

A detailed military map with a circular protractor overlay. The map features various colored lines representing roads, rivers, and boundaries. A circular protractor with a grid is placed over the map, and a small metal fastener is visible in the center. The word "WELCOME" is prominently displayed in the center of the map.

WELCOME

Capt. Yuri Yomel Estrada Magaña

A PILOT PERSPECTIVE ON VOLCANIC ASH

International Federation of Air Line Pilots' Associations




IFALPA

The Global Voice of Pilots

A photograph of an Aeromexico Boeing 777-300ER in flight against a clear blue sky. The aircraft is white with blue and red accents, including the Aeromexico logo and the Mexican flag. The landing gear is deployed. The text "Smoky aerosol, Volcanic ash... of what origin ?" is overlaid in large, bold, black font across the center of the image.

**Smoky aerosol, Volcanic
ash... of what origin ?**

A photograph of an Aeromexico Boeing 777-300ER in flight against a clear blue sky. The aircraft is white with blue and red accents, including the Aeromexico logo on the tail. The text is overlaid on the image.

The nexts slides contains pictures taken during flights that had officially uncontaminated air, or air that had a 'low' level of volcanic ash contamination.

A white Aeroflot airplane is shown from a low angle, flying towards the left. The aircraft has blue accents on the tail and engines. The word "AEROFLOT" is visible on the side of the fuselage. The background is a clear, bright blue sky.

**However, the airspace contained
.... something.**

**Some aerosol, fine particles:
smoke, fumes – whatever.**

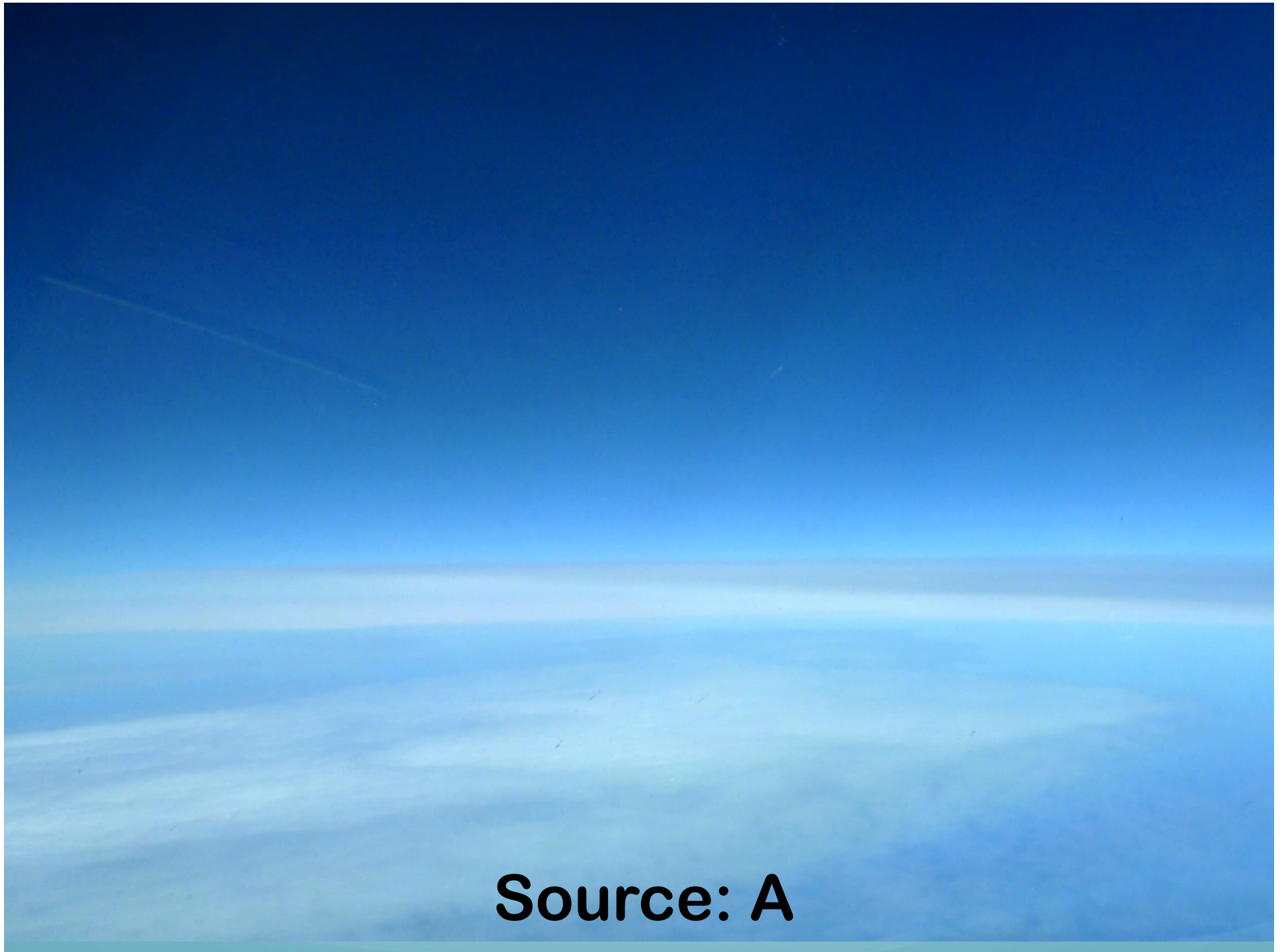
**The ‘something’ was put into the
air by 4 sources.**

The Sources are named “A, B, C, D”

