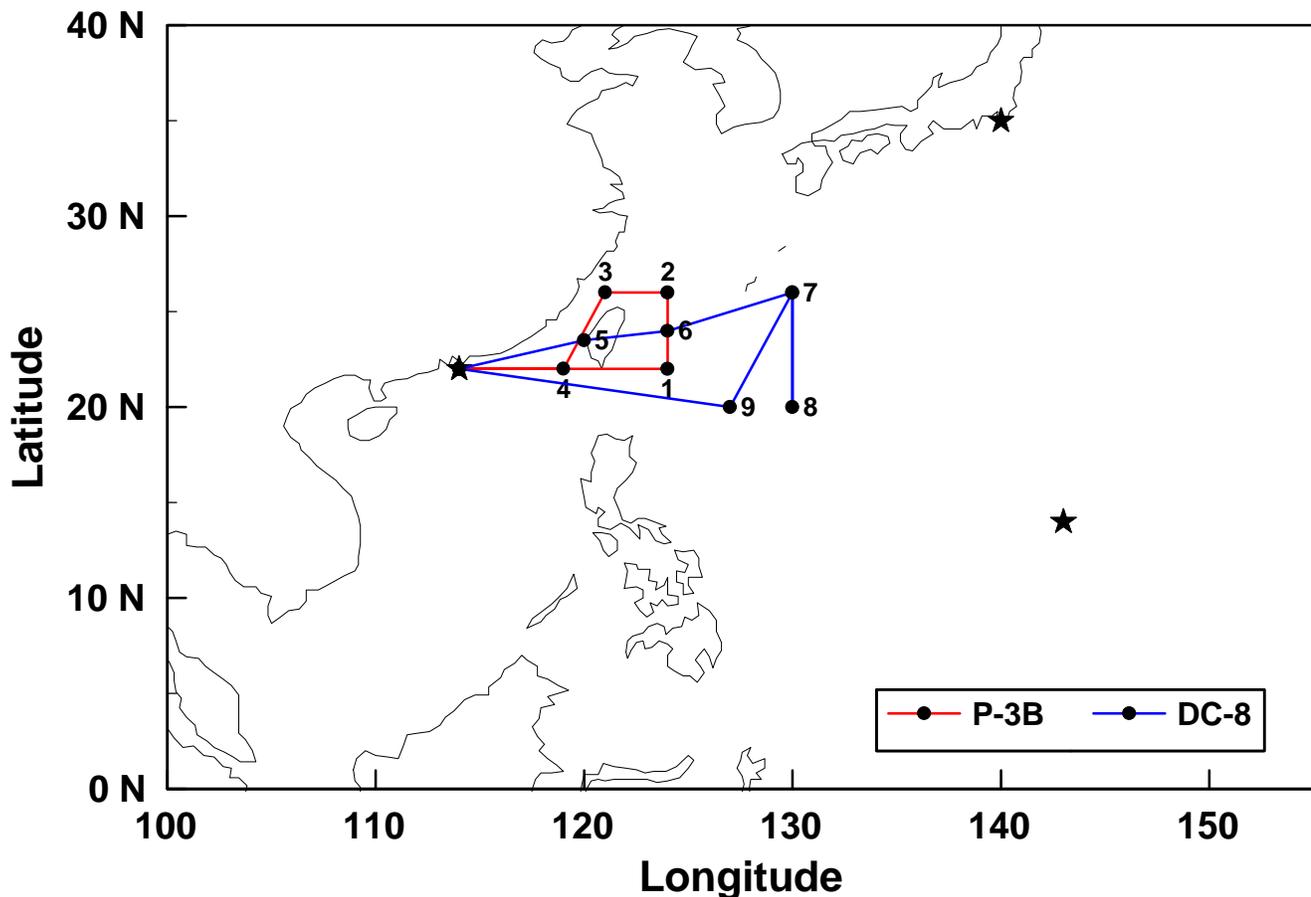
Description: The aircraft will set up walls to sample outflow from China, Taiwan, and SE Asia associated with a cold front. The P-3 will sample outflow close to the China coast and downwind of Taiwan, the DC-8 will sample the outflow further downwind.

P-3B Legs

HK (22N, 114E) to 1 (22N, 124E); Ferry
1 (22N, 124E) to 2 (26N, 124E); Wall
2 (26N, 124E) to 3 (26N, 121E); Ferry
3 (26N, 121E) to 4 (22N, 119E); Wall
4 (22N, 119E) to HK (22N, 114E); Ferry

DC-8 Legs

Base (22N, 114E) to 5 (24N, 120E); Ferry
5 (24N, 120E) to 6 (24N, 124E); Lidar Support
6 (24N, 124E) to 7 (26N, 130E); Ferry
7 (26N, 130E) to 8 (20N, 130E); Extended Wall
8 (20N, 130E) to 9 (20N, 127E); Ferry
9 (20N, 127E) to HK (22N, 114E); In-Progress Wall



Mar 6: P-3 flight 10 and DC-8 flight 8, HK local 2 (suitcase to Guam for DC-8)

Title: China outflow a.m.

Duration: 8 hours (P-3), 10 hours (DC-8)

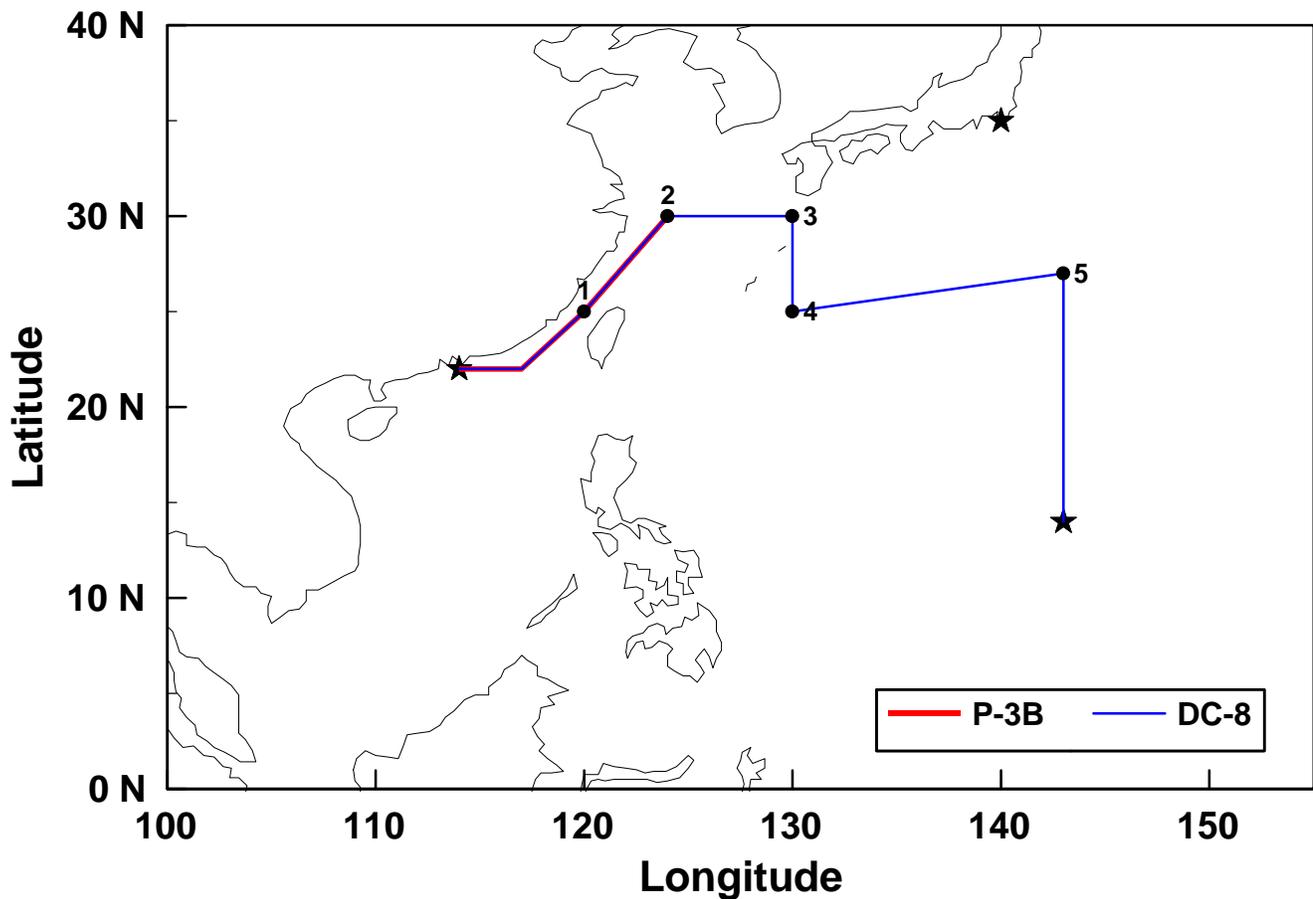
Description: The flight will sample outflow from China associated with passage of a cold front. The P-3 will sample the outflow with a wall close to the coast from HK to Shangai. Sampling will be done during the morning hours including sunrise. The DC-8 will initially provide lidar support, then will set up a wall to sample the aged outflow, will cross the frontal boundary, and land in Guam.

