

Some Comments on  
the GeoEngineering Watch video,  
“The Dimming”



Bob Endlich

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Cruces Atmospheric Sciences Forum

15 Oct 2022

## Acknowledgements:

Edward Burlbaw helped me get the Video on a jump drive for the presentation.

Kurt Kleiner helped with Mountain Wave picture in Montana.

# Outline

We'll watch the first minutes of "The Dimming."

As we get into the presentation, we find egregious errors. We illustrate the basics of contrail formation and contrail forecasting used by military forecasters.

- Introductory graphics from the video "The Dimming."
- My Cold War experiences as a SAC B-52 Forecaster, providing weather support to Crew Training Missions, SAC Ground Alert & Airborne Alert Missions. Information security, protection of Classified Defense Information.
- The Skew-T, Log-P diagram for plotting upper atmosphere variables.
- AWS Tech Reports and the Appleman Curves for Contrail Forecasting
- Dust, frequently clay minerals, transported vertically and horizontally, frequently trans-continentally.
- Mountain Wave Clouds frequently indicate vertical motions in stable atmospheres when lifting brings the air to saturation.
- At times, mountain wave clouds and contrails co-exist: the dead give-away that Contrail appearance and disappearances are linked to vertical motions in the atmosphere giving GeoEngineering Watch the Wrong Answers.

<https://www.geoengineeringwatch.org>

GEOENGINEERINGWATCH.ORG PRESENTS

# THE DIMMING

EXPOSING THE GLOBAL CLIMATE ENGINEERING COVER-UP





# GeoEngineering Watch



## Geoengineering

Geoengineering is the artificial modification of Earth's climate systems through two primary ideologies, Solar Radiation Management (SRM) and Carbon Dioxide Removal (CDR)



## Chemtrailing

Chemtrailing is the public's term for the CLASSIFIED ONGOING artificial modification of Earth's climate systems using reflective nano-materials (aerosols) to reflect sunlight. The aerosols are dispersed via jet aircraft trails that expand into reflective artificial clouds.



## Solar Radiation Management (SRM)

Solar Radiation Management (SRM), controlling sunlight before it reaches the planet.



This is the crazy idea “Climate Expert” Bill Gates proposes to “Stop Dangerous Global Warming.” Geoengineering Watch is not directly working on this....Yet?



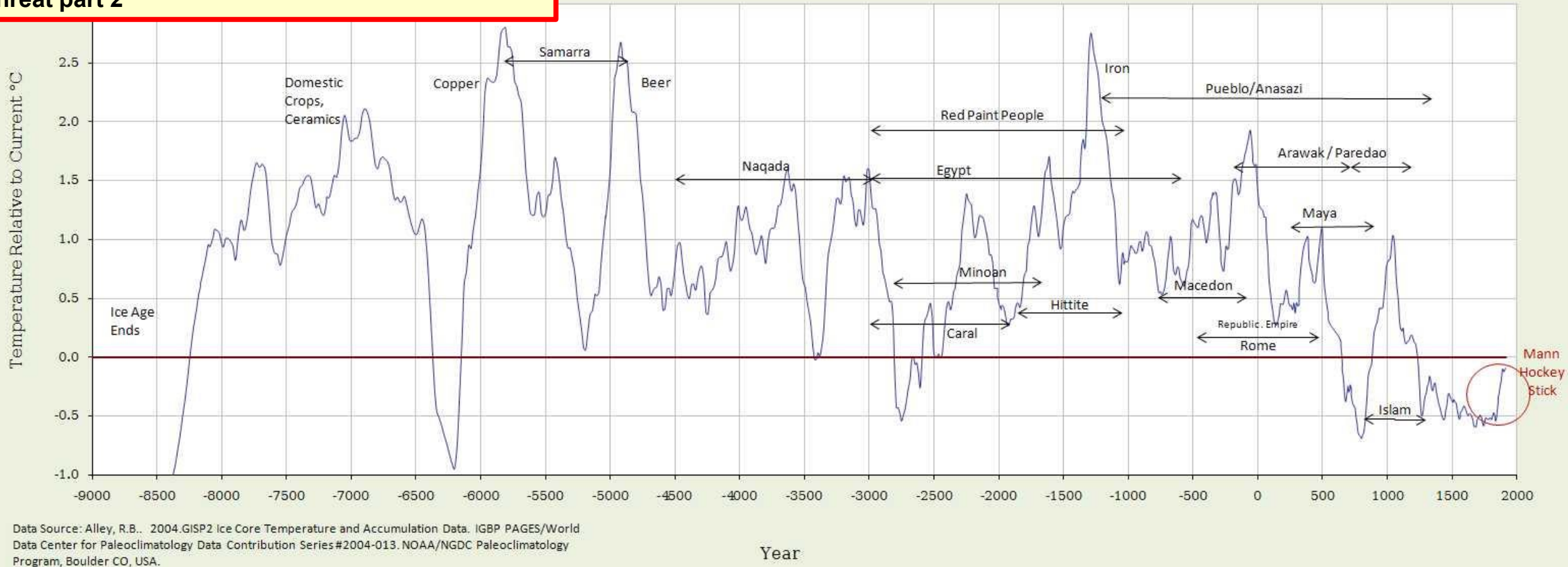
## Stratospheric Sulfate Aerosols Geoengineering (SAG-SRM)

The ability of stratospheric sulfate aerosols to create a global dimming effect has made them a possible candidate for use in geoengineering projects to limit the effect and impact of climate change due to rising levels of greenhouse gases. Delivery of precursor sulfide gases such as hydrogen sulfide (H<sub>2</sub>S) or sulfur dioxide (SO<sub>2</sub>) by artillery, aircraft and balloons has been proposed. (click image for more...)

Temperature Time Series showing that most of the past 10,000 years **were warmer** than at present; more warming is no threat, certainly not the “Existential Threat” of which alarmists decry.

**SIDEBAR, CLIMATE HISTORY FROM NEW VISITORS “Warming not an Existential Threat part 2”**

GISP 2 Greenland Ice Core Temperature - Current Interglacial



Since 13,000 years ago, warmer temperatures and more CO2 in the air enabled agriculture, more food for humans and farm animals, development of language, culture, art, architecture, cities, medicine, in short, *civilization*.



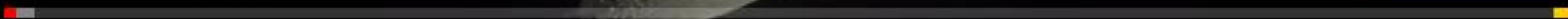
# The Dimming, Full Length Climate ...



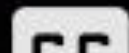
## THE DIMMING

GeoengineeringWatch.org

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0:55 / 1:56:51



YouTube



**STOP CLIMATE ENGINEERING**

[GeoEngineeringWatch.org](http://GeoEngineeringWatch.org)

City of Robinson Park

# Experience: Duty Forecaster and Chief Forecaster: Glasgow AFB, Montana, 3 yrs



13<sup>th</sup> Fighter Interceptor Sq



Alert Tankers, other birds, here

13<sup>th</sup> FIS

Alert Bombers in the "Christmas Tree"



91<sup>st</sup> Bombardment Wing (H) (SAC)

SAC B-52 bombers on Ground Alert. In the 1960s, we provided alert crews paper Alert Flimsies, weather planning & execution forecasts from Glasgow AFB to their Emergency War Order targets, and their recovery bases. We provided explicit winds aloft and contrail forecasts in these Alert Packages which went to the Alert Force twice every day.



Chain-Link Fence

We had B-52Ds; these look like B-52Hs (Barksdale?)

Crews were on alert in the Alert Facility 24x7

## SAC B-52 bomber on Airborne Alert

SAC scheduled us for six-week periods, two B-52s <with nuclear weapons on board, crews fully briefed on routes to and details of, their specific targets> to fly Chrome Dome Missions, 24-hour missions, forty-five days in a row. There were two refuelings on these missions, one off Labrador, the other over Alaska.



