CALIPSO

Adding the Vertical Dimension

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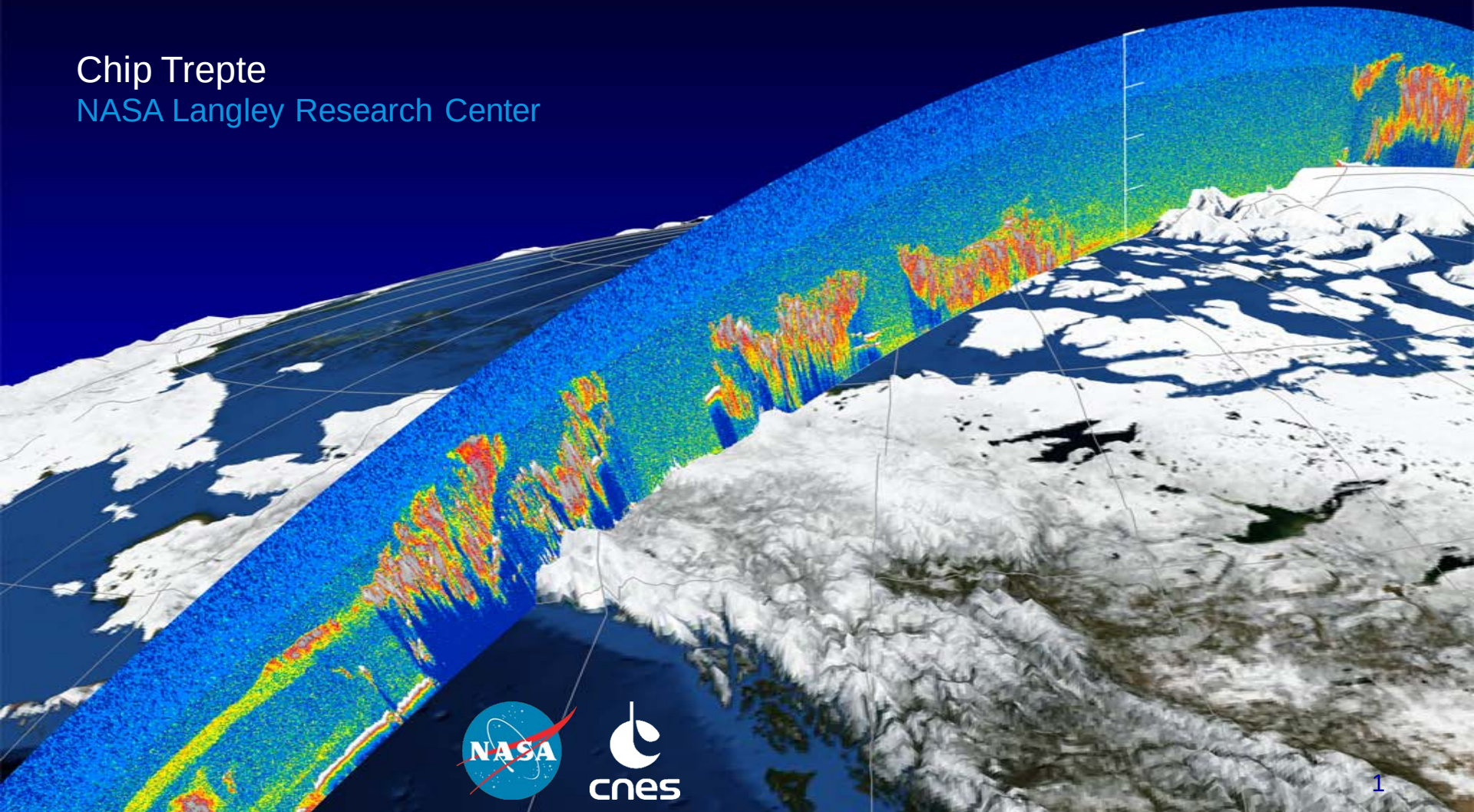


CALIPSO Background

Description

Objective: Improve understanding of the effects of aerosols & clouds on climate (launched April 28, 2006)

Measures: Profile observations of aerosols & clouds and their optical properties; flies in A-Train