P-3B Legs

HK (22N, 114E) to 1 (25N, 120E); Ferry
1 (25N, 120E) to 2 (30N, 124E); Wall
1 (25N, 120E) to HK (22N, 114E); Ferry

DC-8 Legs

HK (22N, 114E) to 2 (30N, 124E); Lidar Support
2 (30N, 124E) to 3 (30N, 130E); Ferry
3 (30N, 130E) to 4 (25N, 130E); Wall
4 (25N, 130E) to 5 (27N, 143E); Ferry
5 (27N, 143E) to Guam (14N, 143E);
In-Progress Wall



Mar 7: P-3 flight 11 and DC-8 flight 9, HK local 3 (suitcase from Guam for DC-8)

Title: China outflow p.m.

Duration: 8 hours (P-3), 6 hours (DC-8)

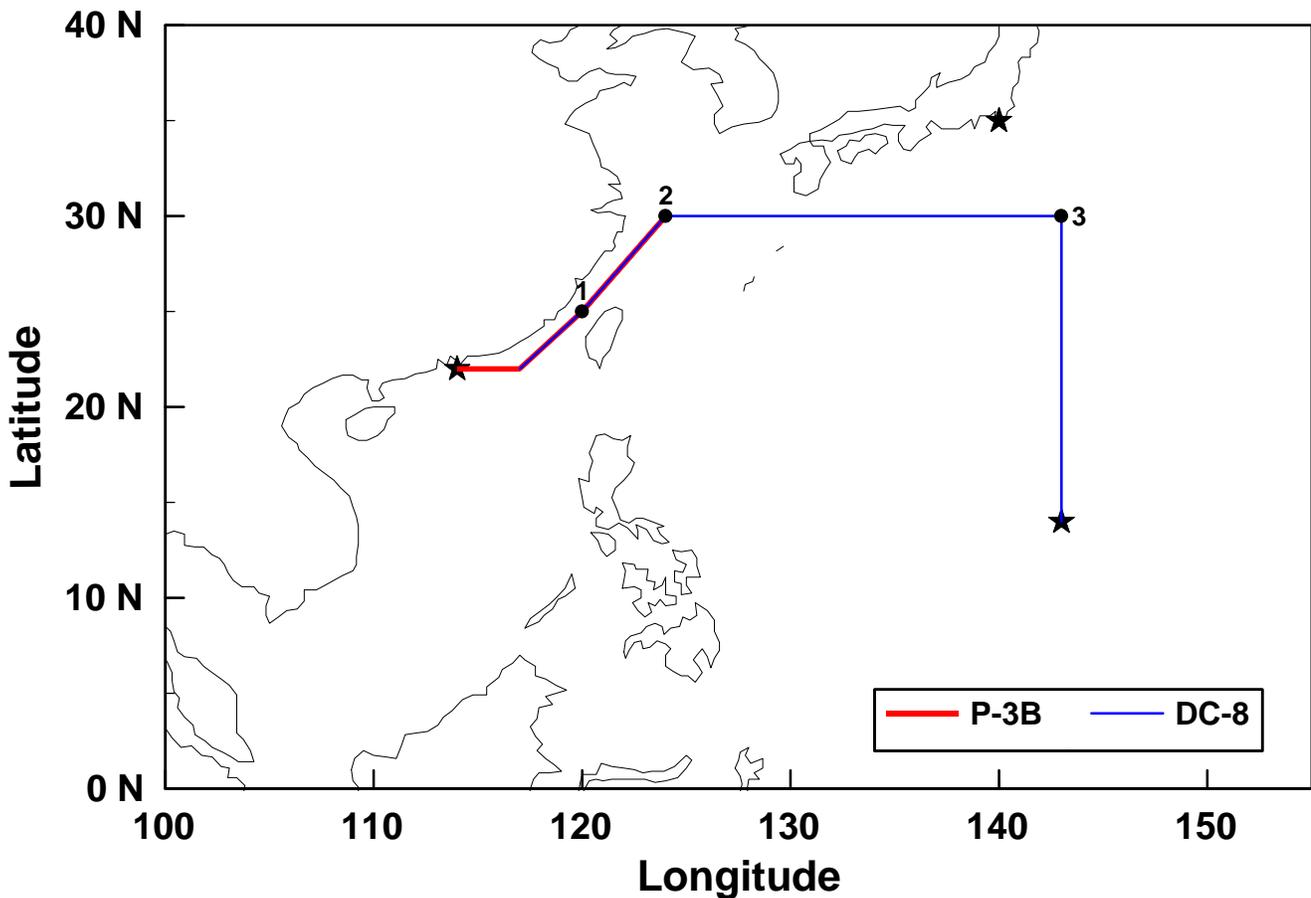
Description: The flight will sample outflow from China associated with passage of a cold front. The P-3 will sample the outflow with a wall close to the coast from HK to Shanghai. Sampling will be done during the afternoon/evening hours including sunset. The DC-8 will sample the outflow at different distances from the coast while returning from Guam and will provide lidar support for the P-3 for the near-coastal wall.

P-3B Legs

HK (22N, 114E) to 1 (25N, 120); Ferry
1 (25N, 120E) to 2 (30N, 124E); Wall
1 (25N, 120E) to HK (22N, 114E); Ferry

DC-8 Legs

Guam (14N, 143E) to 3 (30N, 143E);
In-Progress Wall
3 (30N, 143E) to 2 (30N, 124E); In-Progress Wall
2 (30N, 124E) to 1 (25N, 120E); Lidar Support
1 (25N, 119E) to HK (22N, 114E); Ferry



Mar 11: P-3 flight 12 and DC-8 flight 10, HK local 4

Title: South China outflow and biomass burning.

Duration: 8 hours (P-3), 8 hours (DC-8)