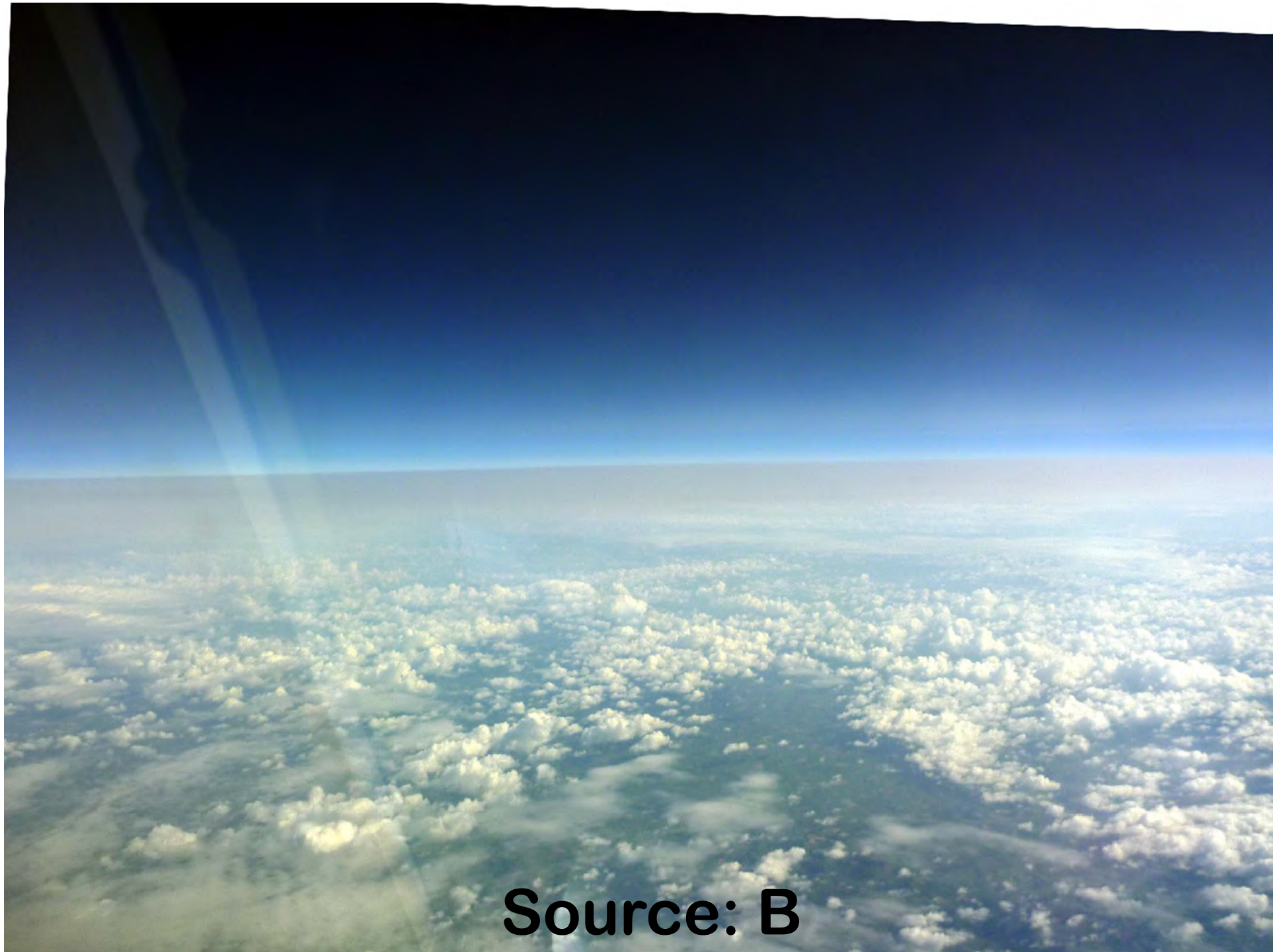
An Aeromexico airplane is shown in flight, angled upwards from the bottom left towards the top right. The aircraft is white with blue and red accents, including the Aeromexico logo on the tail. The background is a clear blue sky. Overlaid on the image is text in a bold, black, sans-serif font.

**Three of the sources are volcanos –
the fourth source of the
‘something’ were forest fires.**

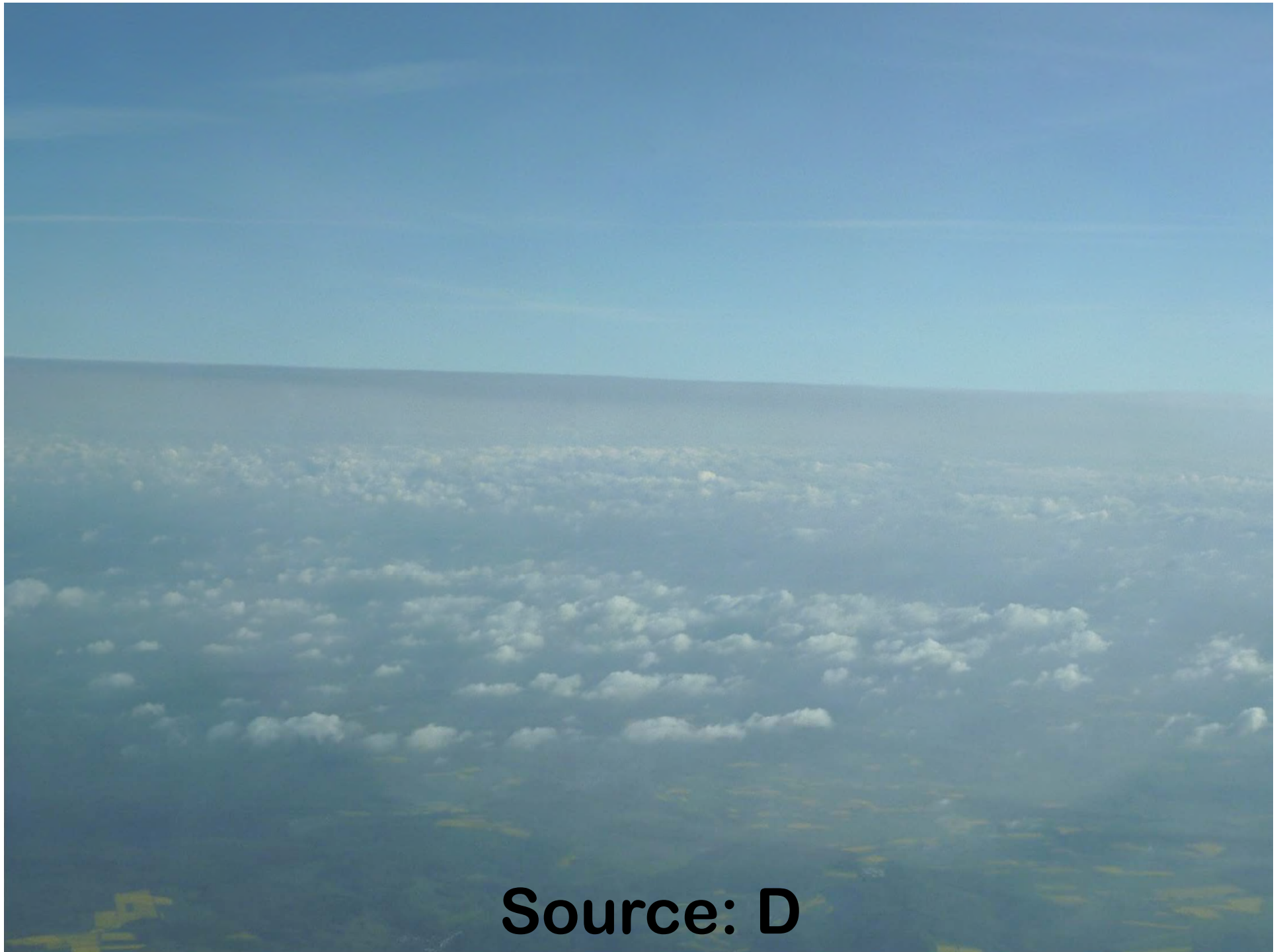
**Try to find out which pictures show
‘something’ of organic origin,
smoke from forest fires: A, B, C or D.**