## SIDEBAR ON CHROME DOME

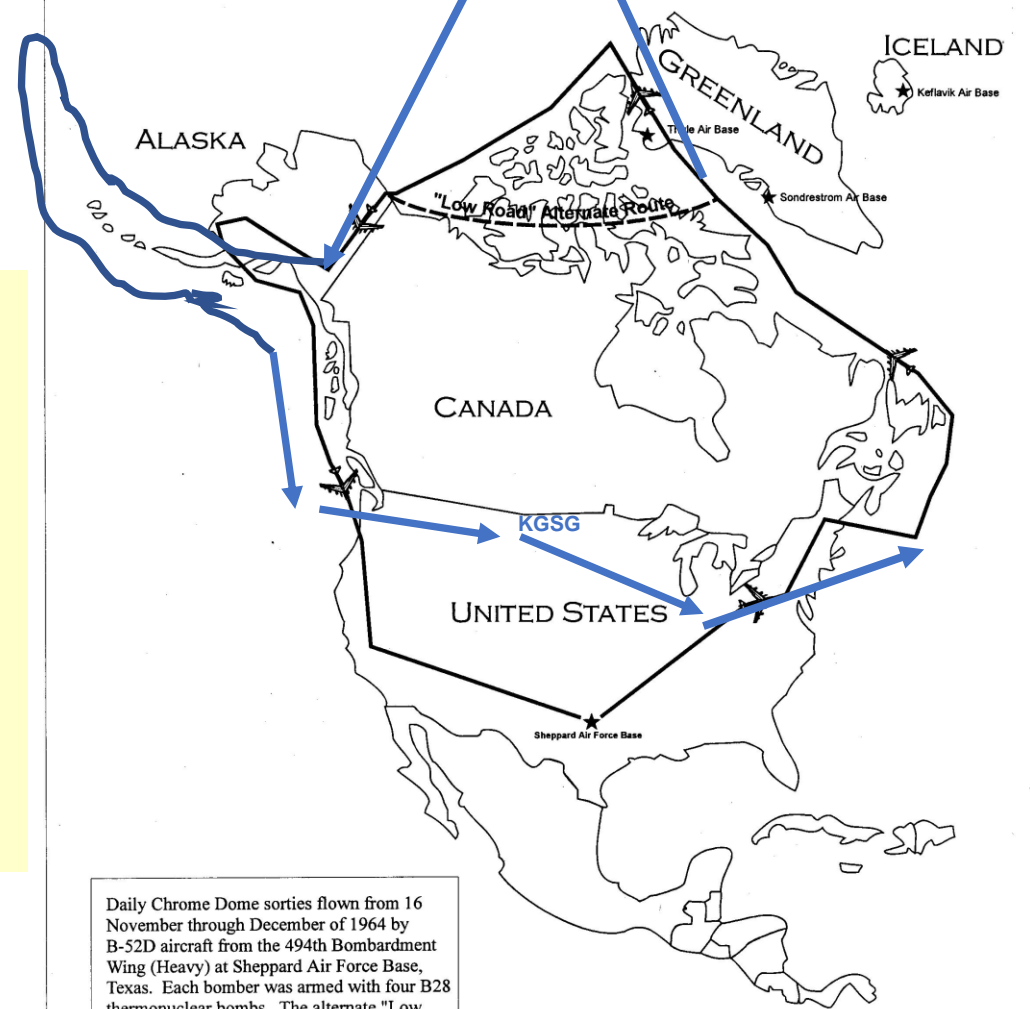
Basic graphic came from Shepard AFB, Wichita Falls, TX  
494<sup>TH</sup> Bomb Wing (Heavy) B-52Ds

Routes in Blue were our 24-hour routes from and to  
Glasgow AFB, MT, ICAO KGSG.  
We were the 91st Bomb Wing (Heavy) B-52Ds

Westernmost at  
Diomedede Islands

North Pole

### Northern Chrome Dome Route November-December 1964



Daily Chrome Dome sorties flown from 16 November through December of 1964 by B-52D aircraft from the 494th Bombardment Wing (Heavy) at Sheppard Air Force Base, Texas. Each bomber was armed with four B28 thermonuclear bombs. The alternate "Low Route" would be flown in case of HF radio malfunction.

History, 494 Bombardment Wing (Heavy), October-December 1964, K-WG-494-HI, AFHRC, Exhibit 15.



Aerodynamic Contrails. NOT the concern of Geoengineering Watch. These formed at the outside edge of the wing flaps as the aircraft is on final approach. The pressure drop of the air is greatest here, and the adiabatic cooling brings the ambient moist air to saturation; water droplets form spontaneously.



# Engine Exhaust Contrails from combustion of Jet Fuel

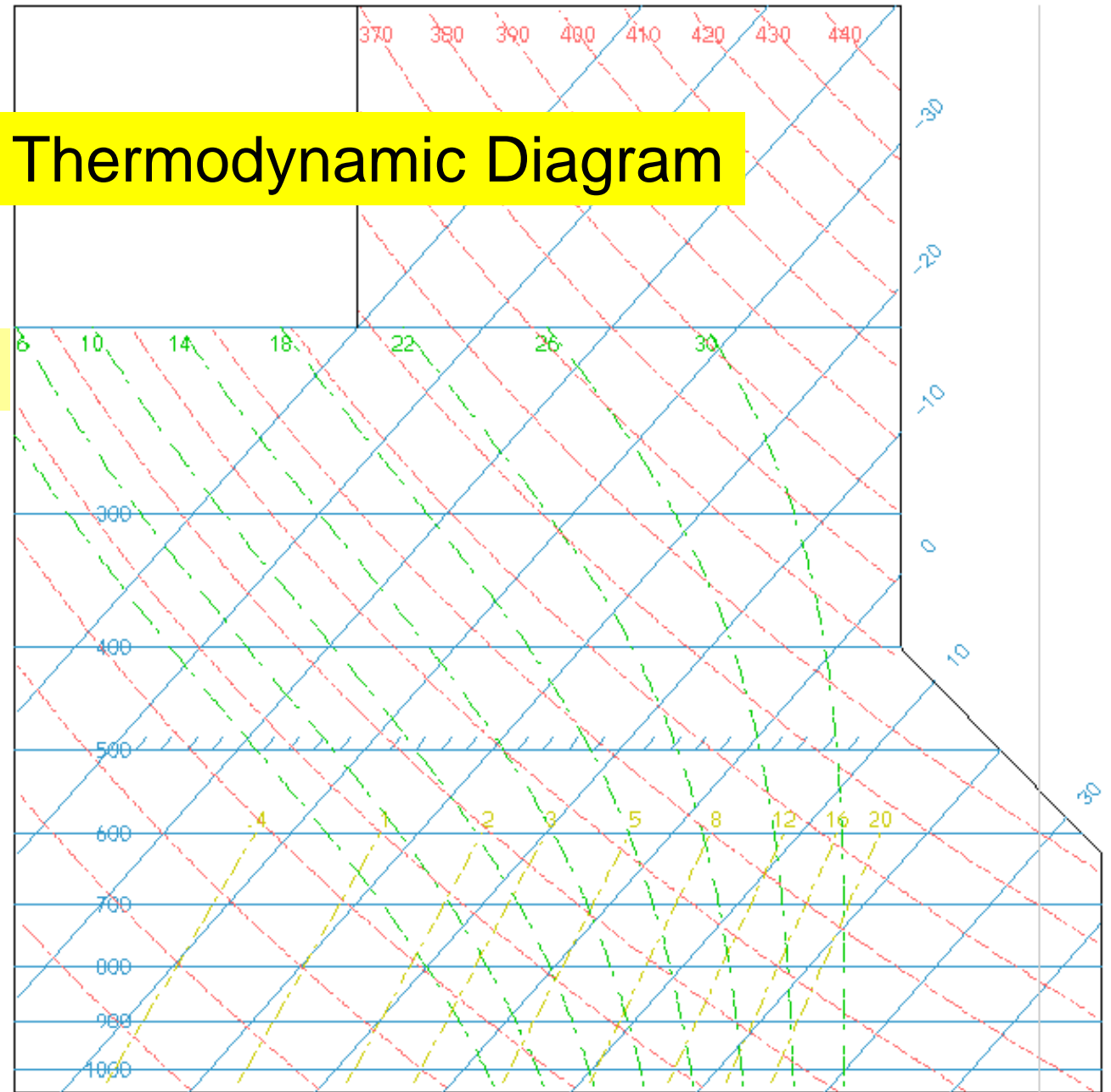


# Engine Exhaust Contrails from combustion of Jet Fuel



# Basics of the Skew-T, Log P Thermodynamic Diagram

“Graph Paper for Meteorologists”



SKEN-T/LOG-P VALID 0000 UTC 03/13/2020 KEPZ

Lat = 31.87 , Lon = -106.70

# Atmospheric Analysis Basics of the Skew-T Log-P diagram Axes Labeled

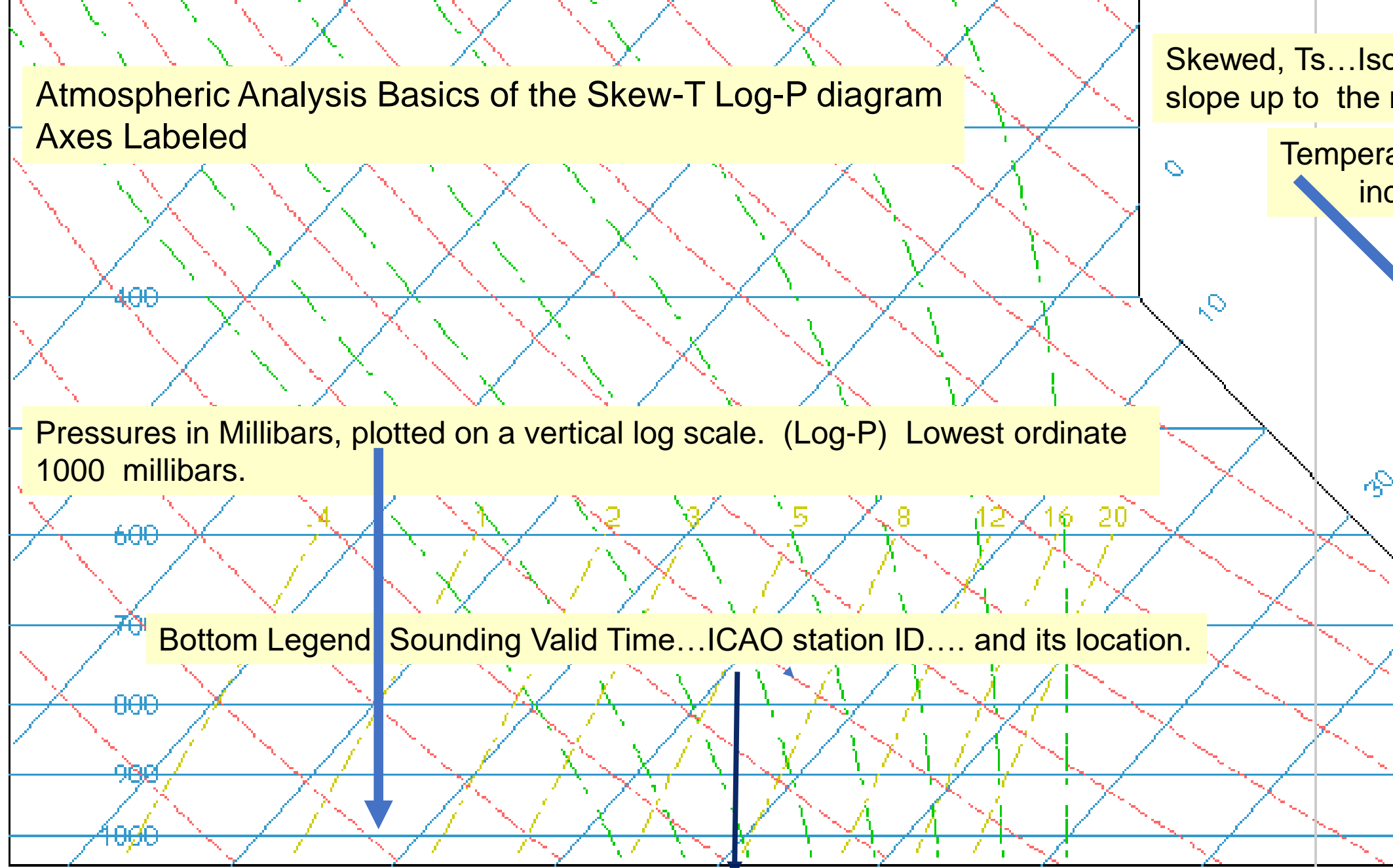
Skewed, Ts...Isotherms  
slope up to the right...