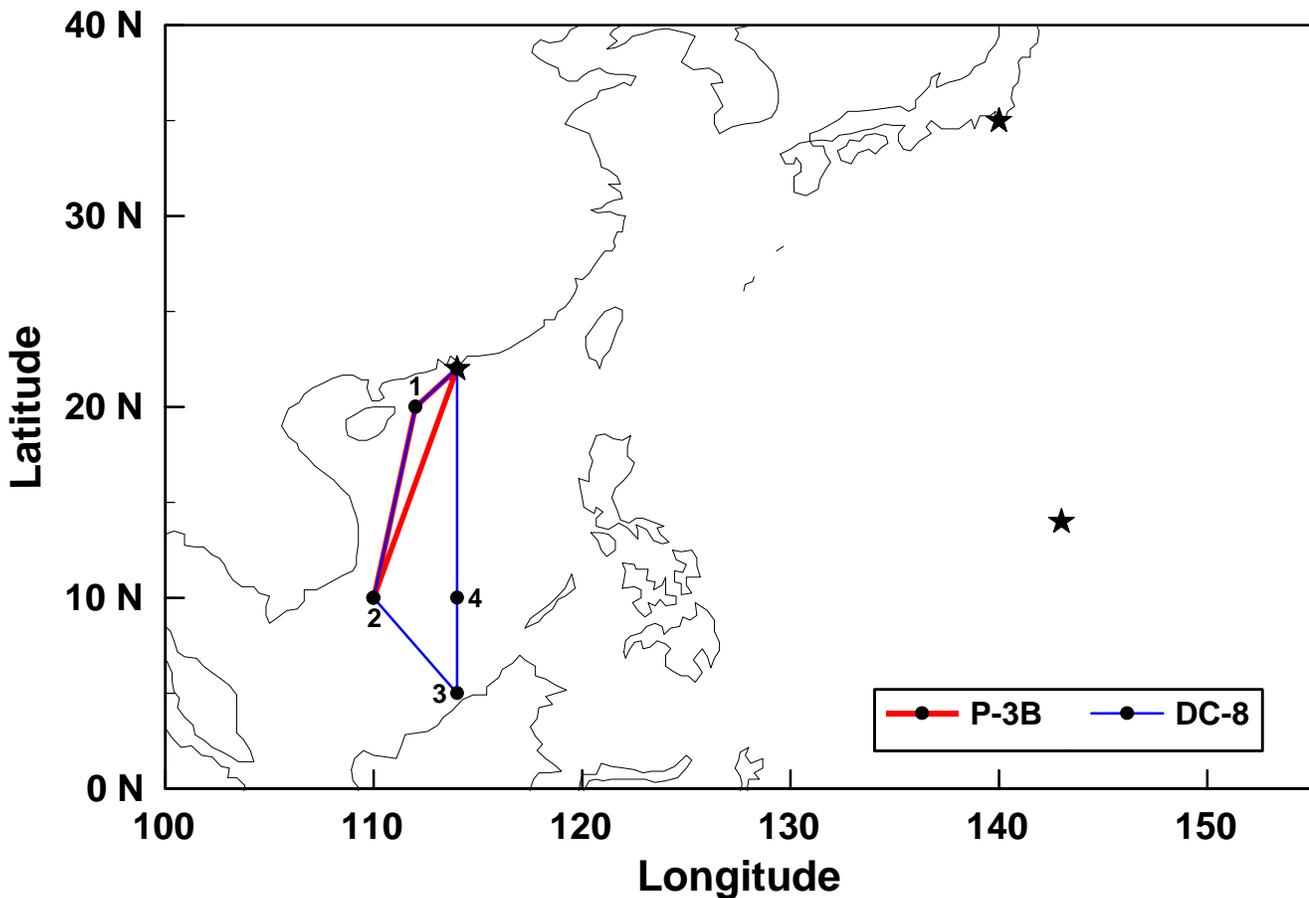
Description: The P-3 will set up a wall to sample low-altitude northerly outflow from China and will use an in-progress wall to sample biomass burning outflow from SE Asia. The DC-8 will provide lidar support and investigate high-altitude tropical outflow associated with deep convection.

P-3B Legs

HK (22N, 114E) to 1 (20N, 112E); Wall
1 (20N, 112E) to 2 (10N, 110E); Extended Wall
1(20N, 112E) to HK (22N, 114E); Ferry

DC-8 Legs

HK (22N, 114E) to 1 (20N, 112E); Lidar Support
1 (20N, 112E) to 2 (10N, 110E); Lidar Support
2 (20N, 112E) to 3 (5N, 114E); In-Progress Wall
3 (5N, 114E) to 4 (10N, 114E); Wall
4 (10N, 114E) to HK (22N, 114E); In-Progress Wall



Mar 14: P-3 flight 13 and DC-8 flight 11, HK local 5

Title: SE Asia biomass burning outflow

Duration: 8 hours (P-3), 8 hours (DC-8)

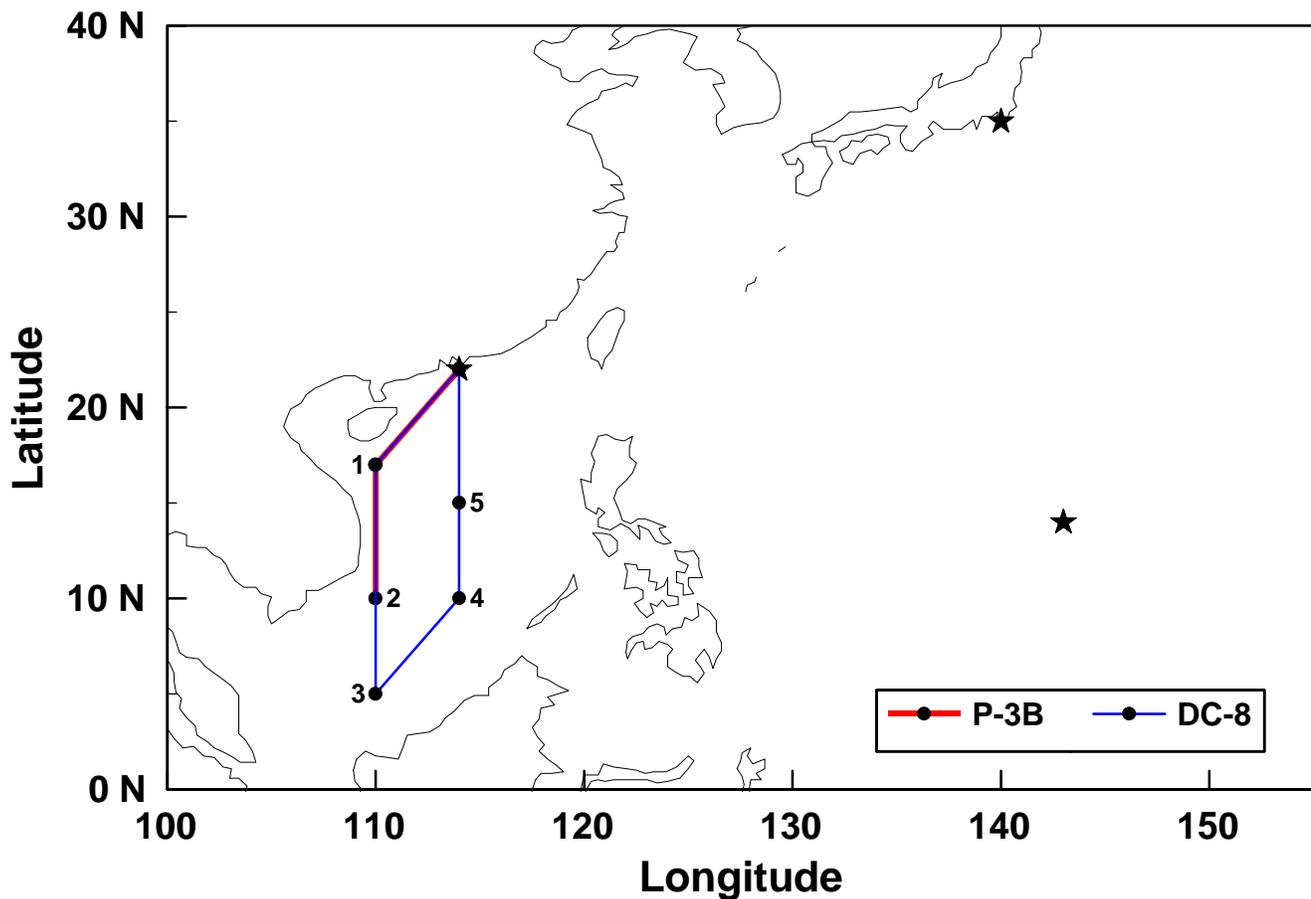
Description: The P-3 will sample outflow from SE Asia with in-progress walls close to the coast. The DC-8 will provide lidar support, will sample convective outflow at higher altitudes including possibly long-range transport from Africa and ITCZ outflow, and will conduct a wall off the coast to examine near-field chemical aging of SE Asian outflow.

P-3B Legs

HK (22N, 115E) to 1 (17N, 110E); Ferry
1 (17N, 110E) to 2 (10N, 110E); Extended Wall
1 (17N, 110E) to HK (22N, 110E); In-Progress Wall

DC-8 Legs

HK (22N, 115E) to 1 (17N, 110E); Ferry
1 (17N, 110E) to 3 (5N, 110E); Lidar Support
3 (5N, 110E) to 4 (10N, 114E); In-Progress Wall
4 (10N, 114E) to 5 (15N, 114E); Wall
5 (15N, 114E) to HK (22N, 114E); In-Progress Wall



Mar 17: P-3 flight 14 and DC-8 flight 12, HK-Yokota

Title: China and Korea outflow

Duration: 8 hours (P-3), 10 hours (DC-8)

