

Overview of AVIRIS Acquisitions in Argentina as Part of the NM EO-1 Campaign in 2001

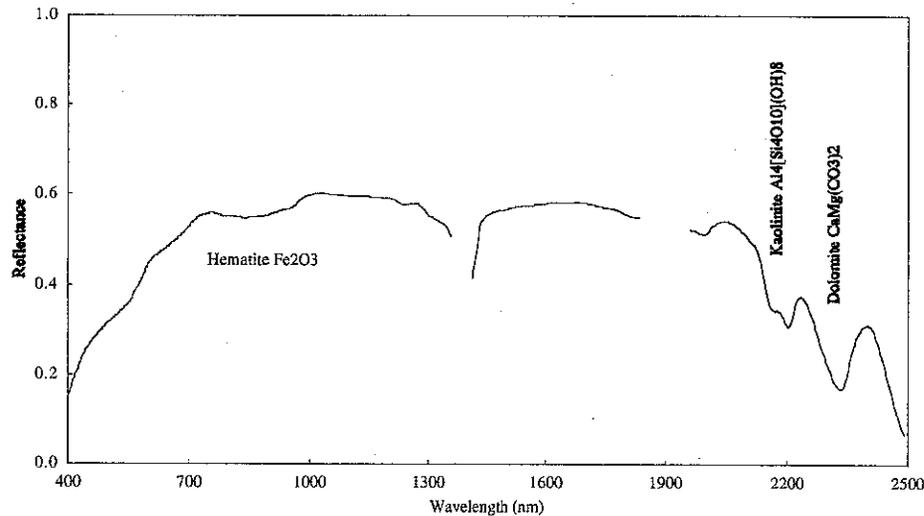
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Overview

- Imaging Spectroscopy Approach
- AVIRIS Instrument and Data
- Calibration and SNR
- Argentina Campaign
- Summary