Temperature values  
increase to right

Pressures in Millibars, plotted on a vertical log scale. (Log-P) Lowest ordinate  
1000 millibars.

Bottom Legend Sounding Valid Time... ICAO station ID.... and its location.

SKEW-T/LOG-P VALID 0000 UTC 03/13/2020 KEPZ Lat = 31.87 , Lon = -106.70



# Skew-T Diagram

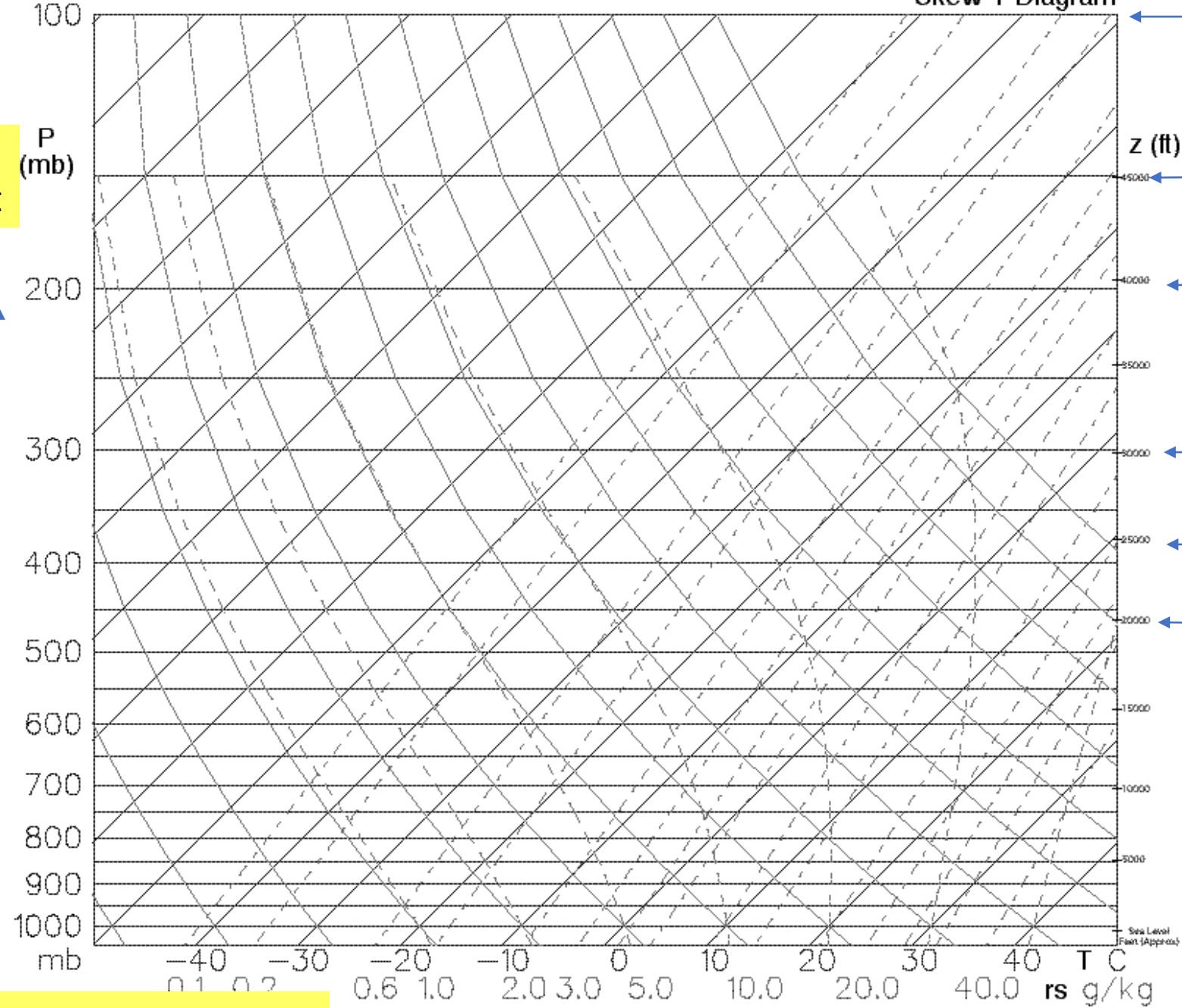
B-52 Service Ceiling when very light

53,000 Ft

KC-135 Service Ceiling when very light

45,000 Ft

Y-Axis Pressure, mb, Log Scale, "Log-P"

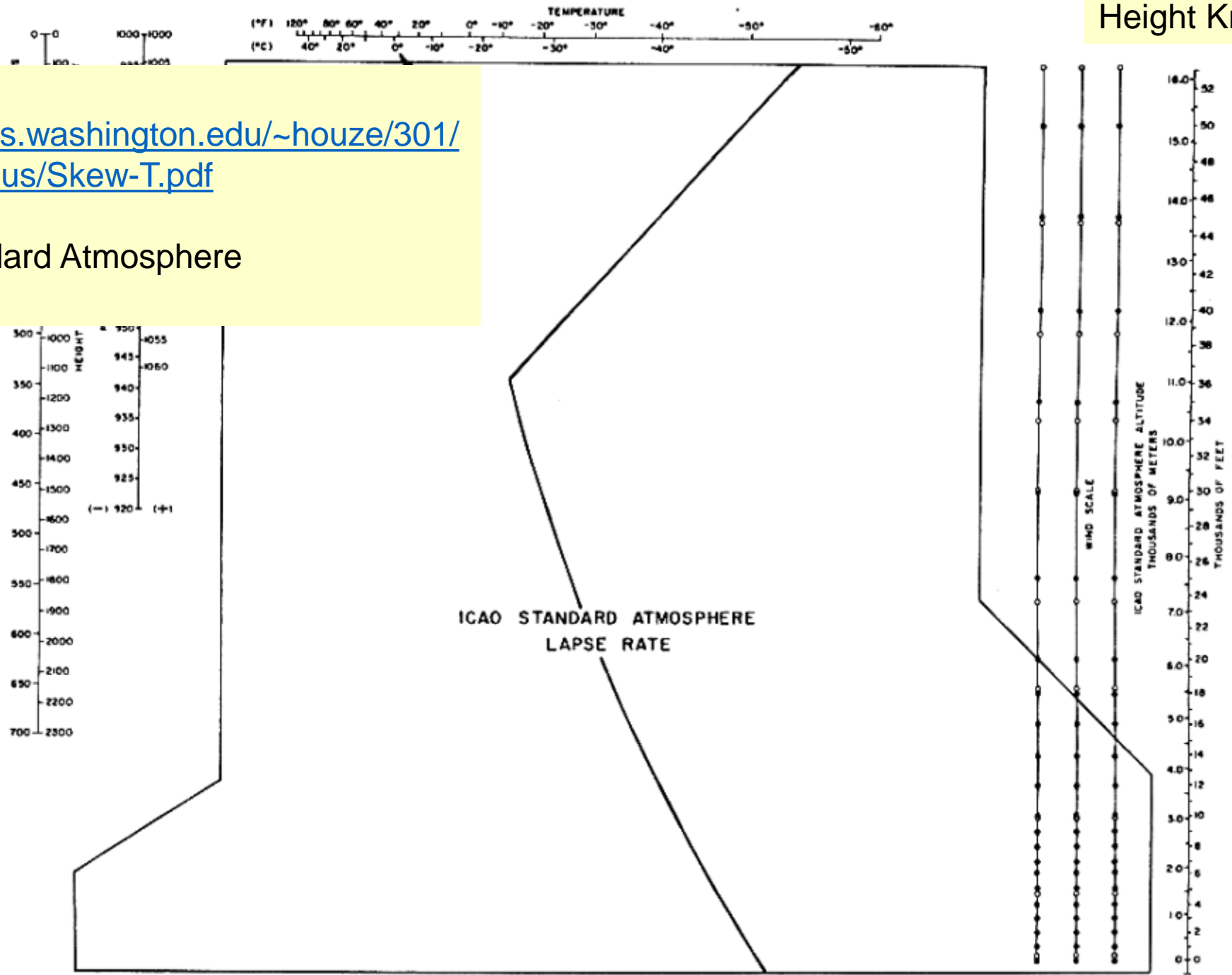


Y-Axis, geometric height.