Primary Instrument: 532/1064 nm lidar with depolarization channel at 532 nm

Applications

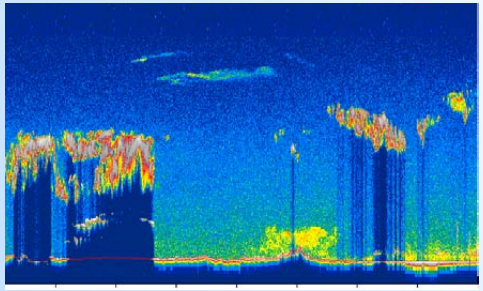
- Aerosol (PM) /cloud detection
- Layer heights (cloud, pollution, volcanic plumes, PBL)
- Retrieval development/verification
- Ocean sfc winds
- Model development/verification

Air Quality

Climate

Weather

Observations



Day/Night

100 m footprint

30-60 m vertical res.

333 m horizontal res.

16 day repeat cycle

Latency: entire dataset downlinked once each day

www-calipso.larc.nasa.gov

Data Products

Products:

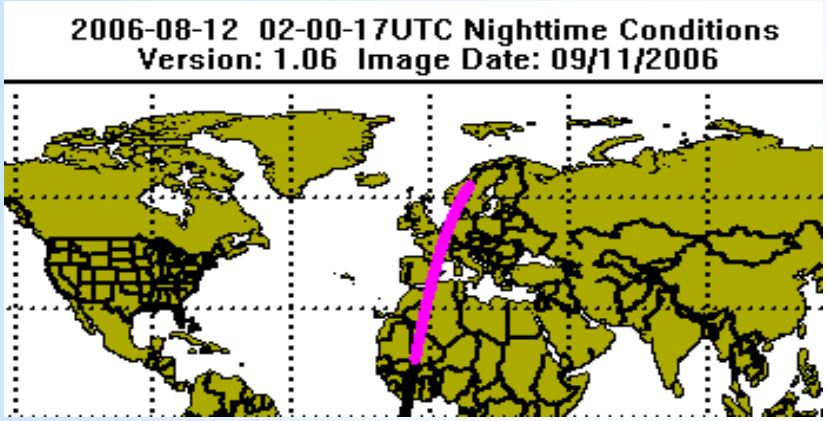
- Vertical aerosol/cloud feature mask
- Aerosol/cloud layer heights
- Aerosol typing; cloud ice/water phase
- Backscatter, extinction & depolarization profiles