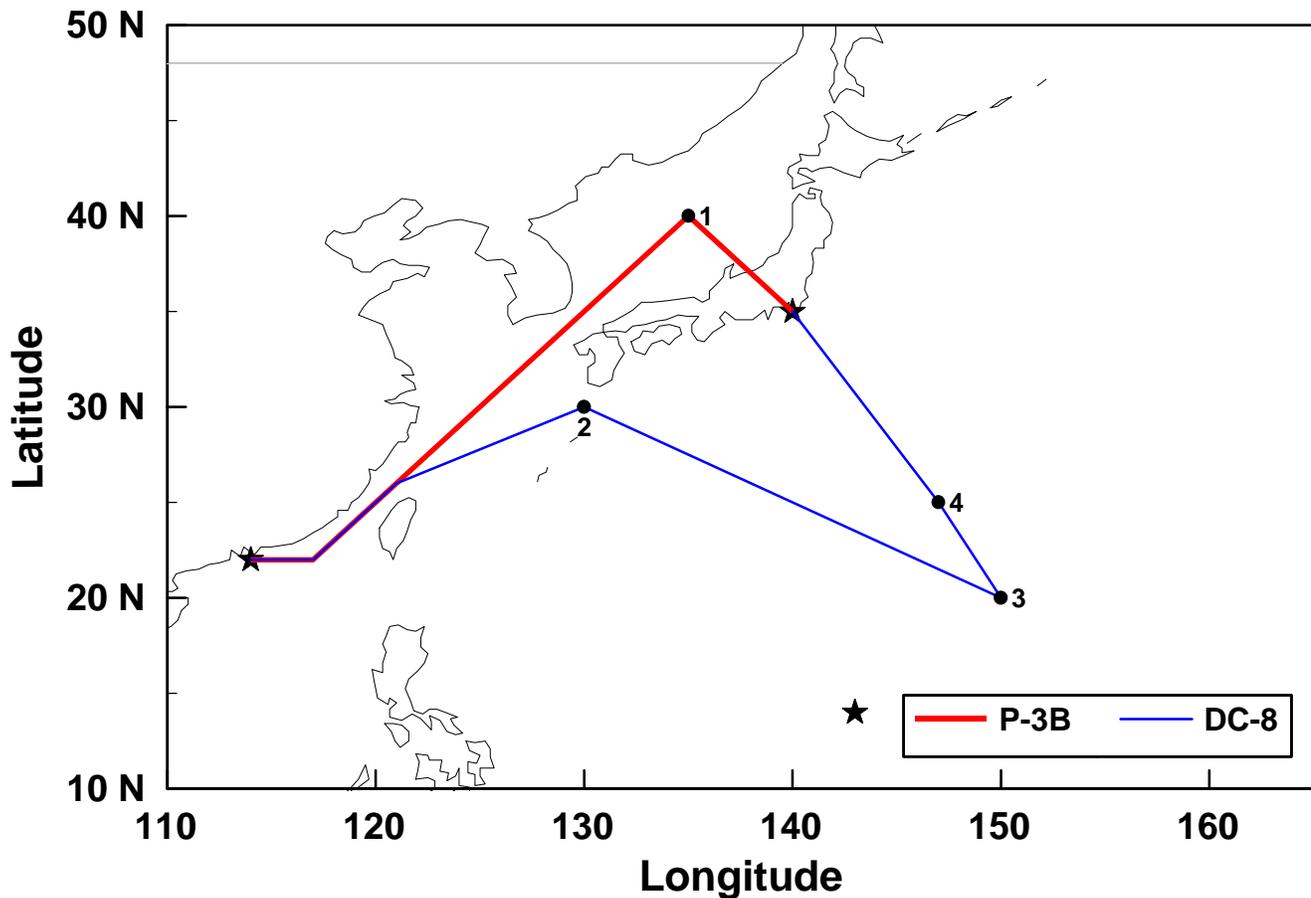
Description: The P-3 will sample outflow along the China and Korean coasts with in-progress walls and including a Japan overflight. The DC-8 will sample outflow from southern China with a wall close to the coast and another wall further downwind.

P-3B Legs

HK (22N, 115E) to 1 (40N, 135E); In-Progress Wall
1 (40N, 135E) to Yokota (35N, 140E);
In-Progress Wall

DC-8 Legs

HK (22N, 115E) to 2 (30N, 130E); Wall
2 (30N, 130E) to 3 (20N, 150E); In-Progress Wall
3 (20N, 150E) to 4 (25N, 147E); Wall
4 (25N, 147E) to Yokota (35N, 140E); In-Progress
Wall



Mar 20: P-3 flight 15 and DC-8 flight 13, Yokota local 1

Title: Japan inflow/outflow

Duration: 8 hours (P-3), 8 hours (DC-8)

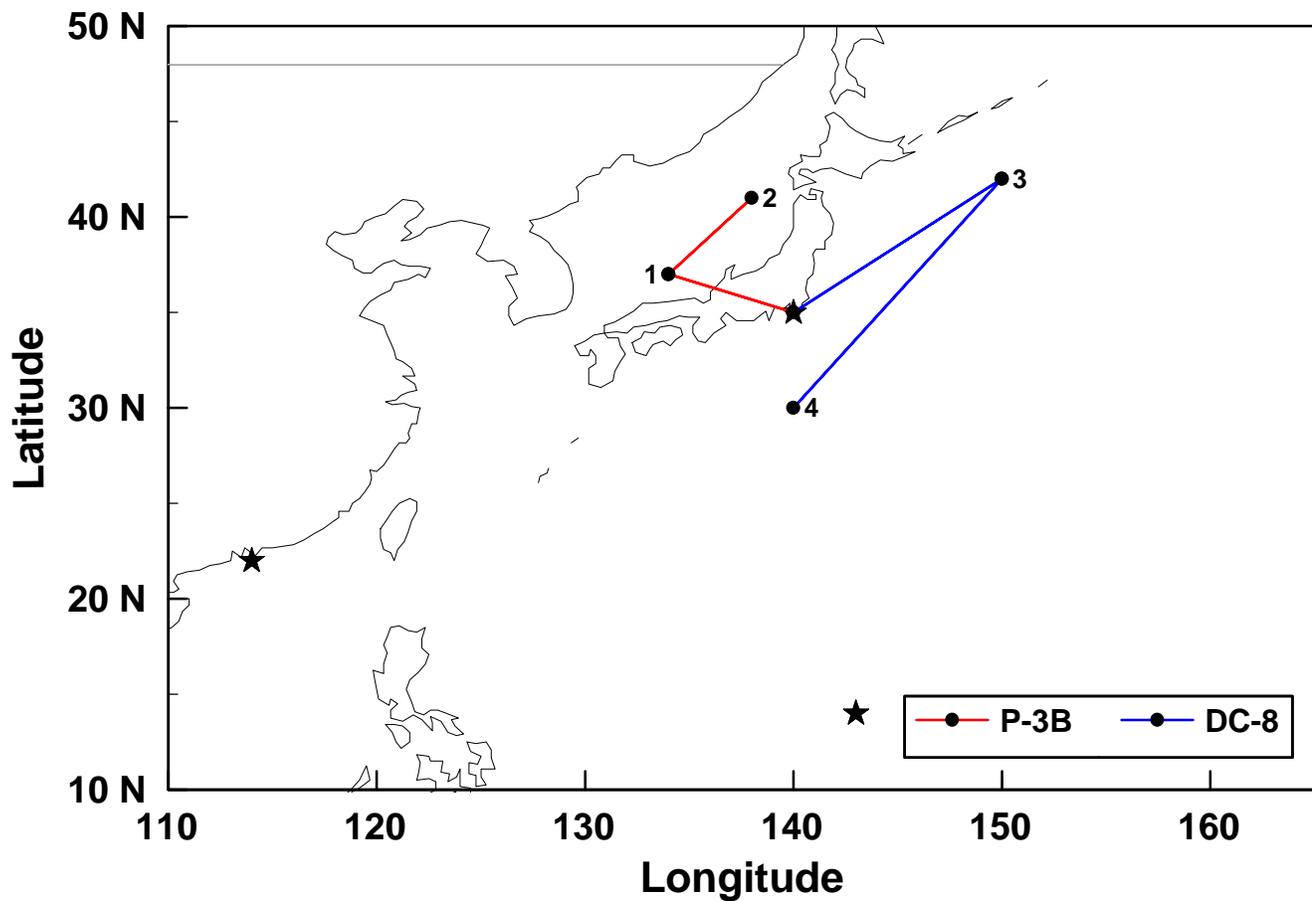
Description: The P-3 and DC-8 will set up walls on both sides of Japan under conditions of westerly flow to sample Asian outflow both upwind and downwind of Japan.