Source: A



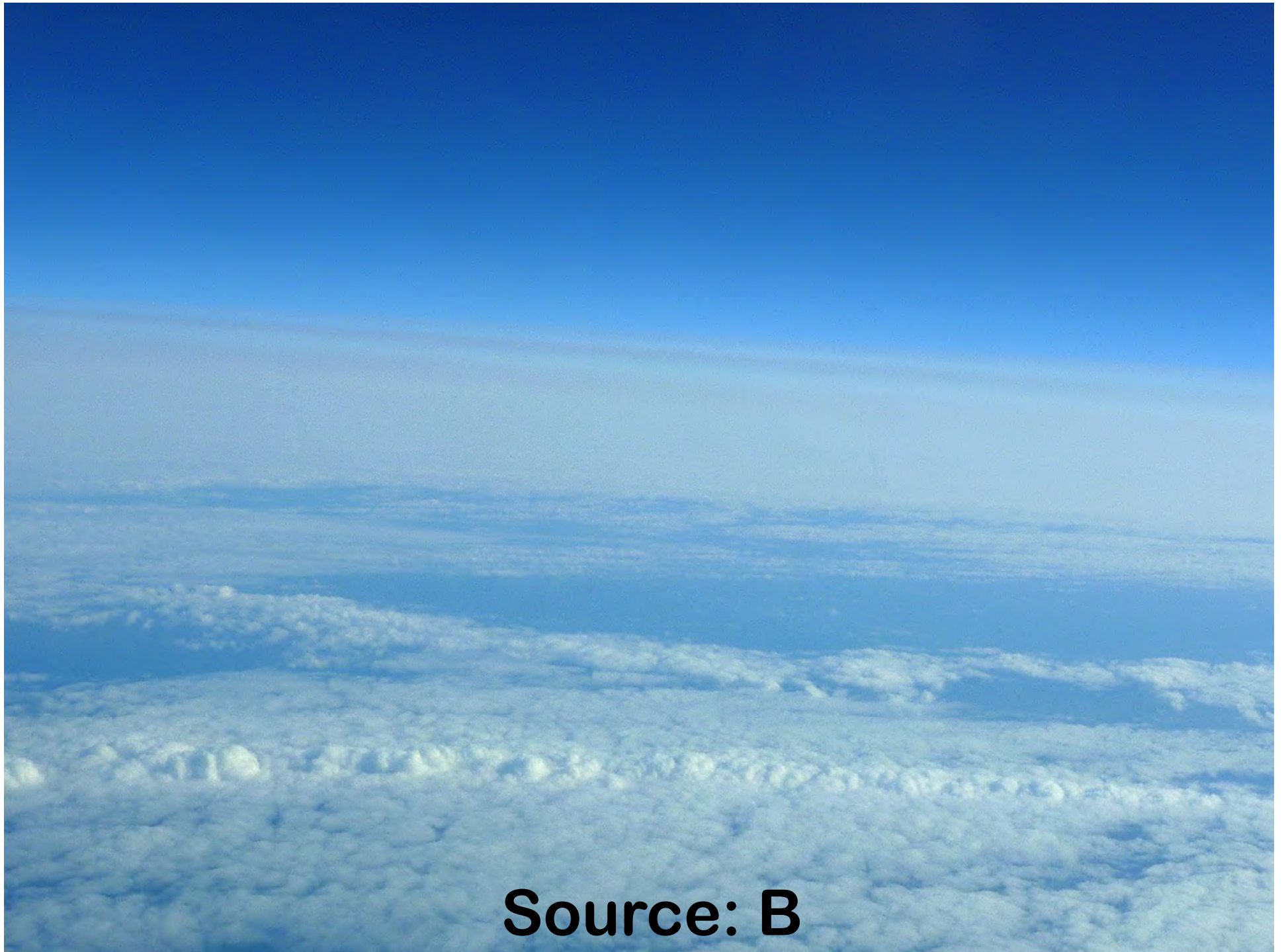
Source: B



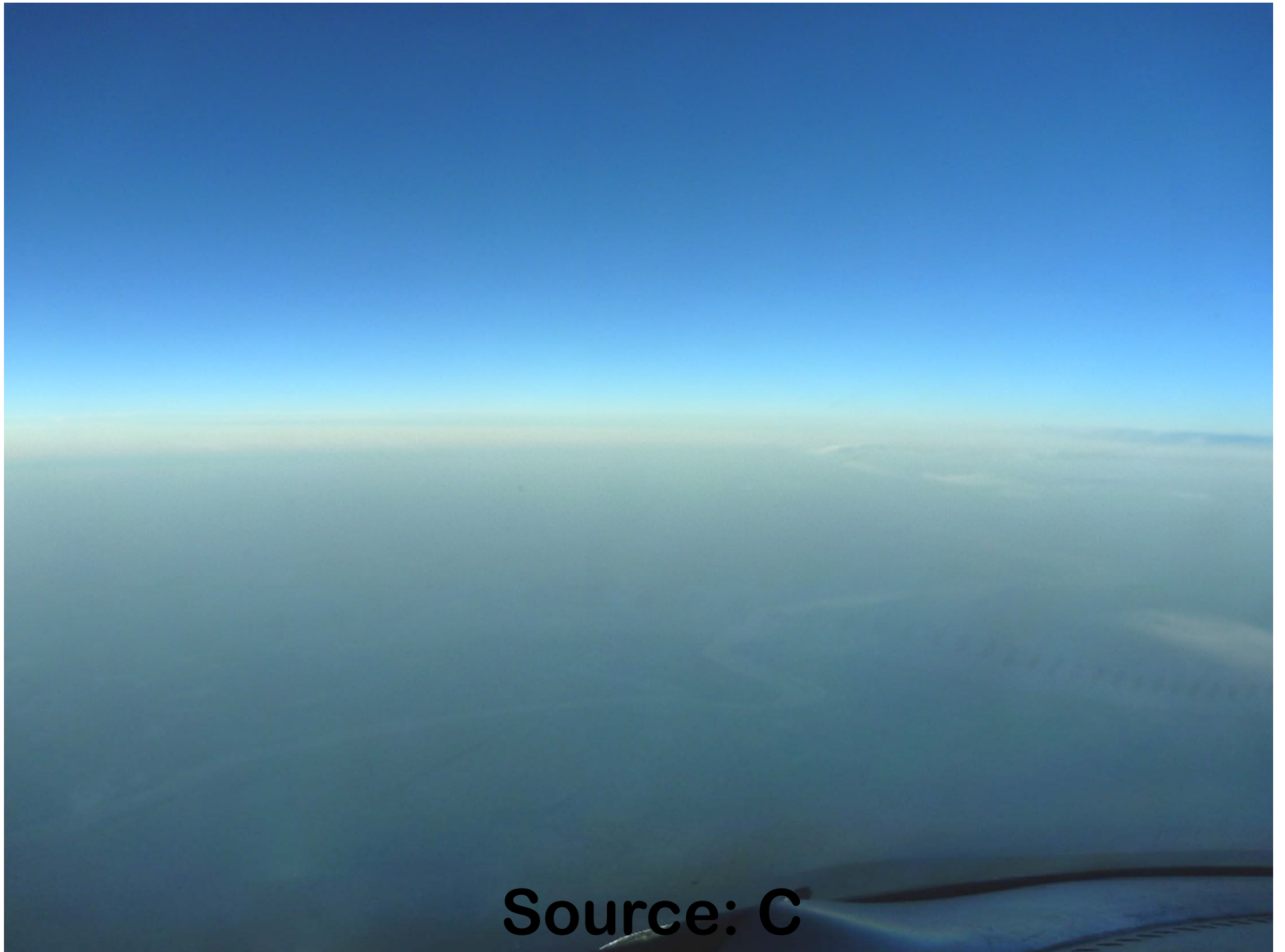
Source: D

An aerial photograph of a coastline, showing a dark blue sea on the left and a lighter blue, hazy land area on the right. The image is framed by a blue gradient border. The text "Source: A" is located at the bottom center.