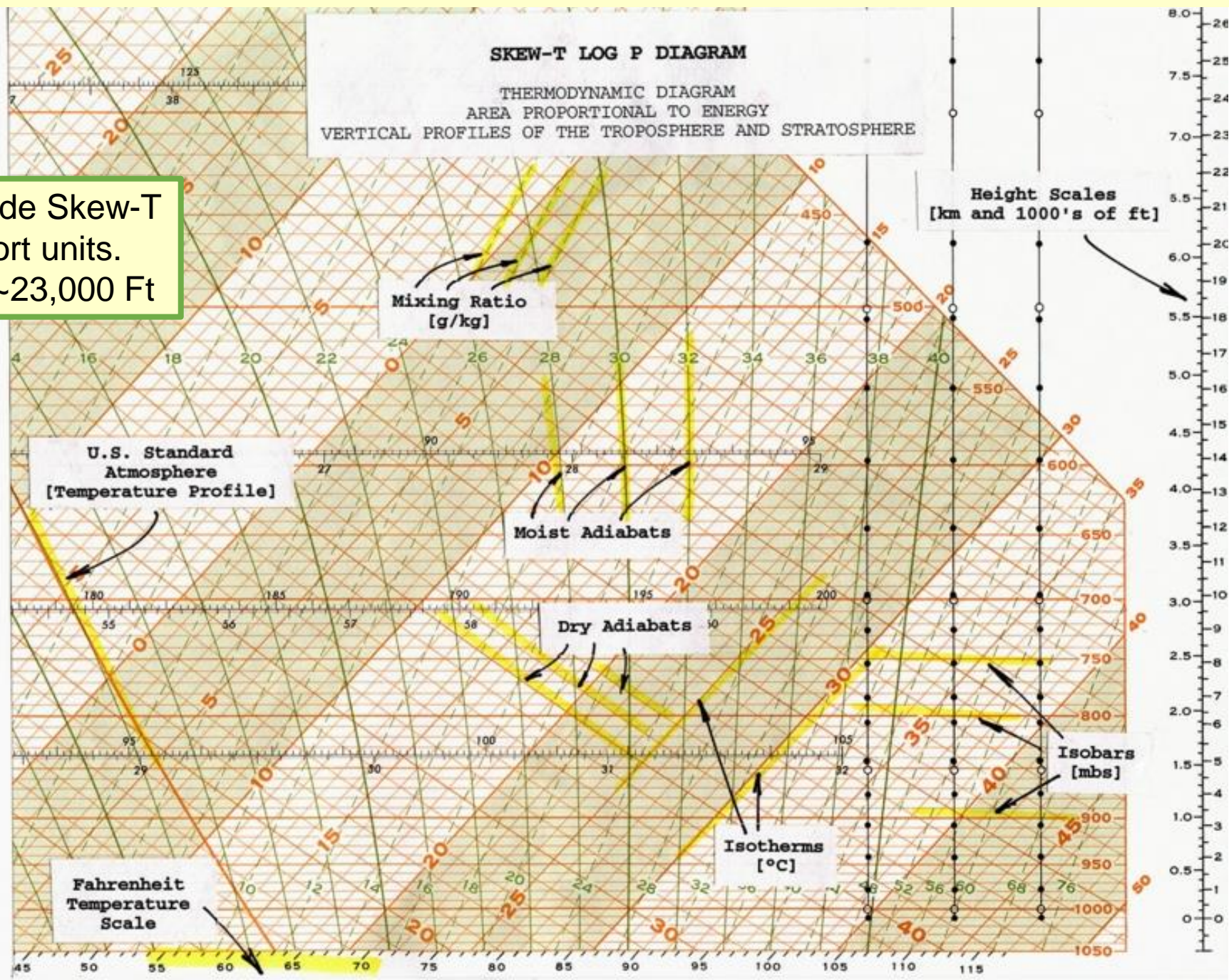
X-Axis Temperature--- but skewed aloft. "Skew-T"

<https://atmos.washington.edu/~houze/301/Miscellaneous/Skew-T.pdf>

### ICAO Standard Atmosphere



This is the low altitude Skew-T used by Army support units. Top only ~400 mb. ~23,000 Ft





Pw = 1.83

Also, Blue in the Vertical; Pressures decrease logarithmically

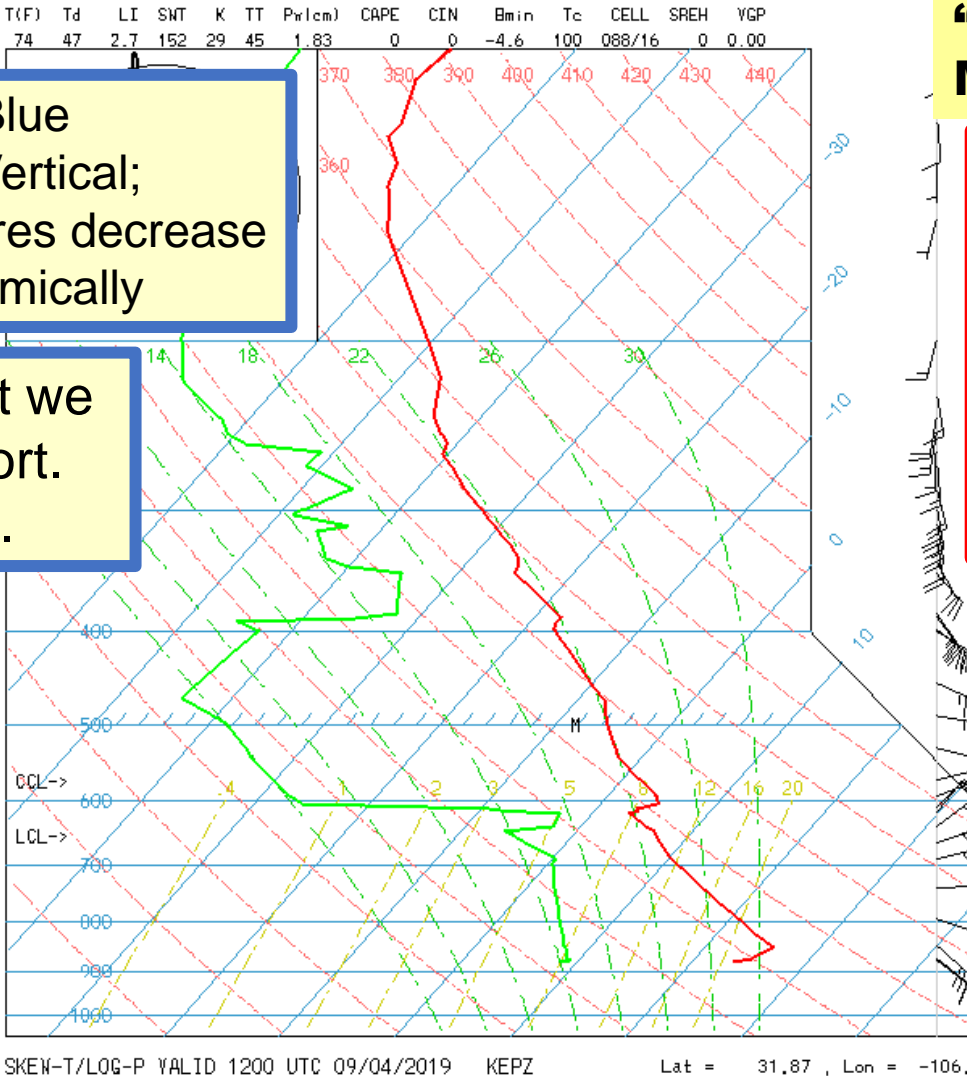
This is the high-altitude chart we used for SAC Weather Support. Goes to 100 mb or ~10 miles.

**“Graph paper” for Meteorologists**

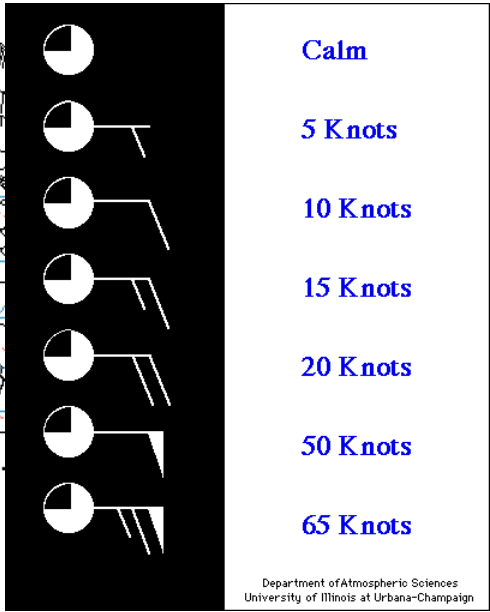
The RED line is the Temperature from the weather balloon sounding

The GREEN LINE is the Dew Point Temperature from the same sounding.