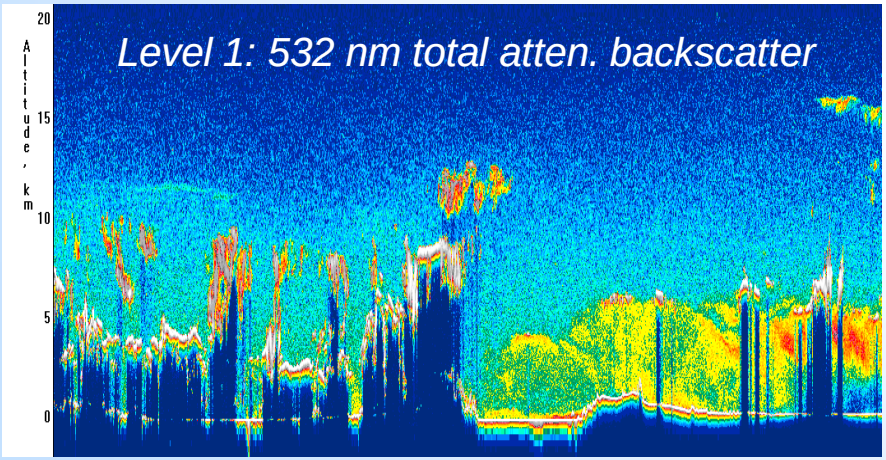
Processing Turnaround: ~3 days

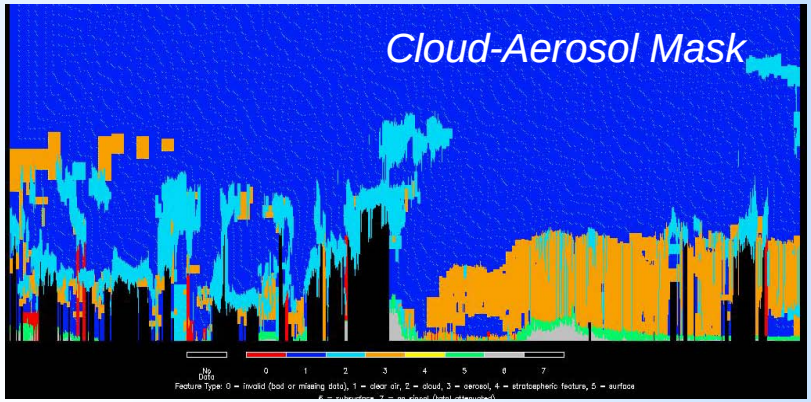
Quicklook Products: available ~15 GMT each day

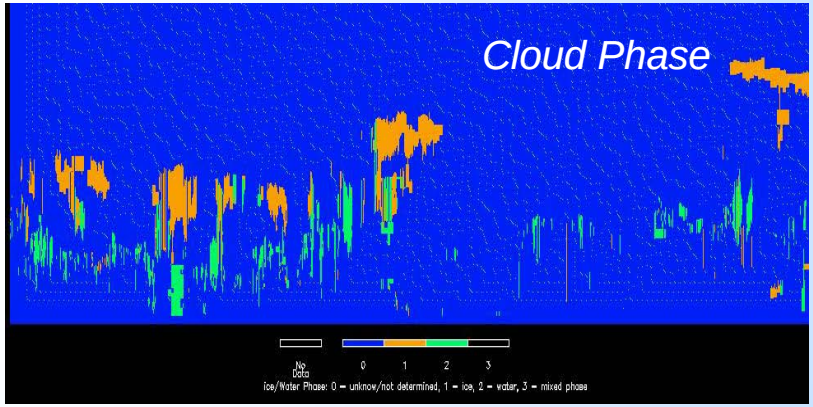
Data sub-setting tool available Spring 2010