Source: A

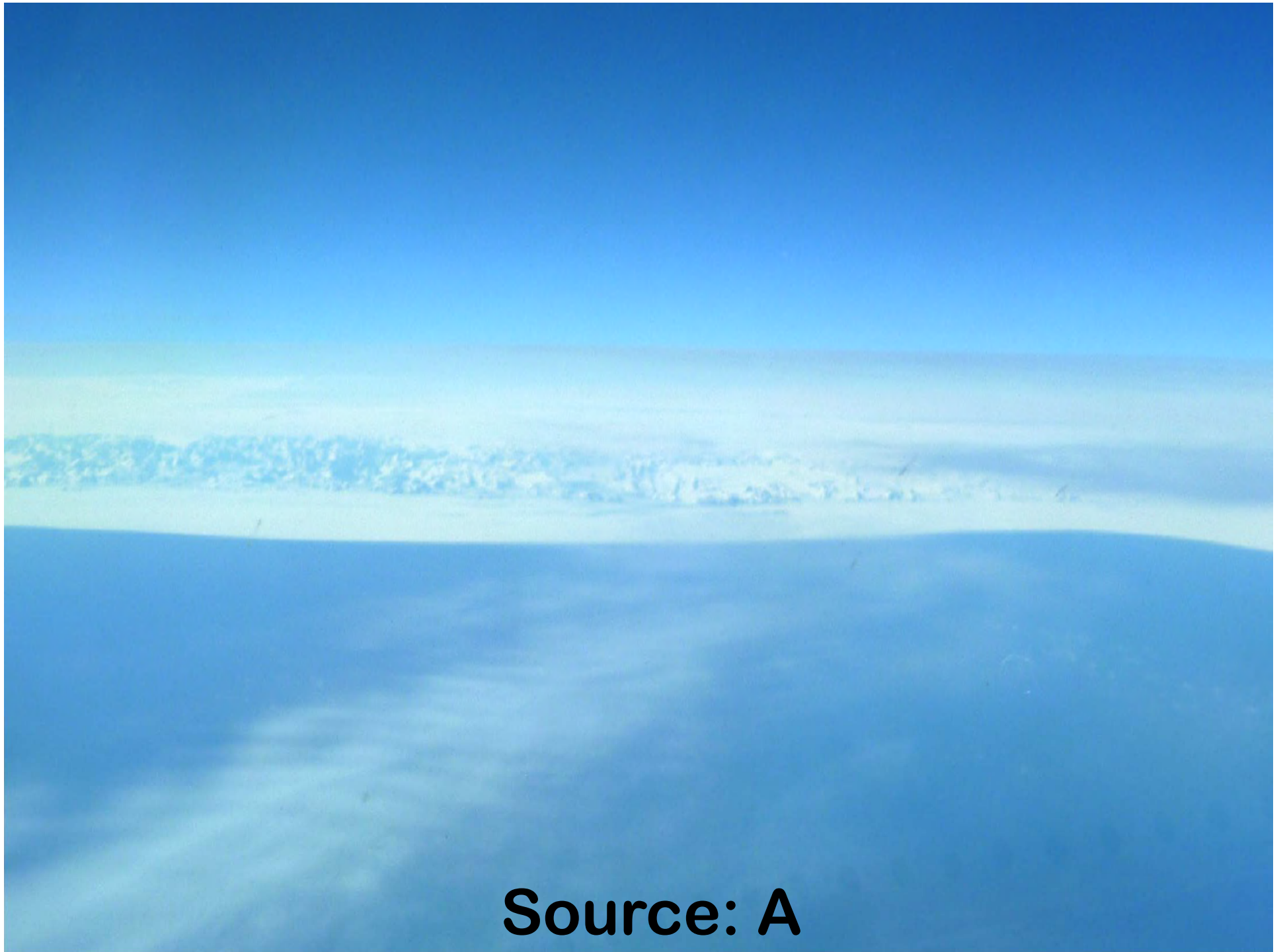


Source: B

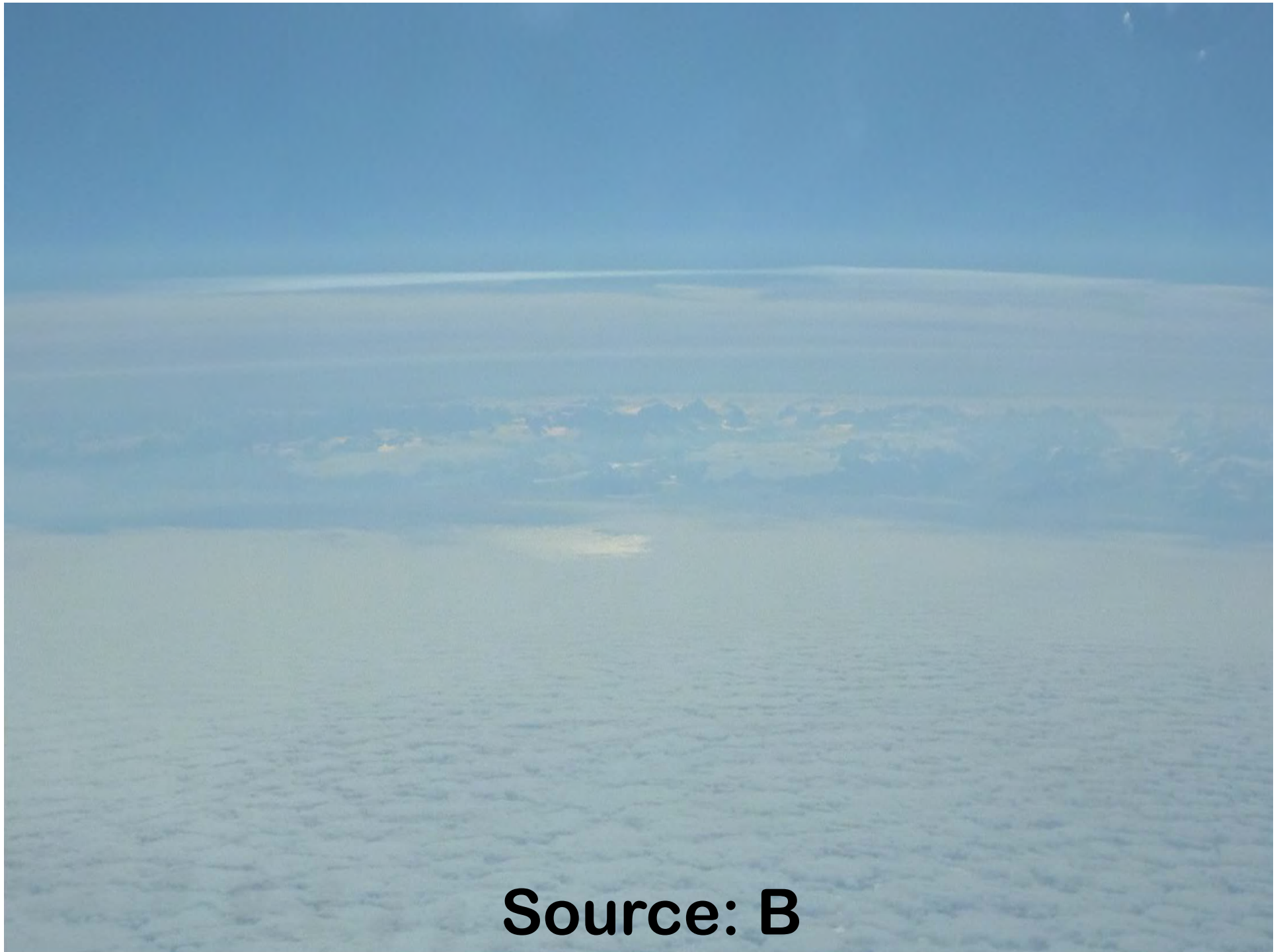




Source: D



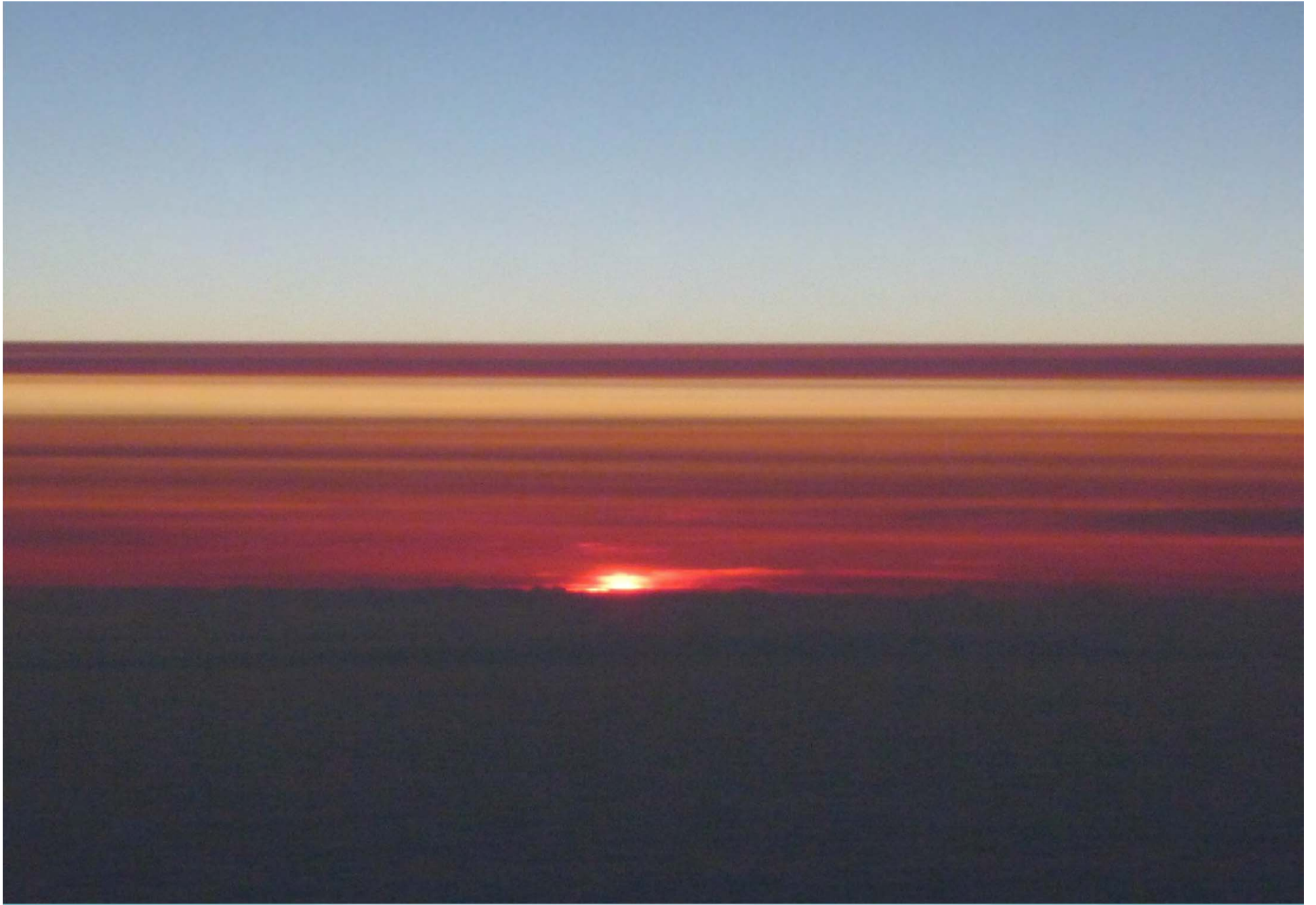
Source: A



Source: B



Source: D



Source: A



Source: B



Source: D

The next slide contains the solution.

**Which pictures show smoke / aerosol
that was put into the air by forest fires
?**

A ? B ? C ? D ?

Decoding:

**Source A: Grimsvötn SO₂ – cloud
2011**

**Source B: Smoke from forest fires
and pyro-CB in Canada**

Source C: Puyehue, 2011

Source D: Eyafjellajakull, 2010









Volcanic Ash: Setting the limit or not?

- **Why to set the limits?**
- **What do we need to know?**
- **What do we have?**
- **What do we required?**

WHY TO SET THE LIMITS?

It is of special interest to pilots defining the concept of "Visible Ash".

There is presently no clear threshold for the composition and concentration of ash that is hazardous to aviation.

WHAT DO WE NEED TO KNOW?