P-3B Legs

Yokota (35N, 140E) to 1 (37N, 134E); Ferry
1 (37N, 134E) to 2 (41N, 139E); Wall
1 (37N, 134E) to Yokota (35N, 140E); Ferry

DC-8 Legs

Yokota (35N, 140E) to 3 (42N, 150E); Ferry
3 (42N, 150E) to 4 (30N, 140E); Extended Wall
3 (42N, 150E) to Yokota (35N, 140E); Ferry



Mar 22: P-3 flight 16 and DC-8 flight 14, Yokota local 2

Title: Frontal crossing and subsidence

Duration: 8 hours (P-3), 10 hours (DC-8)

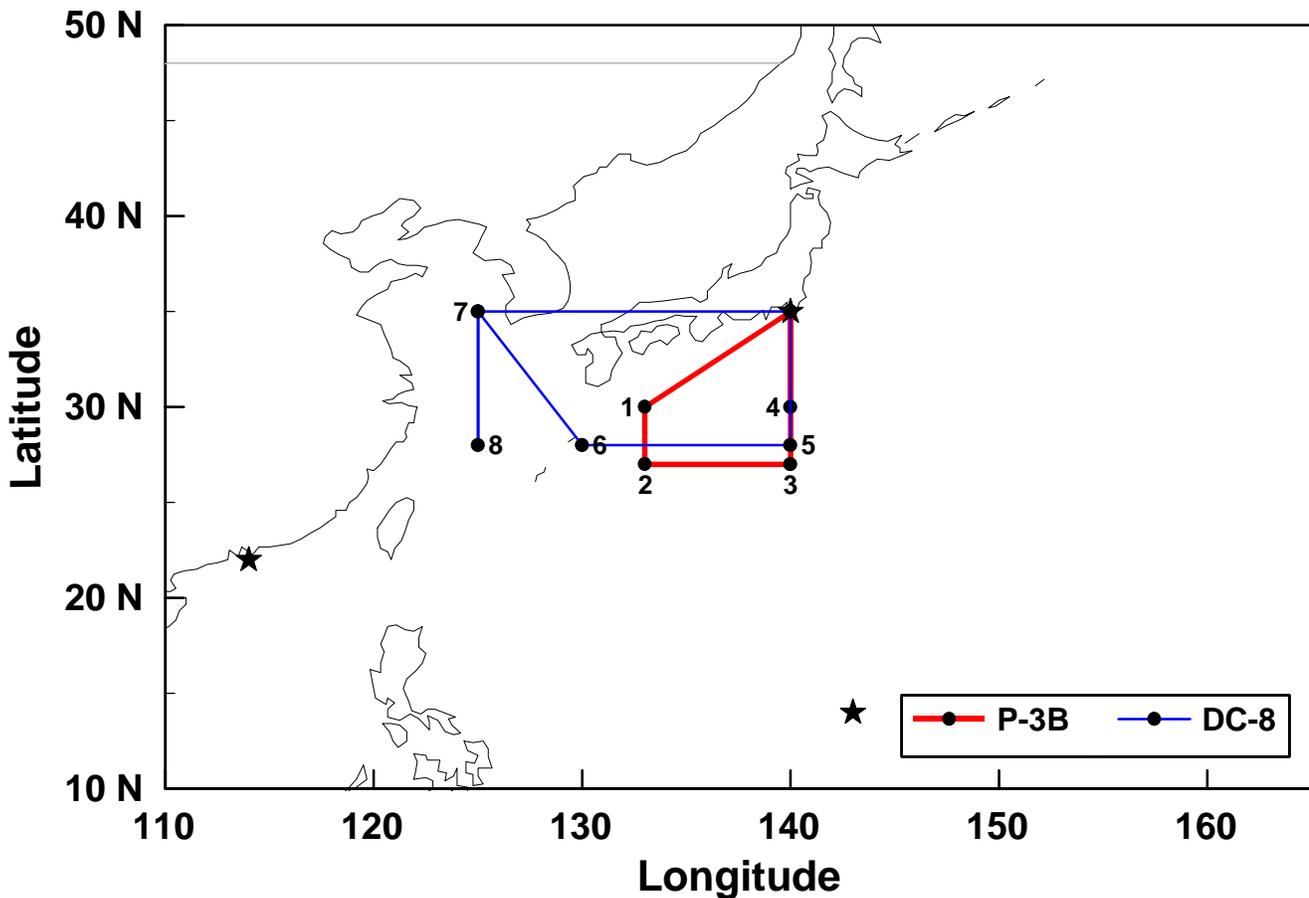
Description: The P-3 will set up short walls on both sides of the front emphasizing the lower troposphere. The DC-8 will map the cross-frontal transition using lidar and set up an extended wall behind the front. Intercomparison between the two aircraft will be conducted along the first P-3 wall.

P-3B Legs

Yokota (35N, 140E) to 1 (30N, 133E); Ferry
1 (30N, 133E) to 2 (27N, 133E); Wall
2 (27N, 133E) to 3 (27N, 140E); Ferry
3 (27N, 140E) to 4 (30N, 140E); Wall
4 (30N, 140E) to Yokota (35N, 140E); Ferry

DC-8 Legs

Yokota (35N, 140E) to 5 (28N, 140E); Ferry
5 (28N, 140E) to 6 (28N, 133E); Lidar Support
6 (28N, 133E) to 7 (35N, 125E); Ferry
7 (35N, 125E) to 8 (28N, 125E); Extended Wall
7 (35N, 125E) to Yokota (35N, 140E); Ferry



Mar 25: P-3 flight 17 and DC-8 flight 15, Yokota local 3

Title: European outflow (DC-8), sunrise (P-3)

Duration: 7 hours (P-3), 10 hours (DC-8)

Description: The DC-8 will conduct an extended wall to 55N to sample European outflow. The P-3 will examine the photochemical evolution of the lower troposphere across sunrise.

P-3B Legs

Yokota (35N, 140E) to 1 (27N, 140E); Ferry

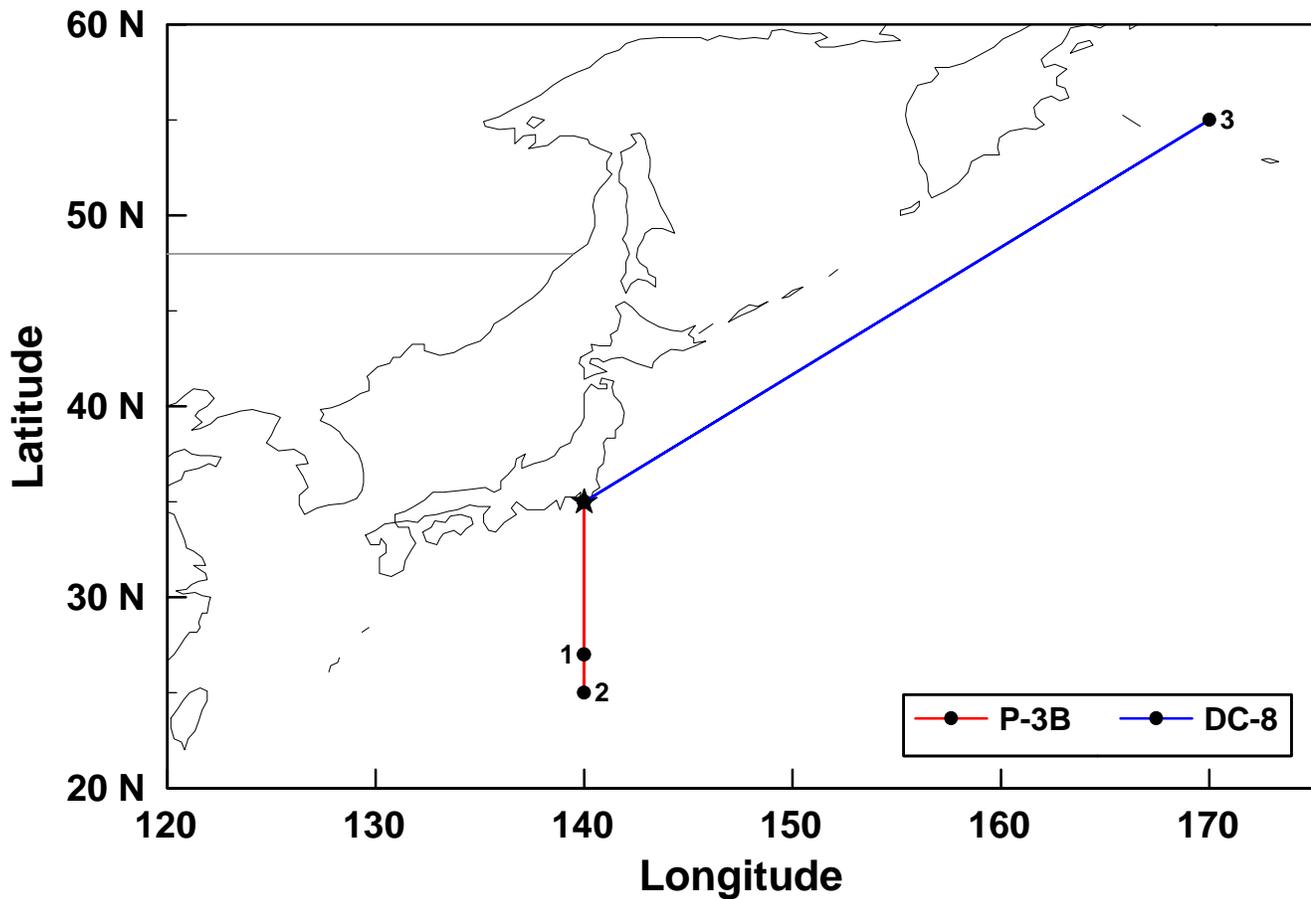
1 (27N, 140E) to 2 (25N, 140E); Wall

1 (27N, 140E) to Yokota (35N, 140E); Ferry

DC-8 Legs

Yokota (35N, 140E) to 3 (55N, 170E);