AVIRIS: The Imaging Spectroscopy Approach

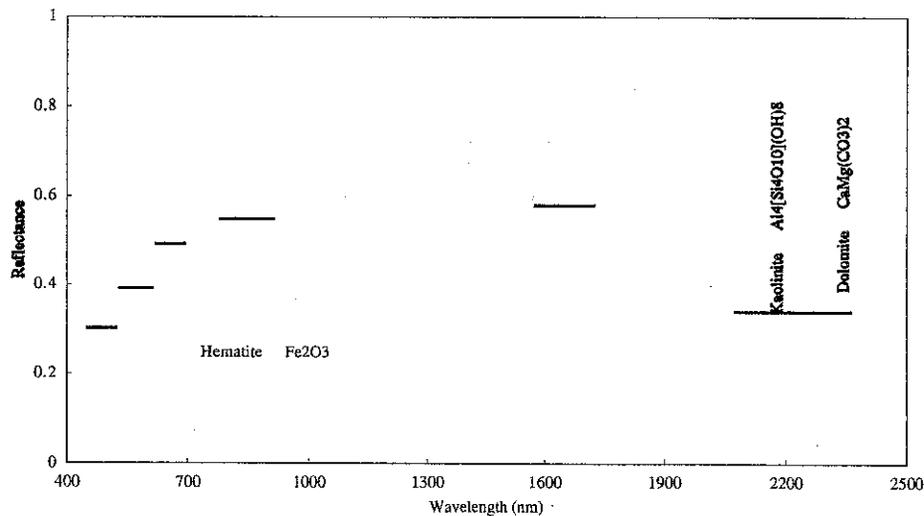


Spectroscopic Example

Three materials detected

Three materials identified

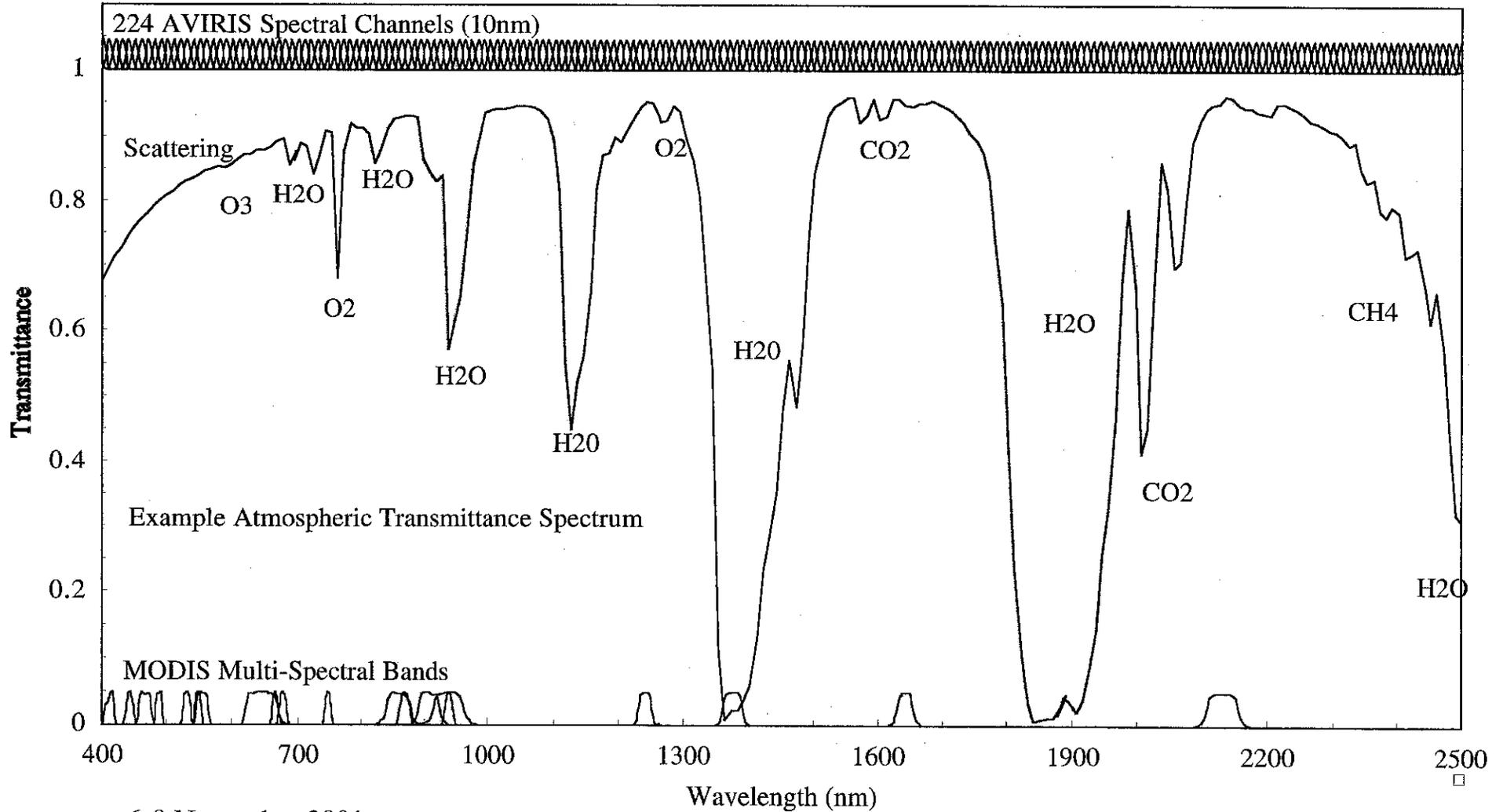
Expressed concentrations derived



Multi Spectral Example

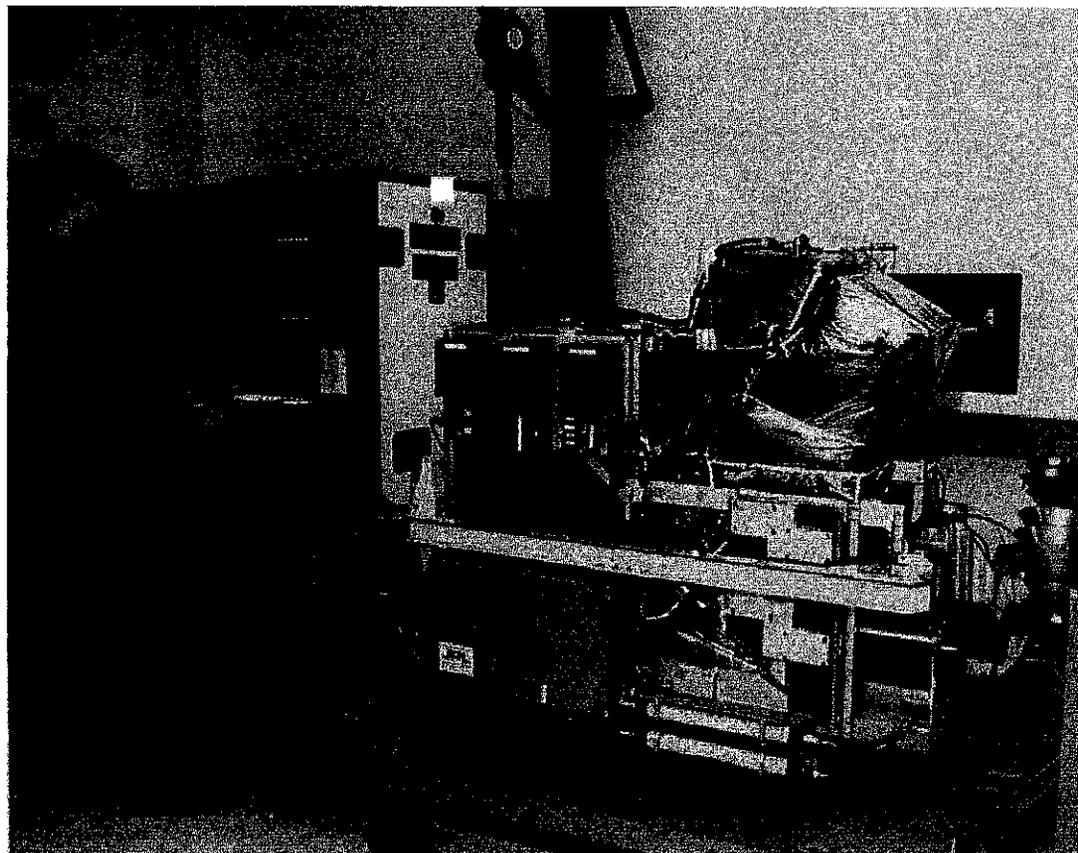
6-8 November 2001

AVIRIS Measurement of the Spectrum