4 Sep 2019/1200Z



Skewed Temperatures in Blue



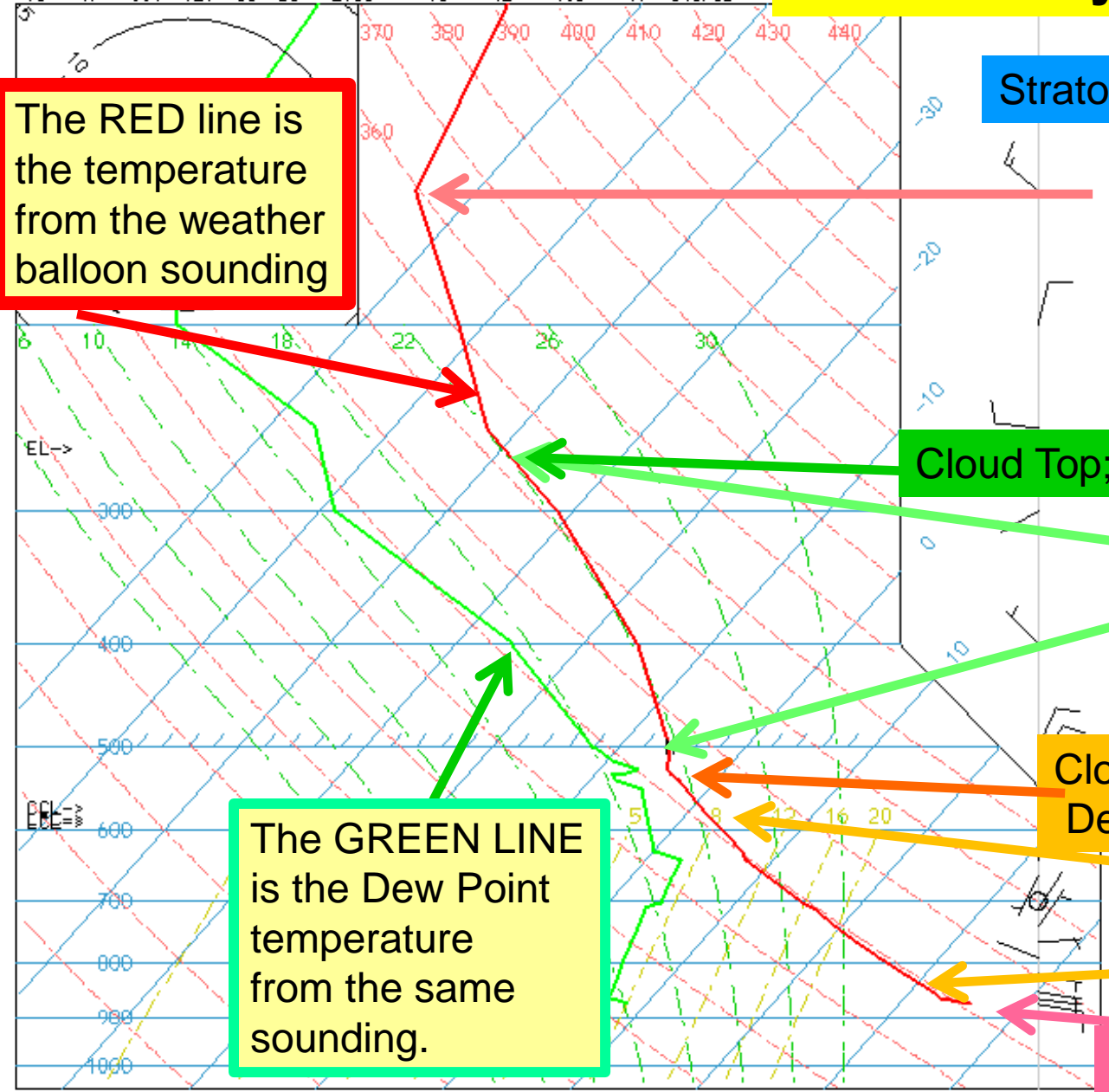
The Skew-T allows easy calculation of dozens of thermodynamic variables

Analysis block on the Skew-T Log-P diagram

TIME		TIME	
<b>SKEW T - LOG P ANALYSIS</b>			
<b>AIRMASS ANALYSIS</b>			
TYPE	BOUNDARY _____ FT.	_____ FT.	_____ FT.
TYPE	BOUNDARY _____ FT.	_____ FT.	_____ FT.
TYPE	BOUNDARY _____ FT.	_____ FT.	_____ FT.
FREEZING LEVEL(S)			
<b>INVERSIONS</b>			
FRONTAL			
RADIATION			
SUBSIDENCE			
TROPopause			
L.C.L.			
C.C.L.			
L.F.C.			
<b>SIGNIFICANT WIND</b>			
MAX.			
MIN.			
LEVELS OF SHEAR			
<b>STABILITY</b>			
INDEX		INDEX	
TO		TO	
TO		TO	
TO		TO	
<b>CLOUDS</b>			
TYPE			
AMOUNT			
BASES			
TOPS			
<b>ICING</b>			
TYPE			
SEVERITY			
BOUNDARIES			
<b>CONTRAILS</b>			
PERSISTENCE			
HEIGHT			
<b>TURBULENCE</b>			
DEGREE			
HEIGHT(S)			
MAX WIND GUSTS			
HAIL SIZE			
<b>TEMPERATURES</b>			
MAX.			
MIN.			
CUMULUS CLOUD FORMATION AT TEMP _____ TIME _____			
DISSIPATION OF LOW LEVEL INVERSION AT _____ TIME _____			
REMARKS			
FORECASTER		FORECASTER	

# Plot of 10 July 2017 Monsoon Evening Sounding

T(F) Td LI SWT K TT Pw(m) CAPE CIN Bmin Tc CELL SRE  
96 47 -0.1 129 33 50 2.68 13 -42 -1.8 97 046/05



The RED line is the temperature from the weather balloon sounding

The GREEN LINE is the Dew Point temperature from the same sounding.

Stratosphere, above Tropopause

Probable Tropopause

Cloud Top; no longer moist adiabatic abv

Cloud Layer: Moist Adiabatic

Cloud Base: Min Temperature-Dewpoint Depression

Planetary Boundary Layer ~ Dry Adiabatic

Surface Layer Superadiabatic

A NASA science lesson for students teaching through demonstration. Students learn about properties and changes of properties of matter, as they witness firsthand how contrails are formed.

### Non-Persistent Contrails



[https://www.nasa.gov/sites/default/files/atoms/files/contrails\\_k-12.pdf](https://www.nasa.gov/sites/default/files/atoms/files/contrails_k-12.pdf)

### Persistent Contrails



(Photo courtesy of NASA)

“They (trails behind aircraft engines) shouldn’t be there. Jet Engines burn clean.”

# The Dimming, Full Length Climate En...



<All of these are my attempts to characterize the voice of the speaker, my best efforts>

Geoengineering Watch

Play (k)

engineeringWatch.org

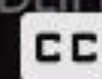
ALLAN BUCKMANN

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US AIR FORCE WEATHER OBSERVER  
CA DEPT. FISH AND GAME WILDLIFE BIOLOGIST



1:14 / 1:56:50



HD





“They (trails behind aircraft engines) shouldn't be there. Jet Engines burn clean.”

Just wrong. Spectacularly Wrong!

Engines work because of fuel combustion. Below, from FL State U Chemistry Dept.



<https://www.chem.fsu.edu/chemlab/chm1020c/Lecture>



“Whenever we complete a combustion reaction a hydrocarbon (compound of C and H) there are generally the same products formed: CO<sub>2</sub> and H<sub>2</sub>O.” <Water (H<sub>2</sub>O) is a product of combustion!>

“The fuel you burn in your car's engine contains octane, C<sub>8</sub>H<sub>18</sub>. When octane is burned, the products are CO<sub>2</sub> & H<sub>2</sub>O.  
 $2\text{C}_8\text{H}_{18}(\text{l}) + 25\text{O}_2(\text{g}) \rightarrow 16\text{CO}_2(\text{g}) + 18\text{H}_2\text{O}(\text{g})$ ” (l is liquid, g is gas)  
(In my Torino, the carburetor mixes the liquid gasoline, the Octane, with the Oxygen in the air, the O<sub>2</sub>)

You don't need to be in an aircraft at 30,000 ft to see water droplets coming from the exhaust of a combustion engine.

Here, the fuel is combusted, yielding  $\text{CO}_2$ , invisible, and  $\text{H}_2\text{O}$  vapor, normally invisible. But when a vehicle first starts, exhaust's heat is lost to a cold exhaust system and cold air, especially on a winter's morning. Under those circumstances, water vapor in the exhaust condenses, visible in the form of a water droplet cloud, obvious here.



[https://www.facebook.com/  
TheAlaskaLife/photos/a/](https://www.facebook.com/TheAlaskaLife/photos/a/)

If and when the water droplets freeze, an ice cloud forms.

Aloft, this is a cirrus cloud.