Extended Wall



Mar 28: P-3 flight 18 and DC-8 flight 16, Yokota local 4

Title: Stratospheric intrusions (DC-8), boundary layer outflow (P-3)

Duration: 8 hours (P-3), 8 hours (DC-8)

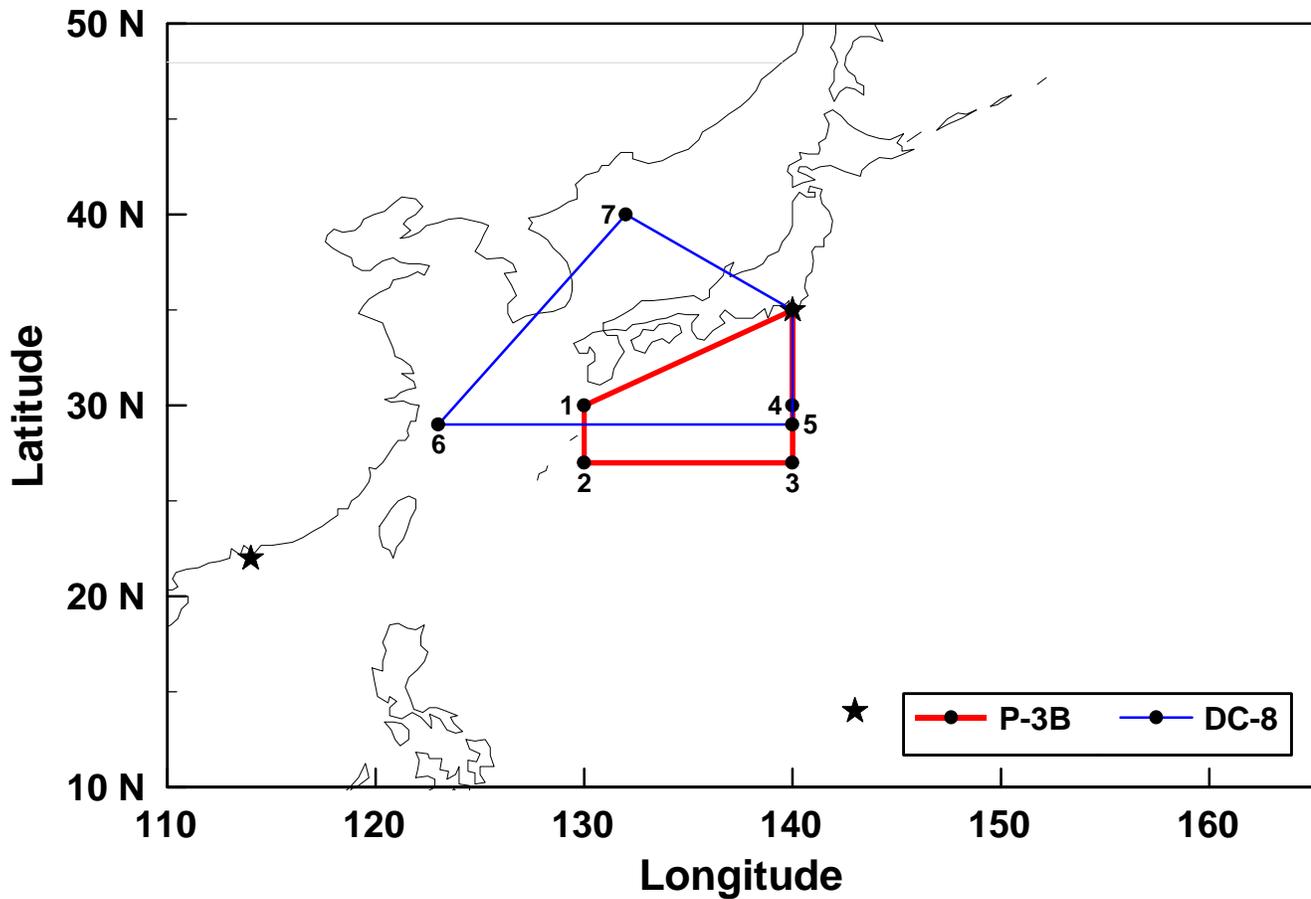
Description: The P-3 will examine the chemical aging of boundary layer outflow from China in coordination with ACE-Asia. The DC-8 will provide lidar support and will target stratospheric intrusions and continental outflow at high altitudes.

P-3B Legs

Yokota (35N, 140E) to 1 (30N, 130E); Ferry
1 (30N, 130E) to 2 (27N, 130E); Wall
2 (27N, 130E) to 3 (27N, 140E); Ferry
3 (27N, 140E) to 4 (30N, 140E); Wall
4 (30N, 140E) to Yokota (35N, 140E); Ferry

DC-8 Legs

Yokota (35N, 140E) to 5 (29N, 140E); Ferry
5 (29N, 140E) to 6 (29N, 123E); Lidar Support
6 (29N, 123E) to 7 (40N, 132E); In-Progress Wall
7 (40N, 132E) to Yokota (35N, 140E);
In-Progress Wall



Apr 1: P-3 flight 19 and DC-8 flight 17, Yokota local 5

Title: Dust outflow

Duration: 6 hours (P-3), 8 hours (DC-8)

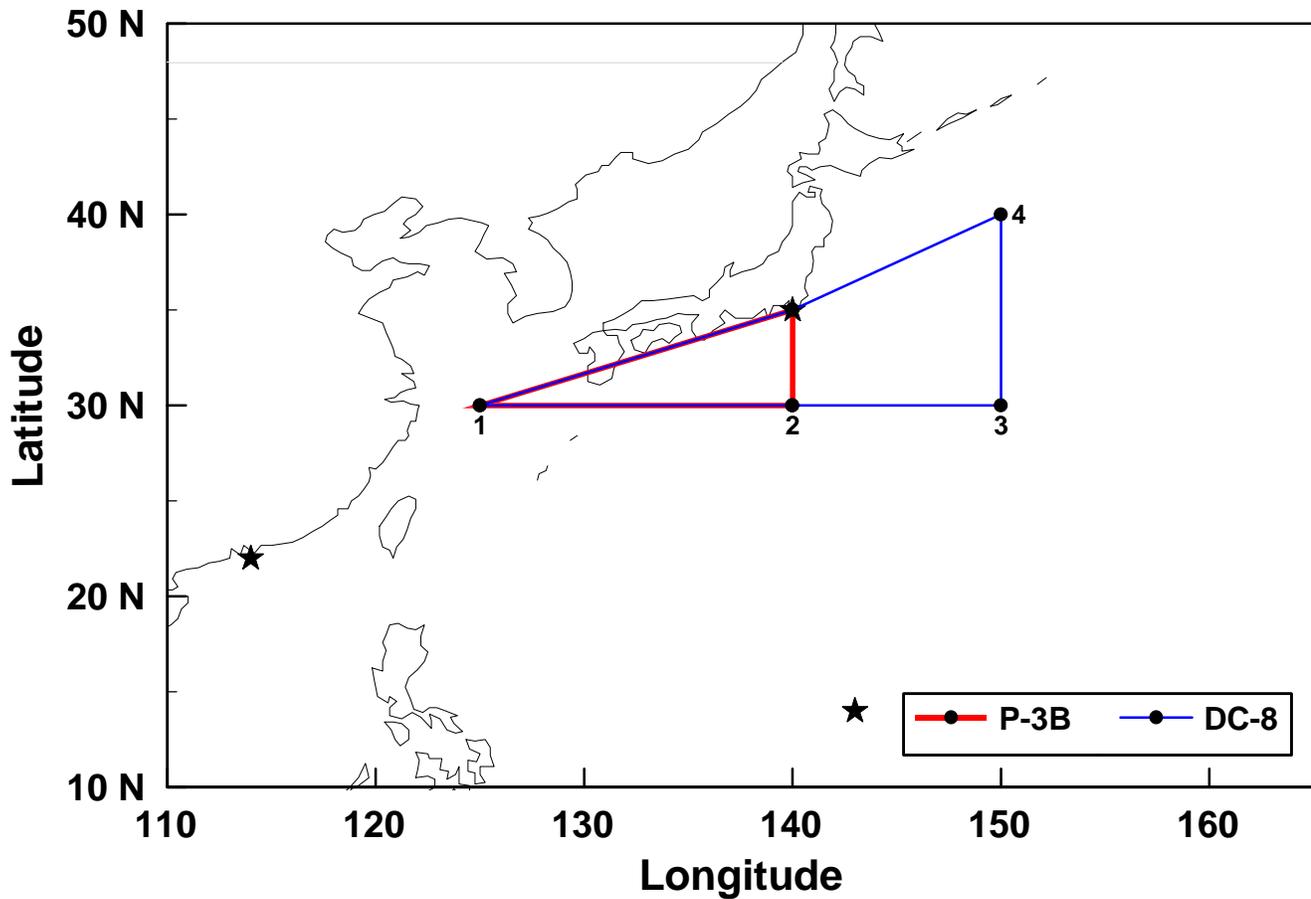
Description: The two aircraft will focus on sampling Asian dust outflow over a range of distances from the coast, in coordination with ACE-Asia