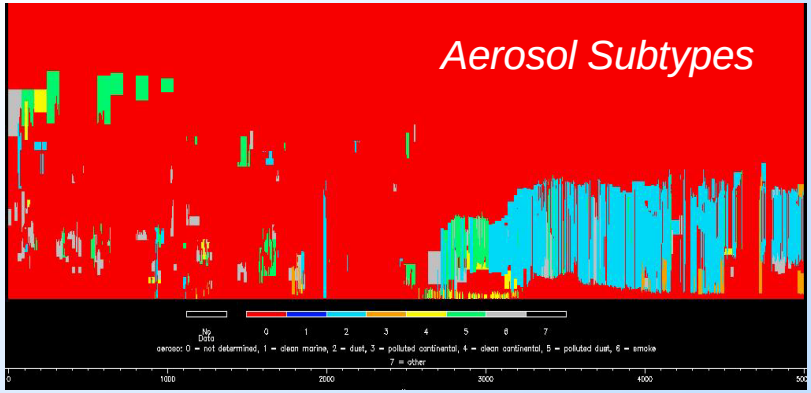
CALIPSO Data Products



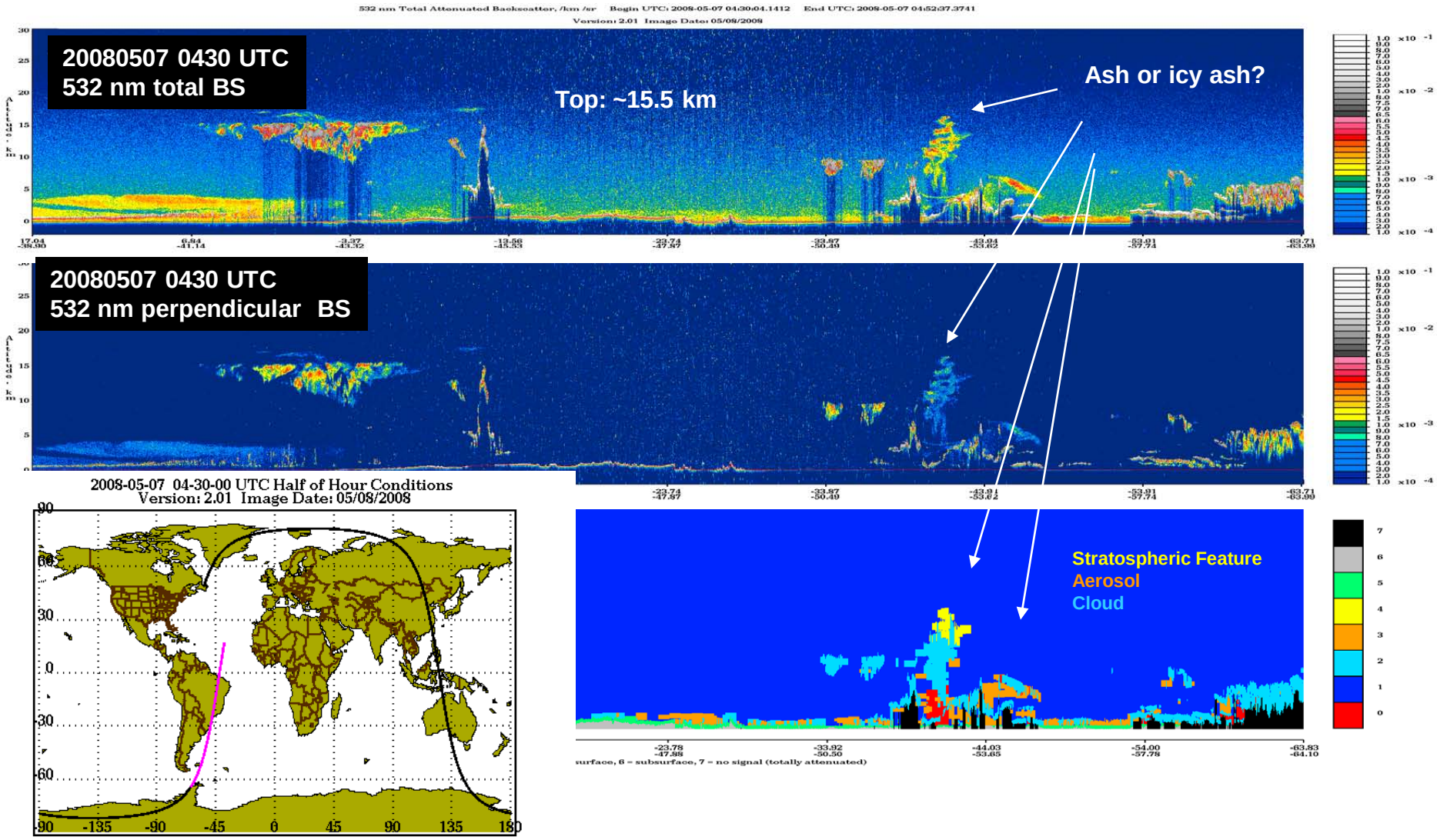








Chaiten Volcanic Plume seen by CALIPSO