"This is what 40° below and ice fog looks like at high noon at Fairbanks, Alaska."



# Analyzing for and Forecasting for Engine Contrails

The original Appleman Contrail Forecast Nomogram from Herbert Appleman, 1953.

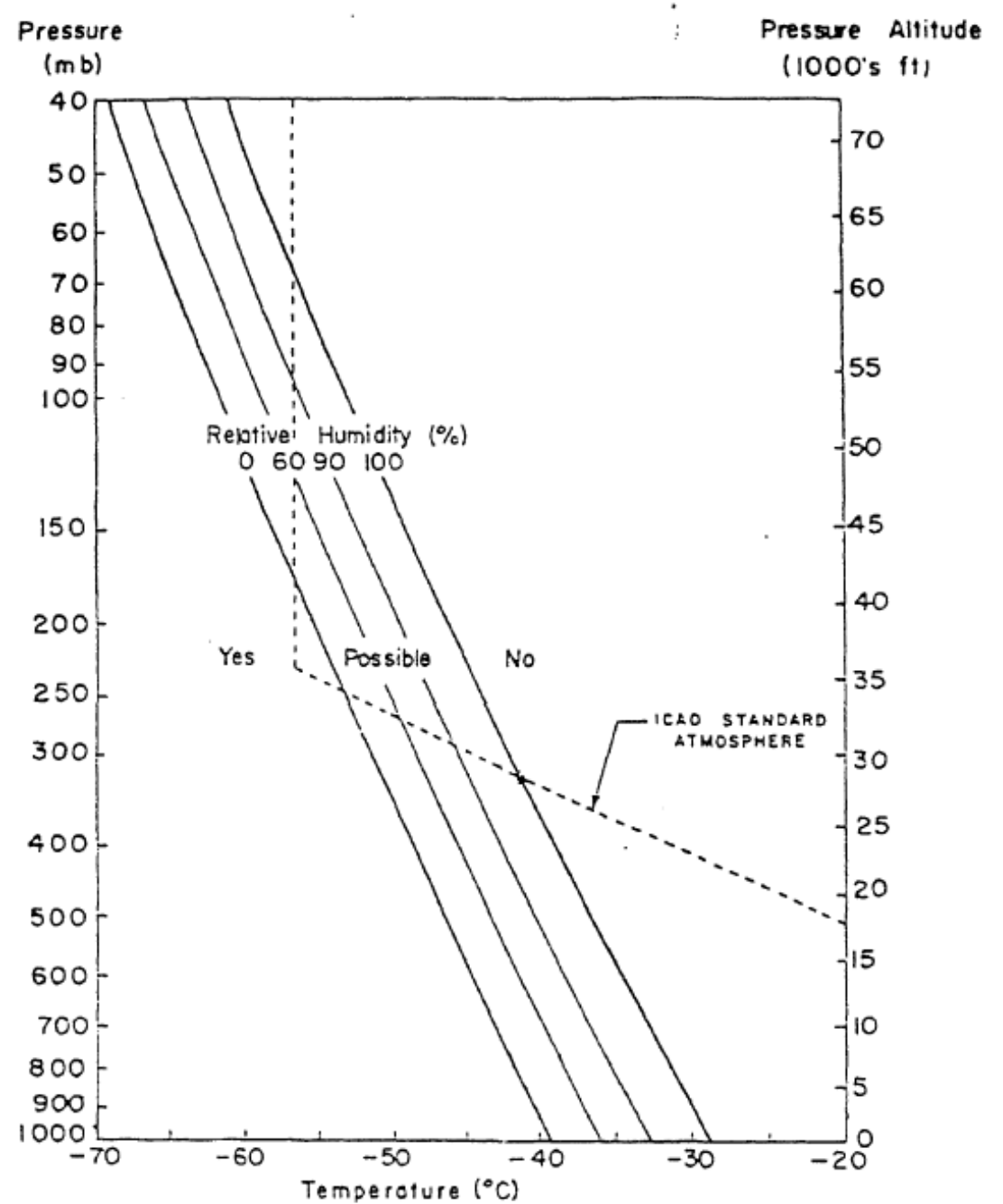


Figure 1. The Appleman Contrail Forecast Nomogram (1953).

# Some Basics of using the Appleman Chart to forecast Aircraft Exhaust Contrails

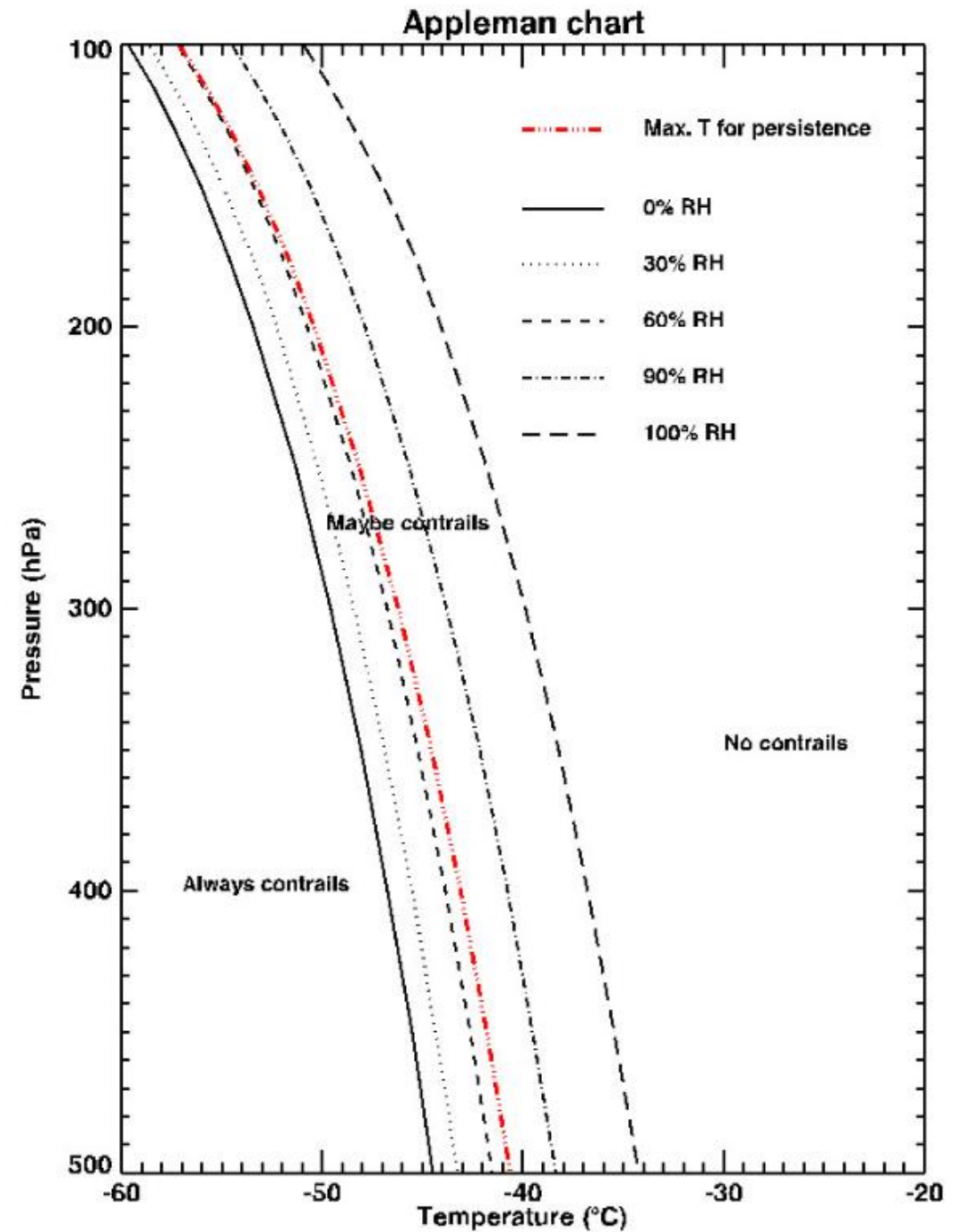
53,000 Ft

39,000 ft

30,000 Ft

23,000 Ft

18,504 Ft



BULLETIN AMERICAN METEOROLOGICAL SOCIETY

The Formation of Exhaust Condensation Trails by Jet Aircraft

H. APPLEMAN Hqs, Air Weather Service, Washington 25, D. C.

ABSTRACT

This paper defines the meteorological state of the atmosphere which will give rise to the formation of condensation trails (contrails) as the exhaust from an aircraft engine mixes with and saturates the environment. Three basic assumptions were made with regard to the formation of visible contrails: (1) contrails are composed of ice crystals; (2) water vapor cannot be transformed into ice without first passing through the liquid phase, thus necessitating an intermediate state of saturation with respect to water; (3) a minimum visible water content of 0.004 gm/m<sup>3</sup> is required for a faint trail and 0.01 gm/m<sup>3</sup> for a distinct trail. This last requirement proved of no importance in determining whether or not a trail would form but did affect its persistence.

[https://www.nasa.gov/sites/default/files/atoms/files/contrails\\_k-12.pdf](https://www.nasa.gov/sites/default/files/atoms/files/contrails_k-12.pdf)

Navy photo of F/A-18 in flight.