P-3B Legs

Yokota (35N, 140E) to 1 (30N, 125E); Ferry
1 (30N, 125E) to 2 (30N, 140E); In-Progress Wall
2 (30N, 140E) to Yokota (35N, 140E); Ferry

DC-8 Legs

Yokota (35N, 140E) to 1 (30N, 125E); Ferry
1 (30N, 125E) to 2 (30N, 140E); Lidar Support
2 (30N, 140E) to 3 (30N, 150E); Ferry
3 (30N, 150E) to 4 (40N, 150E); Wall
4 (40N, 150E) to Yokota (35N, 140E); Ferry



Apr 4: P-3 flight 20 and DC-8 flight 18, Yokota-Midway

Title: Transport and subsidence over W Pacific

Duration: 8 hours (P-3), 8 hours (DC-8)

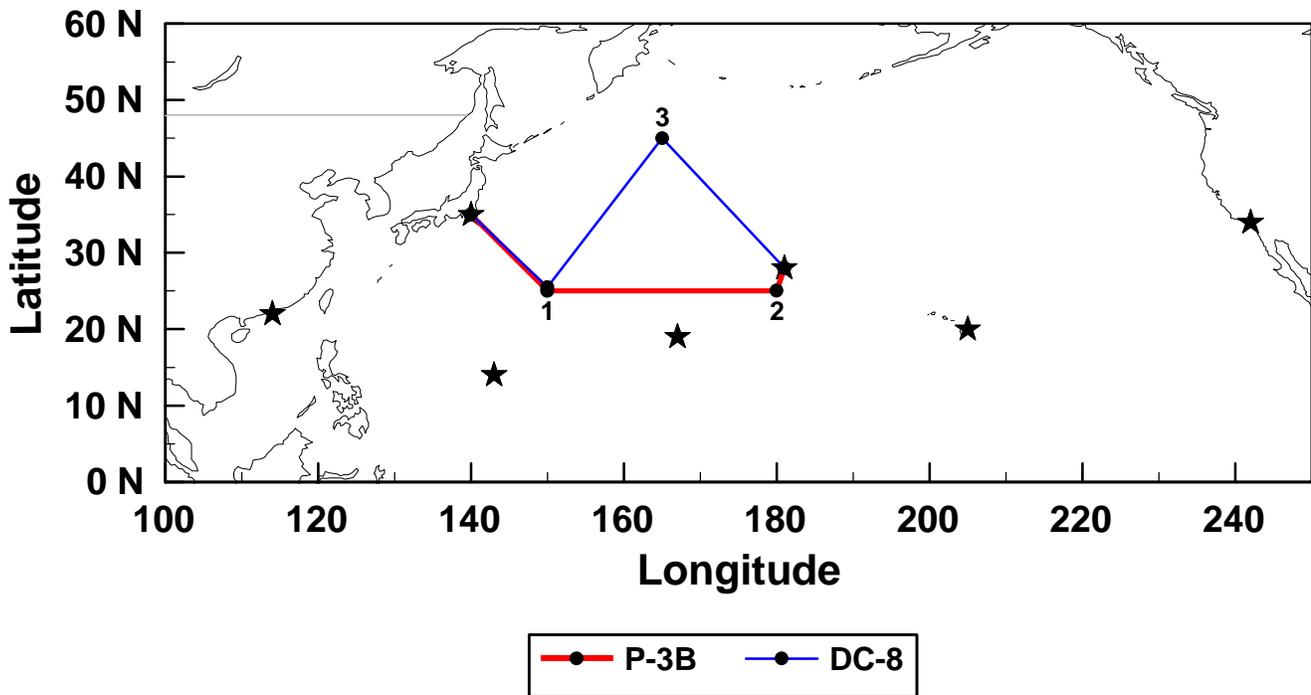
Description: The two aircraft will examine the chemical aging of Asian outflow during transport over the West Pacific. The P-3 will focus on subsiding subtropical air masses and the DC-8 will sample westerly flow to the north.

P-3B Legs

Yokota (35N, 140E) to 1 (25N, 150E); Ferry
1 (25N, 150E) to 2 (25N, 180E); In-Progress Wall
2 (25N, 180E) to Midway (28N, 179W); Ferry

DC-8 Legs

Yokota (35N, 140E) to 1 (25N, 150E); Ferry
1 (25N, 150E) to 3 (45N, 165E); In-Progress Wall
2 (25N, 180E) to Midway (28N, 179W);
In-Progress Wall



Apr 5: P-3 flight 21 and DC-8 flight 19, Midway local

Title: Dateline transect

Duration: 8 hours (P-3), 6 hours (DC-8)

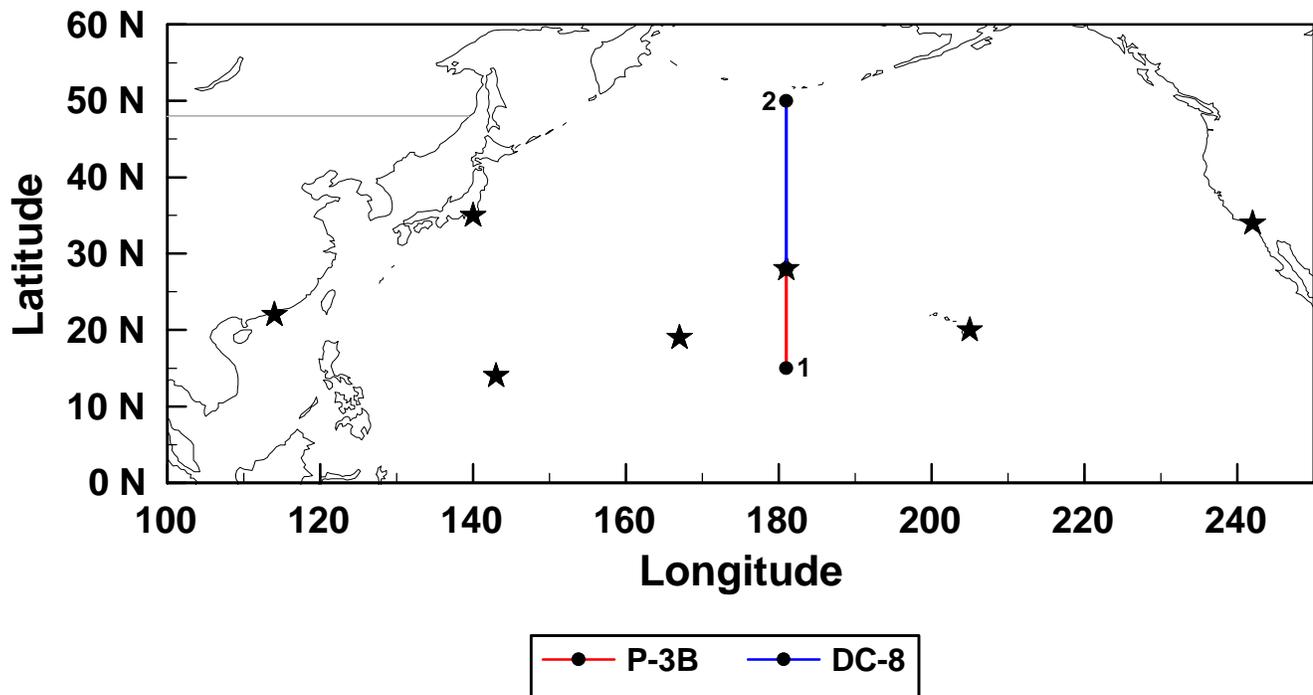
Description: The two aircraft will conduct extended walls to obtain a latitude-altitude transect at the dateline.