Pilots need to know the exact location and size of the volcanic ash cloud and where it will be located in the future (FORECAST).

WHAT DO WE HAVE?

Currently, pilots have only:

- Air manuals
- SOP

*To address the potential effects of
“volcanic” ash.*

Volcanic Ash

Condition: Volcanic ash is suspected when one or more of these occur:


- A static discharge around the windshield
- A bright glow in the engine inlets
- Smoke or dust on the flight deck
- An acrid odor.

Objective: To exit the ash cloud and restart engines if needed.

Caution! Exit the volcanic ash as quickly as possible. Consider a 180° turn. Consider a descending turn.

- 1 Don oxygen masks and smoke goggles, as needed.
- 2 Establish crew communications, as needed.
- 3 Autothrottle (if engaged) Disengage

If conditions allow, run the engines at idle thrust.

- 4  Thrust levers (both) Close

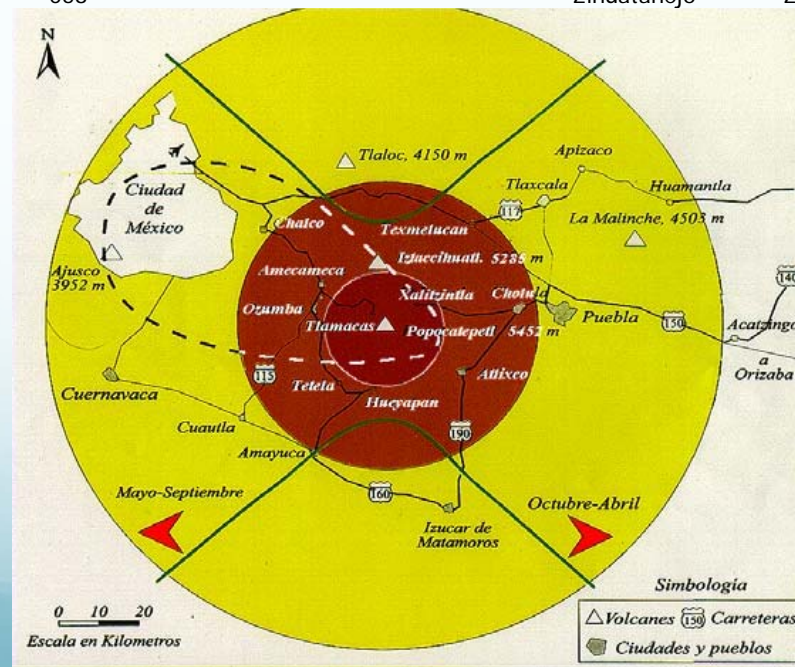
This reduces possible engine damage or flameout, or both, by decreasing EGT.