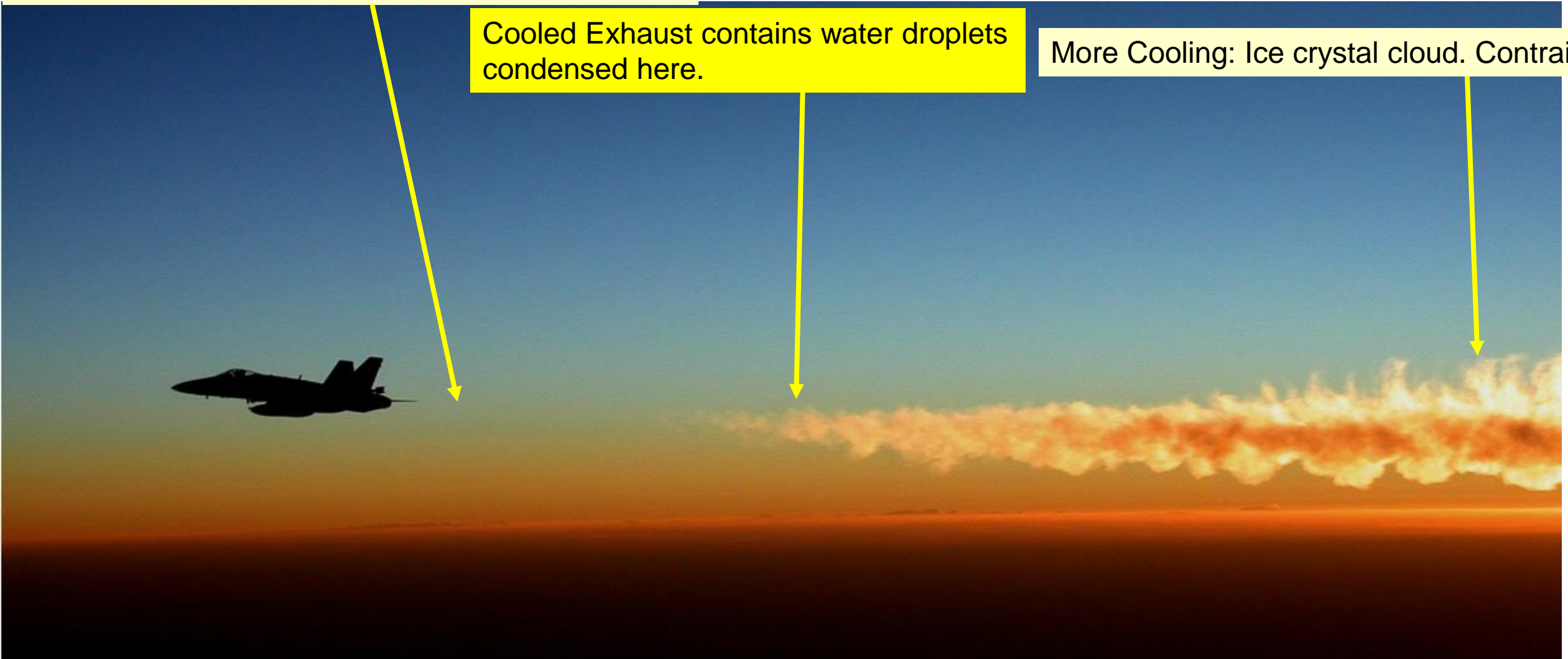
[https://www.nasa.gov/sites/default/files/atoms/files/contrails\\_k-12.pdf](https://www.nasa.gov/sites/default/files/atoms/files/contrails_k-12.pdf)

Navy photo of F/A-18 in flight.

Hot engine exhaust contains CO<sub>2</sub> and H<sub>2</sub>O vapor.

Cooled Exhaust contains water droplets condensed here.

More Cooling: Ice crystal cloud. Contrail.



<https://www.globe.gov/web/s-cool/home/observation-and-reporting/contrails/appleman-chart-teacher>

53,000 Ft

39,000 ft

<http://www.tpub.com/weather3/6a-26.htm>  
( Aerography/Meteorology)

Rules of thumb in areas of no humidity data:

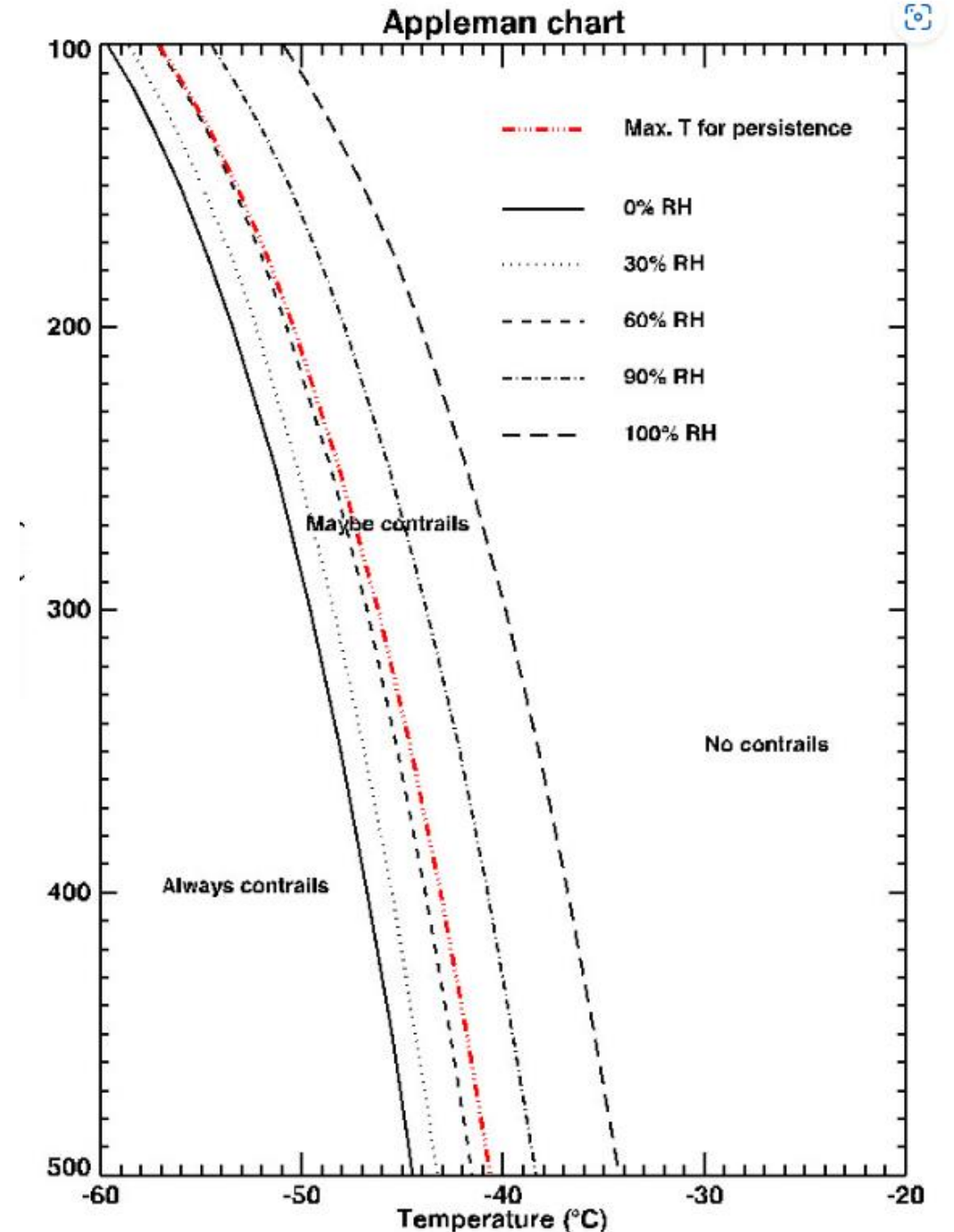
No clouds at flight level: Assume 40% Relative Humidity.

Some Clouds at flight level: Assume 70% Relative Humidity

30,000 Ft

23,000 Ft

18,504 Ft



In some Weather units, Contrail Analysis was part of the Local Analysis and Forecast program

SEV T - LOG P ANALYSIS			
TIME		TIME	
AIRMASS ANALYSIS			
TYPE BOUNDARY	_____ FT.	_____	FT.
TYPE BOUNDARY	_____ FT.	_____	FT.
TYPE			
FREEZING LEVEL IN _____			
INVERSIONS			
FRONTAL			
RADIATION			
SUBSIDENCE			
TROPopause			
L.C.L.			
C.C.L.			
L.F.C.			
SIGNIFICANT WIND			
MAX.			
MIN.			
LEVELS OF SHEAR			
STABILITY INDEX			
TO _____		TO _____	
TO _____		TO _____	
TO _____		TO _____	
CLOUDS			
TYPE			
AMOUNT			
BASES			
TOPS			
ICING			
TYPE			
SEVERITY			
BOUNDARIES			
CONTRAILS			
PERSISTENCE			
HEIGHT			
TURBULENCE			
DEGREE			
HEIGHT(S)			
MAX WIND GUSTS			
HAIL SIZE			
TEMPERATURES			
MAX.			
MIN.			
CUMULUS CLOUD FORMATION AT TEMP _____ TIME _____			
DISSIPATION OF LOW LEVEL INVERSION AT _____ TIME _____			
REMARKS			
FORECASTER		FORECASTER	