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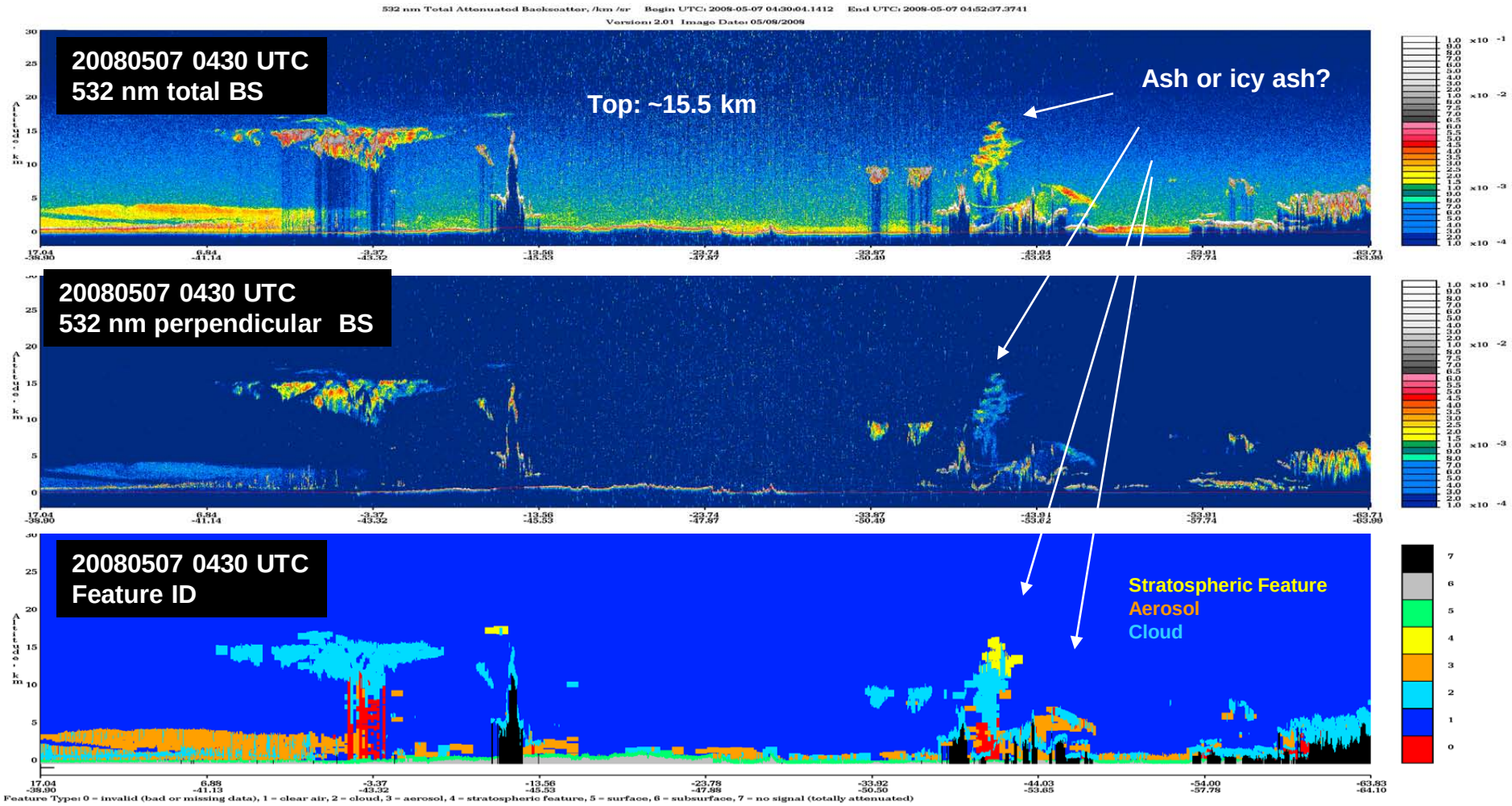
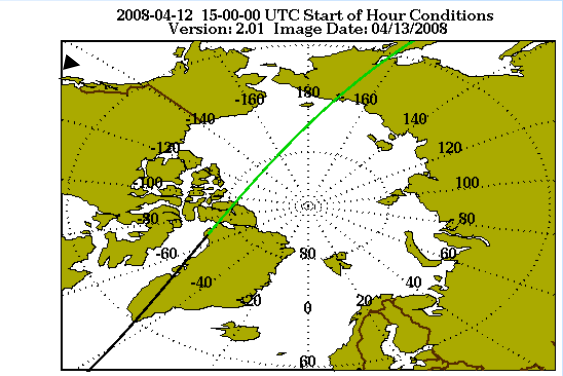
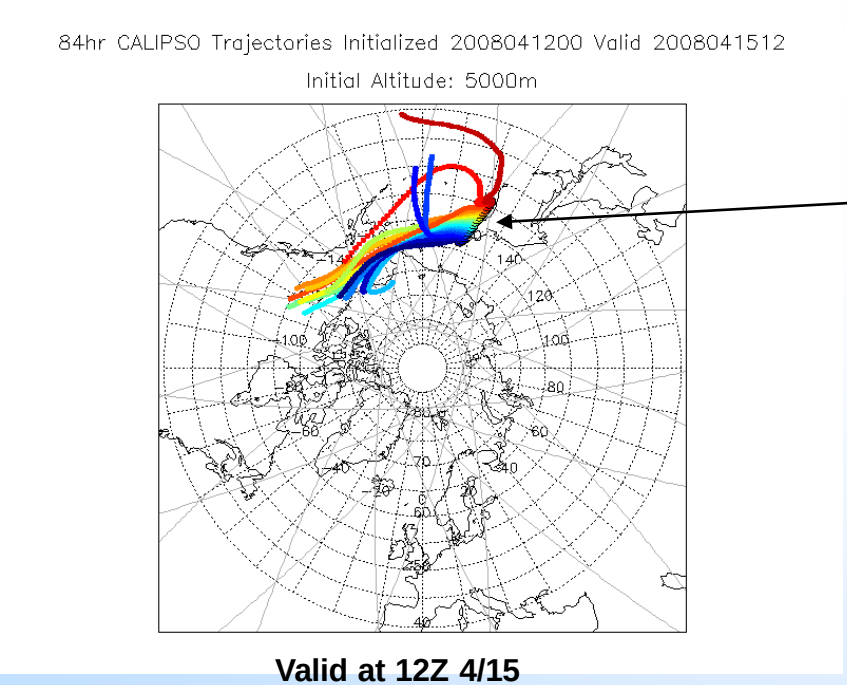