- 5 ENGINE START switches (both) FLT
- 6 PACK switches HIGH
- 7 ENG ANTI-ICE switches (both) ON
- 8 WING ANTI-ICE switch ON

□ Continued on next page □

LUGARES CON PROBABILIDAD DE AFECTACIÓN DE ACUERDO CON LA DIRECCIÓN E INTENSIDAD DEL VIENTO, A PARTIR DEL CRÁTER

Dirección donde proviene el viento:	La ceniza se desplaza hacia:	
042°	Cuatla	CUA
068°	Cuernavaca	CVA
130°	A. I. C. M.	MEF
105°	Toluca	TLC
234°	Puebla	PBC
146°	Sta. Lucía	SLM
163°	Otumba	OTU
193°	Apan	APN
259°	Veracruz	VER
315°	Oaxaca	OAX
230°	Nautla	NAU
187°	Tampico	TAM
209°	Poza Rica	PAZ
128°	Querétaro	QET
141°	San Luis Potosí	SLP
104°	Guadalajara	GDL
105°	Morelia	MLM
122°	Bajío	BJX
124°	Aguascalientes	AGU
021°	Acapulco	ACA
058°	Zihuatanejo	ZIH



HERE IS WHERE THE REAL PROBLEM LIES

- **How we defined volcanic ash visibility?**
- **How we can discern it?**
- **What are the minimum values of visibility?**
- **What is the minimum concentration of ash?**

IF THERE IS NO ANSWERS!