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AVIRIS Instrument



AVIRIS Technology Status

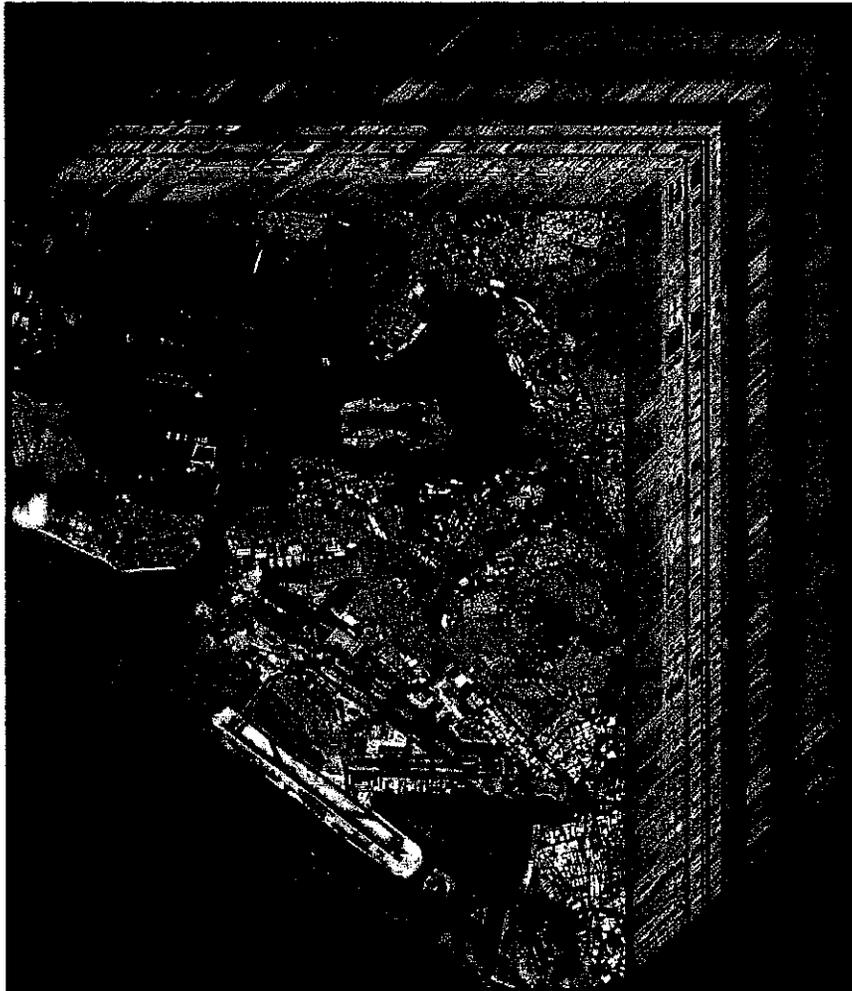
- Thermal control 1997
- Low Altitude 1998
- INU/GPS 1998
- Geo rectification 1998
- Onboard calibrator 1999
- Detector arrays 2000
- Digital signal chain 2001
- Onboard data storage 2001

AVIRIS is designed with $200\ \mu\text{m}$ detectors and F/1 optics.

It is hard to imagine larger detectors or faster optics.

The AVIRIS design is in the advanced technology zone of the physics of spectroscopic measurements

AVIRIS: PEARL HARBOR, HAWAII



Spectral

Range	370 to 2500
Sampling	9.8 nm
Accuracy	0.5 nm

Radiometric

Range	0 to Max Lambertian
Sampling	12 bits
Accuracy	96 percent

Spatial (ER-2 / Twin Otter aircraft)