Smoke Plumes

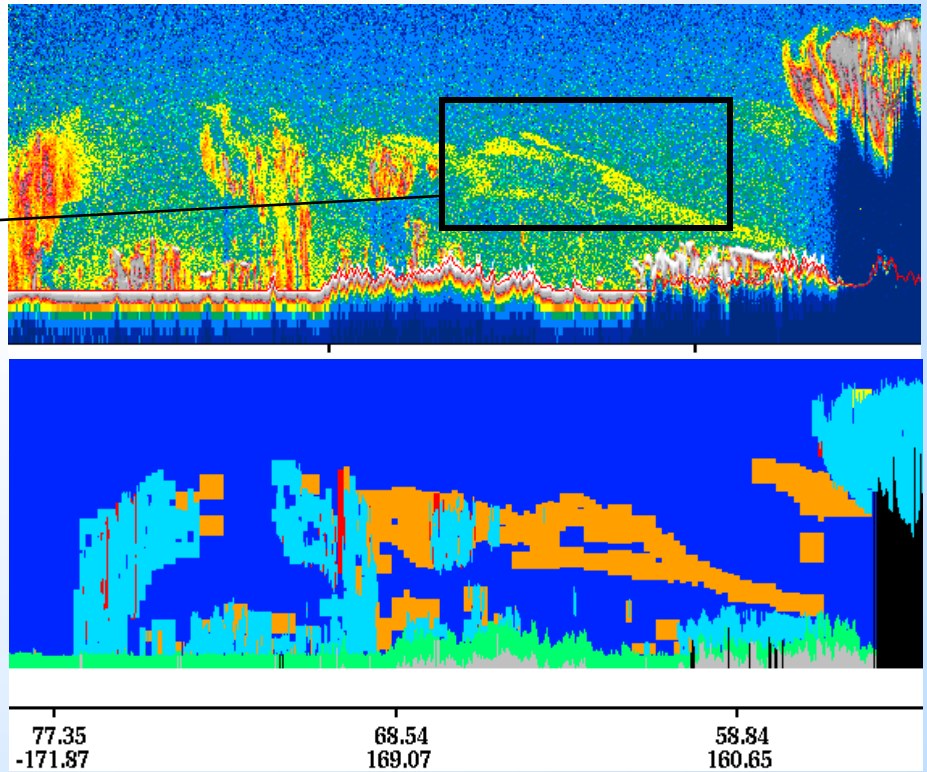
CALIPSO ‘Quicklook’ products verified a smoke plume forecasted by CTMs and aided flight planning