1. Avoid, Avoid, Avoid
2. PIREPS
3. Meteorological agencies
4. Satellite detection

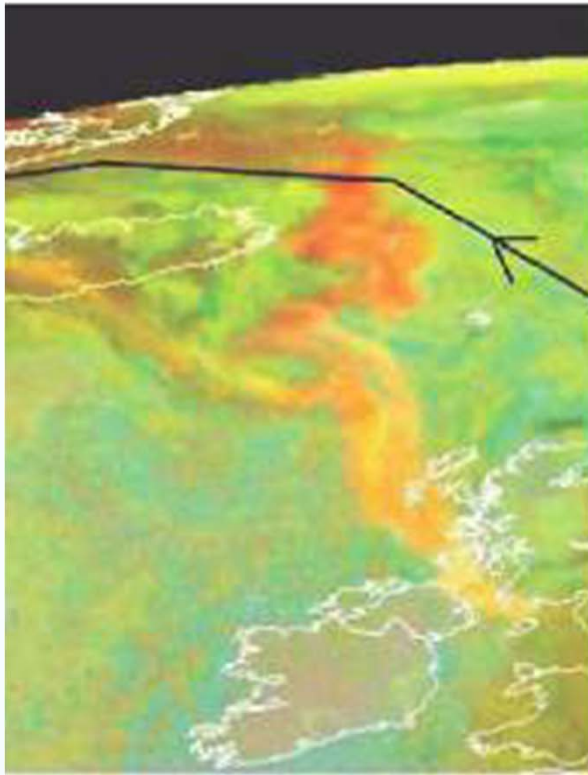
Basic rule: Avoid visible ash!

WHAT DO WE REQUIRED?



↑
Dispatcher briefing a flightcrew on route-details.