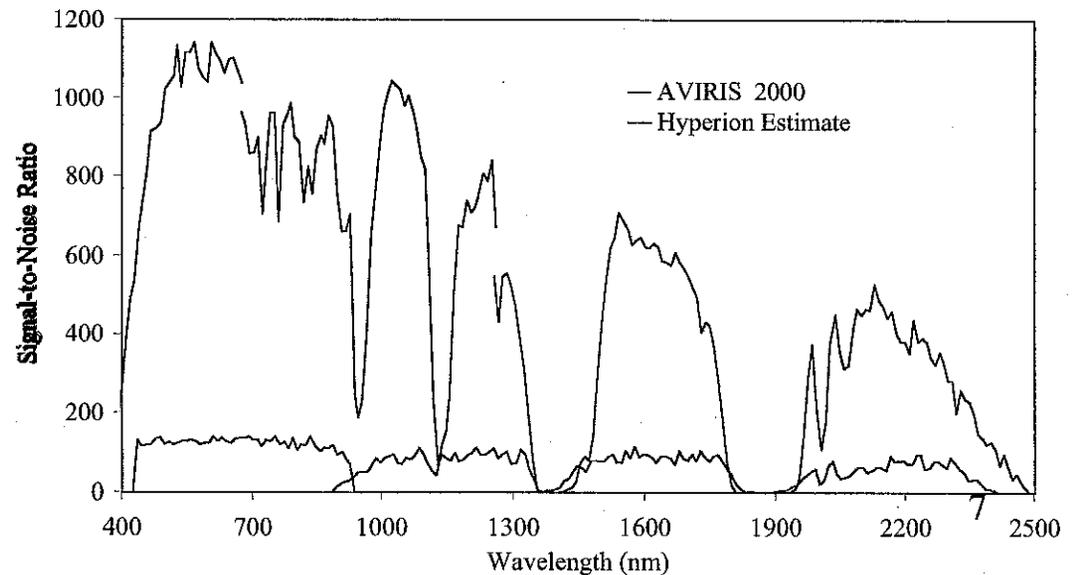
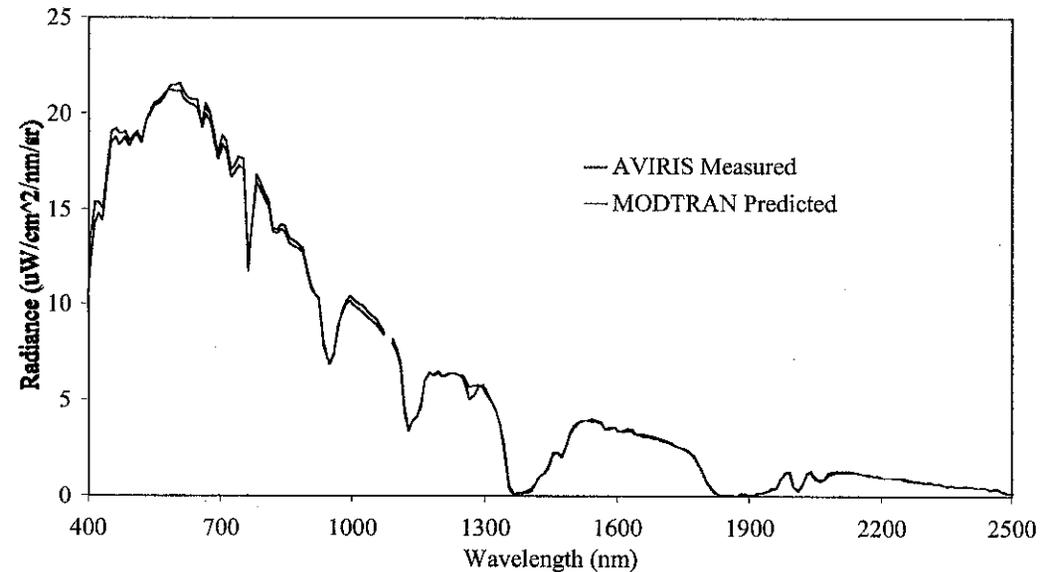
Swath	11/2.2 km ER-2/TO
Sampling	20/4 m ER-2/TO
Accuracy	20/4 m ER-2/TO

Full INU/GPS geo rectification

AVIRIS Performance

Excellent calibration and high precision (SNR) are required for NASA Code Y science

- AVIRIS calibration is within 96% of an independent prediction
- AVIRIS SNR ranges from 1000 to 500 in the continuum regions of the spectrum