P-3B Legs

Midway (28N, 179W) to 1 (15N, 179W);
Extended Wall

DC-8 Legs

Midway (28N, 179W) to 2 (50N, 179W);
Extended Wall



Apr 7: P-3 flight 22 and DC-8 flight 20, Midway-Hilo

Title: Asian outflow over central Pacific

Duration: 5 hours (P-3), 6 hours (DC-8)

Description: The two aircraft will sample aged Asian plumes over the central Pacific during transit from Midway to Hilo.

P-3B Legs

Midway (28N, 179W) to 1 (15N, 165W);

In-Progress Wall

1 (15N, 165W) to Hilo (20N, 155W);

In-Progress Wall

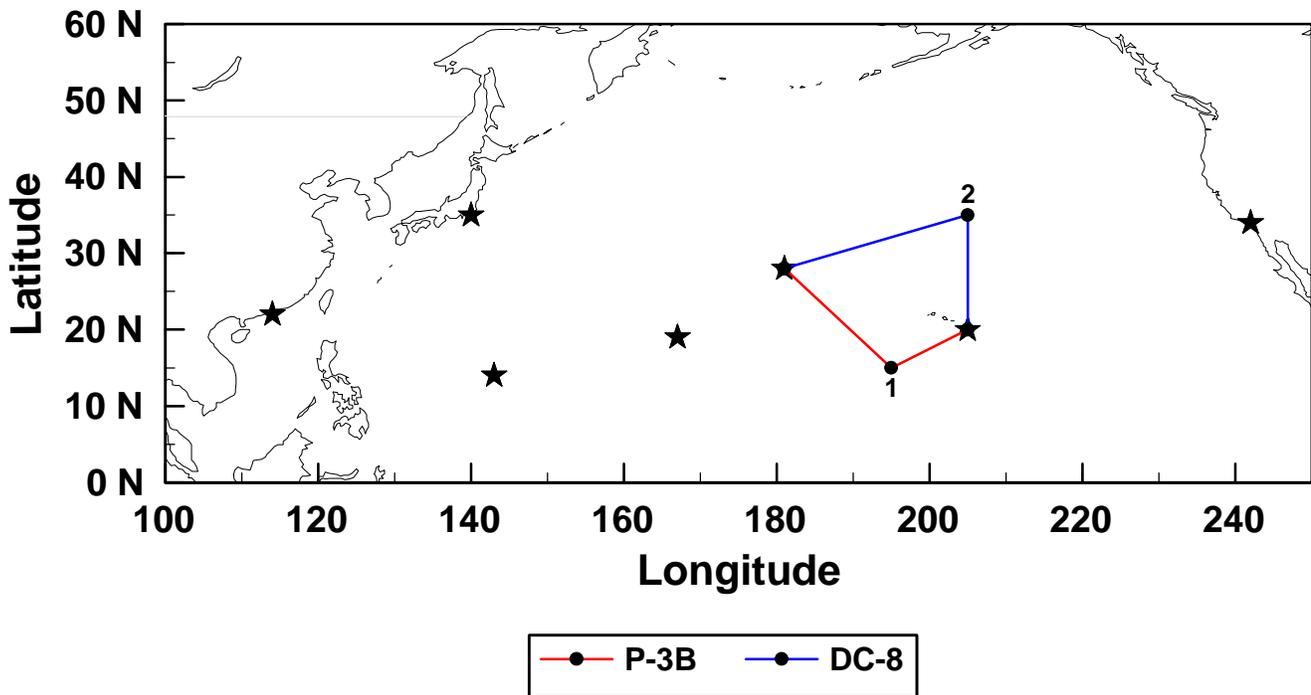
DC-8 Legs

Midway (28N, 179W) to 2 (35N, 155W);

In-Progress Wall

2 (35N, 155W) to Hilo (20N, 155W);

In-Progress Wall



Apr 8: P-3 flight 23 and DC-8 flight 21, Hilo-Dryden

Title: Asian outflow over E Pacific

Duration: 7 hours (P-3), 8 hours (DC-8)

Description: The two aircraft will target aged subsiding air masses over the eastern Pacific during transit from Hilo to Dryden.

P-3B Legs

Hilo (20N, 155W) to Dryden (34N, 118W);

In-Progress Wall

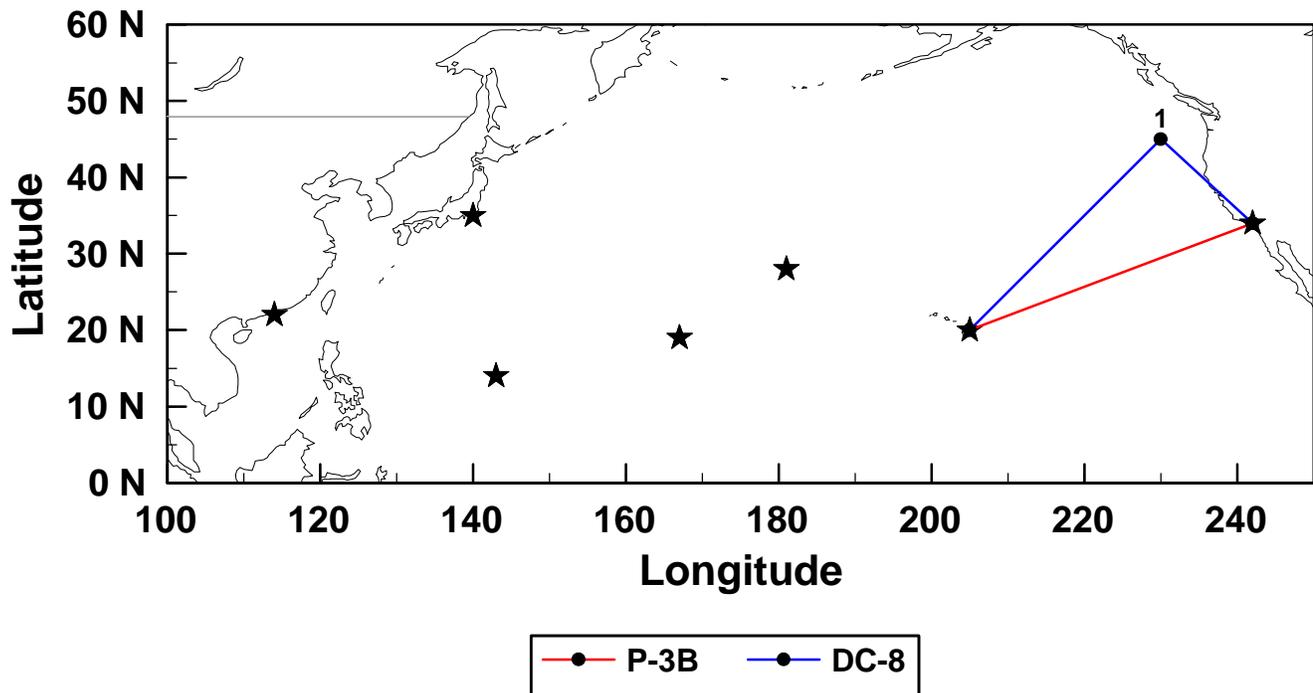
DC-8 Legs

Hilo (20N, 155W) to 1 (45N, 130W);

In-Progress Wall

1 (45N, 130W) to Dryden (34N, 118W);

In-Progress Wall



Apr 10: P-3 flight 24, Dryden-WFF

Title: Transit

Duration: 5.5 hours

Description: Straight transit.

P-3B Legs

Dryden (34N, 118W) to Wallops (37N, 76W); Ferry

NO MAP