12 April 2008



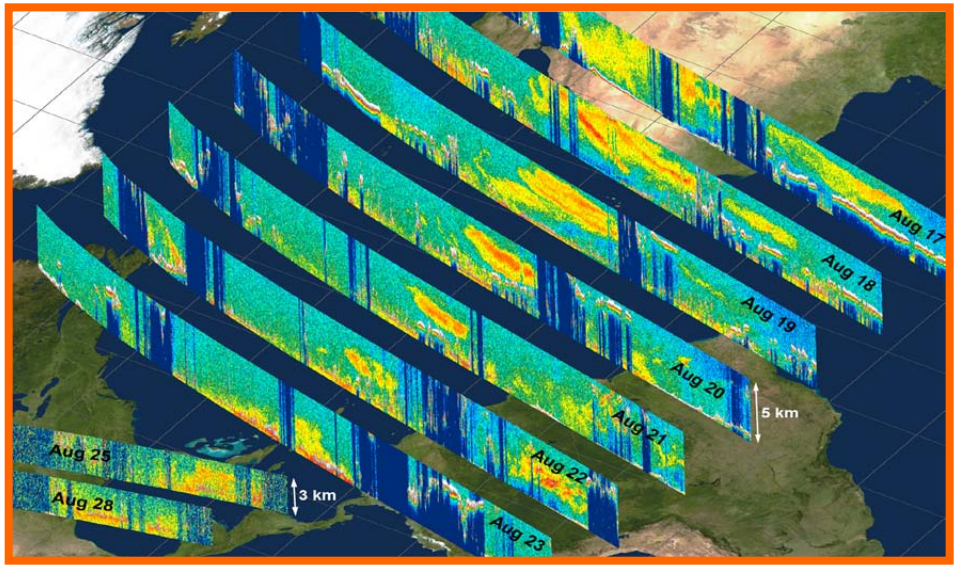
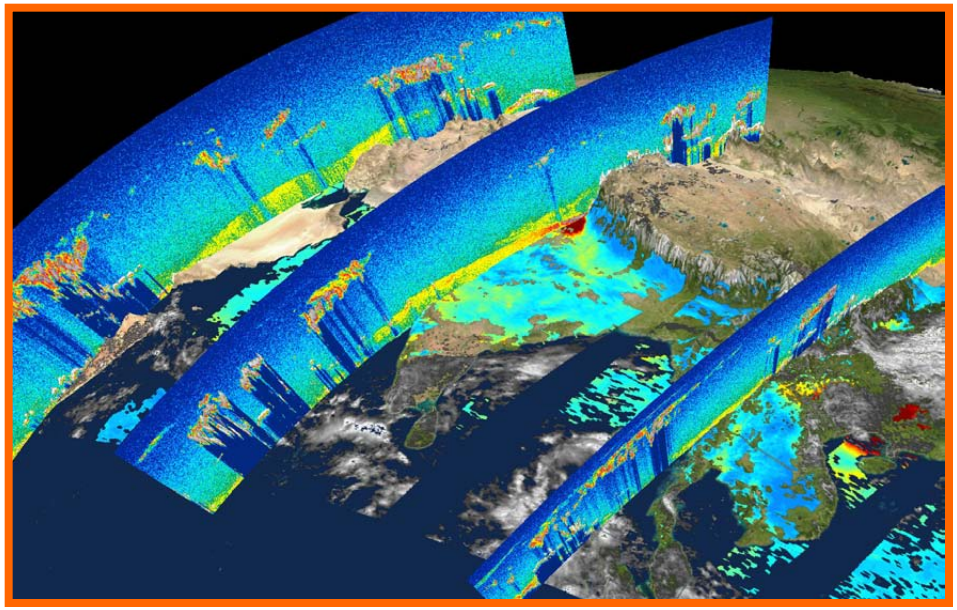


Valid at 12Z 4/15



Assimilation of CALIPSO Products

New techniques are being employed to ingest CALIPSO observations in support of air quality and hazard warning forecasts

Studies include

- model verification
- parameterization development
- data assimilation and fusion
- experimental forecast products
- skill assessment