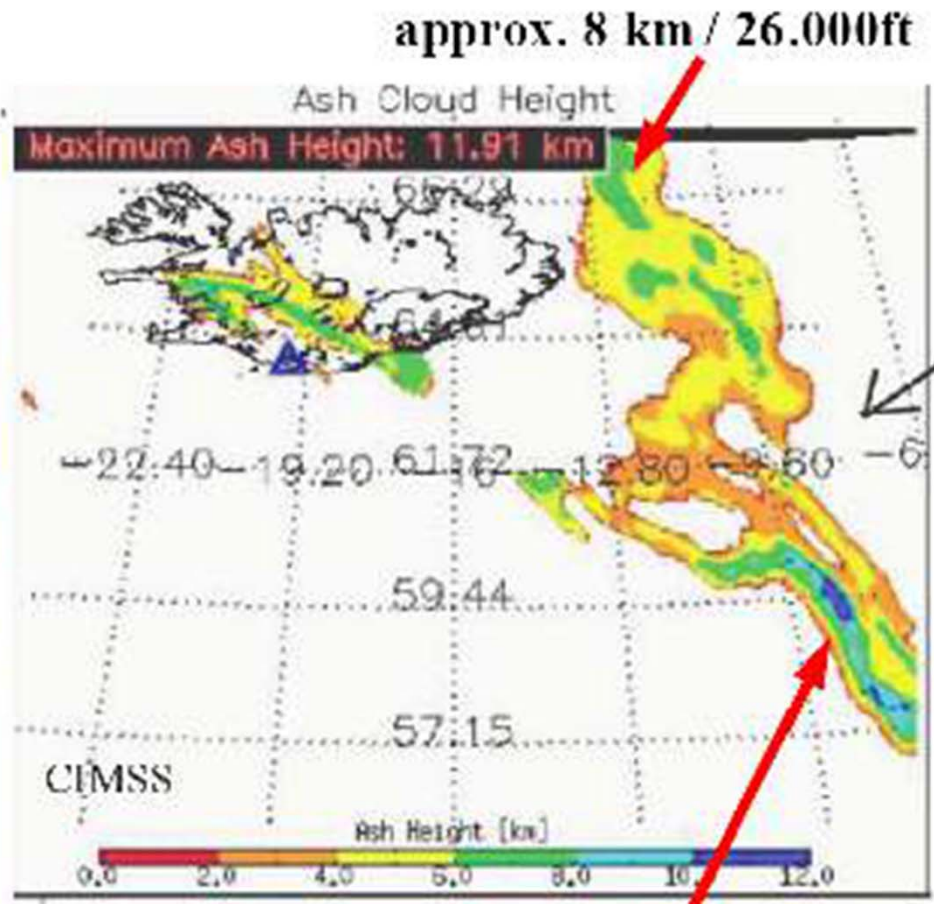
Clear and easy to understand doc's



018-05-14 05:00 UTC EUM

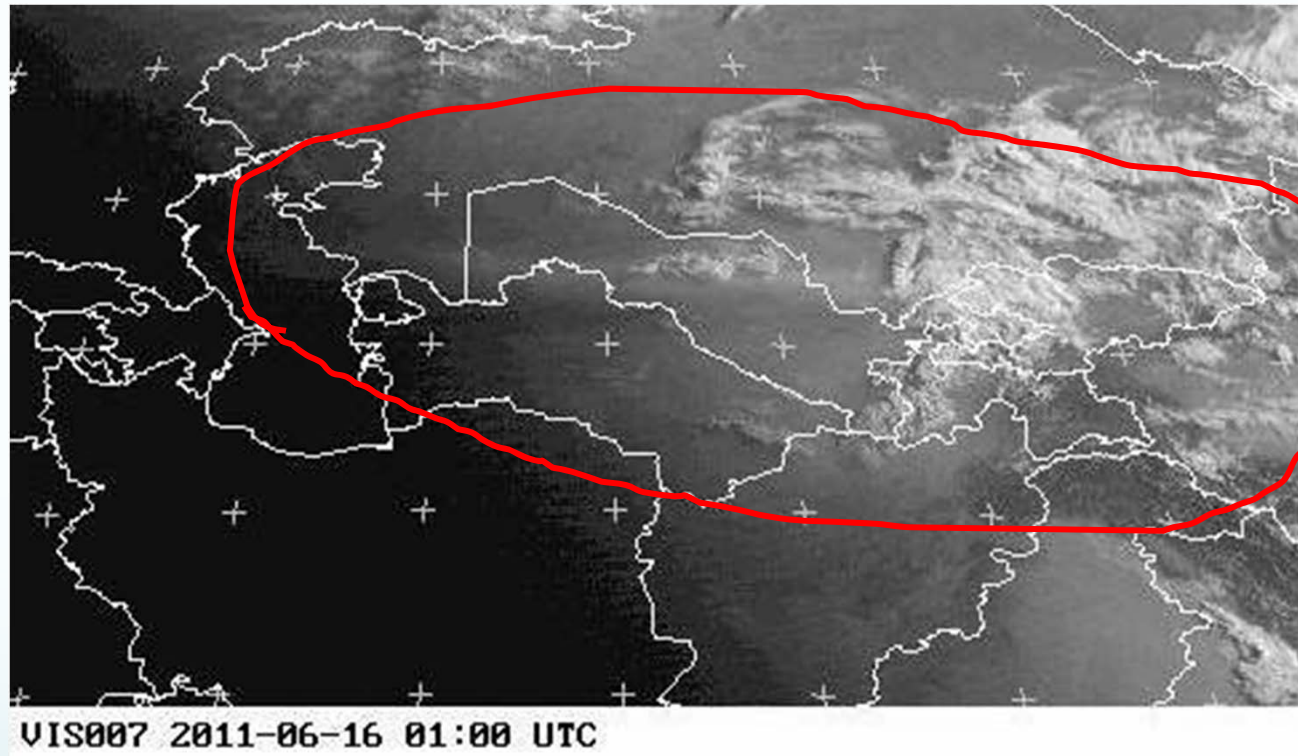
Good supplement / reality-check
for VA charts. **Requirement:**

VA-sat-pictures with height & concentration.



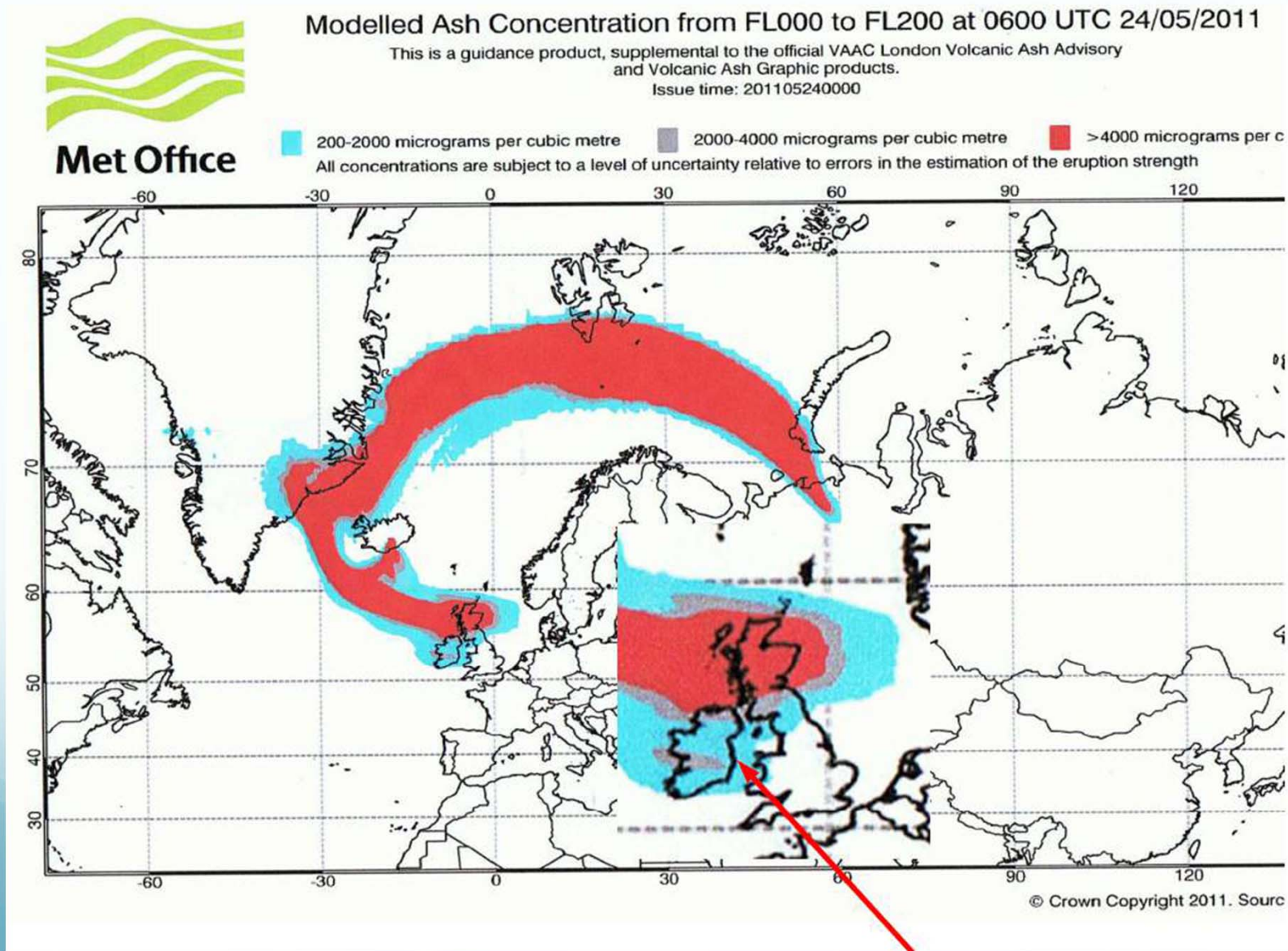
**VA-satellite pictures with height and
concentration info**

Bands of volcanic SO₂ aerosol / sulfate clouds from Nabro



Need SO₂- charts also forecast

Requirements to inform crews of fresh SO₂ so they can prepare to avoid



¡ THANK YOU!

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