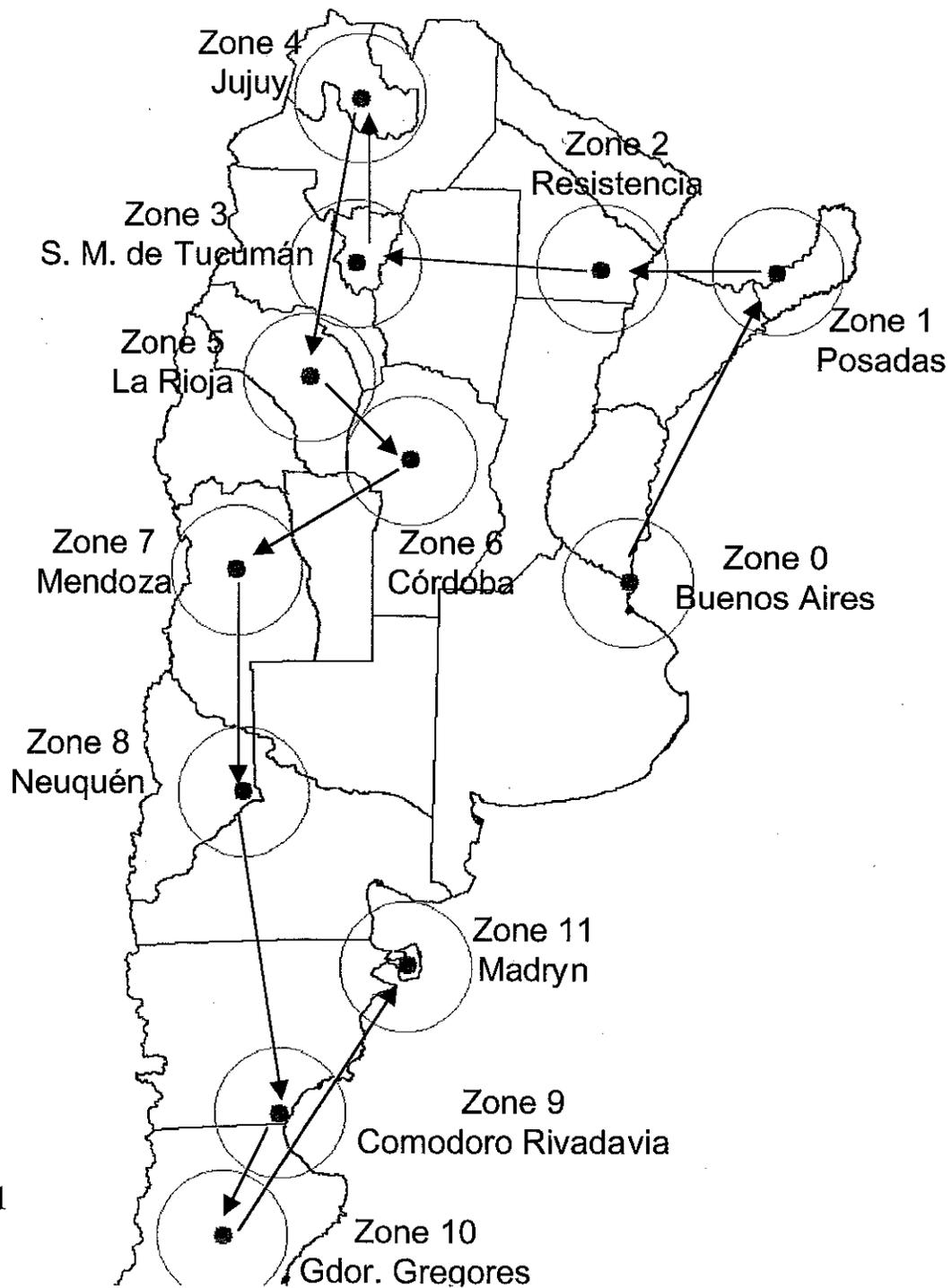
Argentina 2001

- In September/October 2000 it was proposed that AVIRIS deploy to Argentina in January to support NM EO-1 with summer underflight and validation acquisitions.
- On the 30th of December 2000 the Twin Otter left Las Vegas headed for Buenos Aires at 140 knots
- On the 3rd of January 2001 AVIRIS was shipped to Buenos Aires
- On the 13th of January AVIRIS collected the first image in Argentina onboard the Twin Otter

Argentina 2001 First Image January 13th



6-8 November 2001



6-8 November 2001

AVIRIS Argentina 2001

- AVIRIS began imaging on the 13 of January
- AVIRIS finished on the 20th of February
- AVIRIS flew 25 days and collected more than 125 flight lines
- More than 216 gigabytes of data were measured
- Two simultaneous under flights of NM EO-1
- Two simultaneous under flights of SAC-C
- The data have been calibrated and delivered investigators