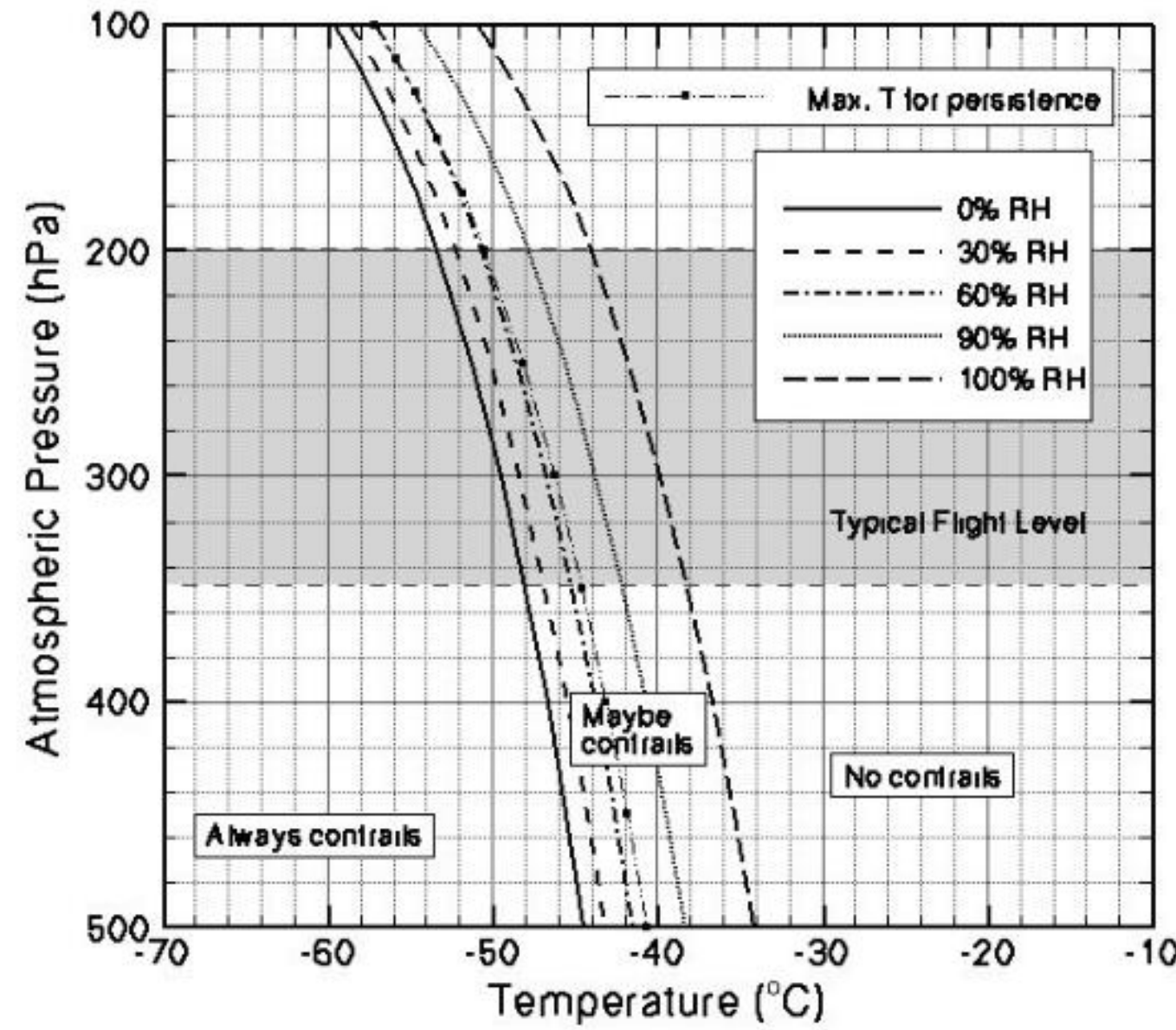


CLOUDS					
TYPE					
AMOUNT					
BASES					
TOPS					
ICING					
TYPE					
SEVERITY					
BOUNDARIES					
CONTRAILS					
PERSISTENCE					
HEIGHT					
TURBULENCE					
DEGREE					
HEIGHT(S)					
MAX WIND GUSTS					
HAIL SIZE					
TEMPERATURES					
MAX.					
MIN.					
CUMULUS CLOUD FORMATION AT TEMP _____ TIME _____					
DISSIPATION OF LOW LEVEL INVERSION AT _____ TIME _____					
REMARKS					
FORECASTER			FORECASTER		

<https://www.globe.gov/web/s-cool/home/observation-and-reporting/contrails/appleman-chart-teacher>

We will see soon that the contrail formation observations and atmospheric relative humidity curves were determined experimentally by direct observation of contrail formation (or non-formation) through specially conducted flights of two Military aircraft very near in space and time to radiosonde balloon ascents.

# Appleman Chart





- Appleman, H.S., 1953: The Formation of Exhaust Condensation Trails by Jet Aircraft, Bull. Amer. Met. Soc., Vol. 34, No. 1, 14-20.
- Appleman, H.S., 1957: Derivation of Jet-Aircraft Contrail-Formation Curves, AWS TR 105-145, January 1957 (AD-125760).
- AWS, 1953: A Further Analysis of Contrail Data, AWS TR 105-112, December 1953 (AD-26922). This TR was made obsolete by AWS TR 105-145 above.
- AWS, 1954: Memorandum on Effect of Engine Power Setting on Contrail Formation and Intensity, AWS TR 105-126, August 1954 (AD-74310).

They are absolutely not contrails. Contrails do not linger, dissipate, and go into cloud cover. Period. End of Report!"

GeoengineeringWatch.org

<All of these are my attempts to characterize the voice of the speaker, my best efforts>

Play (k)

GeoengineeringWatch.org

CHARLES JONES

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US AIR FORCE BRIGADIER GENERAL (RET.)

FORMER TACTICAL WEATHER RECONNAISSANCE PILOT



1:22 / 1:56:50



**AWS TR 105-145**

**AIR WEATHER SERVICE TECHNICAL REPORT**

125760

**DERIVATION  
OF JET-AIRCRAFT  
CONTRAIL-FORMATION CURVES**

**Herbert S. Appleman**

**JANUARY 1957**

## 2.2. Procedure.

Project Cloud Trail was established within the Air Defense Command in conjunction with Air Weather Service, to collect high-level weather information from jet aircraft. The aircraft were to accumulate sufficient data to serve as a basis for improved methods of forecasting contrails, cirrus clouds, haze, and turbulence. Only the contrail portion of the Project is considered here. The observational phase of the Project ran from 1 December 1954 to 15 December 1955. During this period, 36 fighter-interceptor squadrons based in the United States collected data over 23 upper-air sounding stations. The procedure employed was as follows:

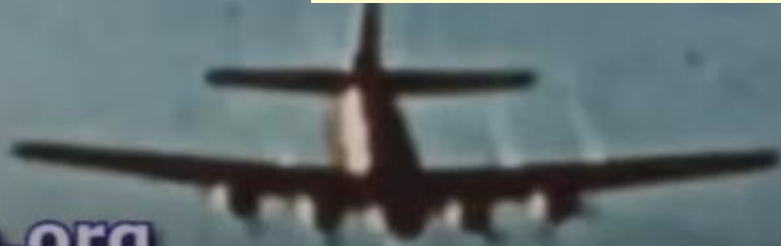
- a. Each day from approximately one hour before to two hours after 1530 GCT, two aircraft were vectored to a point 25,000 feet above an upper-air sounding station. The aircraft then climbed to the maximum altitude obtainable, maintaining position within 30 miles of the station.

b. The wingman observed whether or not the lead aircraft produced exhaust trails and whether they were continuous or intermittent, distinct or faint, including bases and tops of layers in which the trails formed.

paraphrased... "we have photographic evidence from WW2 of our B-17's at altitude turning OFF the sprayed dispersion materials....clearly these bombers were used for Beta Testing. These photographs PROVE it."



# The Dimming, Full Length Climate ...



<All of these are my attempts to characterize the voice of the speaker, my best efforts>



GeoengineeringWatch.org

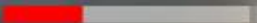
Play (k)

DANE WIGINGTON

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LEAD RESEARCHER

GEOENGINEERINGWATCH.ORG



3:47 / 1:56:50



YouTube



paraphrased... "we have photographic evidence from WW2 of our B-17's, at altitude, turning OFF the sprayed dispersion materials....clearly these bombers were used for Beta Testing. These photographs PROVE it."



Consider the time that these photos were taken, at the height of WW2, with the war against Germany on-going in Europe, and the war's Pacific phase on-going against Japan.

Dean Wigginton proposes that in the midst of these two phases of WW2 that someone, he doesn't say who, is carrying on some concurrent and nefarious third war against Earth or elements of humanity.

A war whose perpetrators he does not identify.

A Secret War...he says this is <still> CLASSIFIED (!) and whose belligerents are still unknown almost 80 years after the fact? I used to be Unit Security Officer, and Unit Commander. This is not believable.

From the previous slide: "This is not believable." Here's Why.

<https://www.archives.gov/declassification/iscaap/auto-declass-exemptions.html>

E.O. 13526 prescribes a "uniform system for classifying, safeguarding, and declassifying national security information." The Order declares that the democratic principles of our nation require that the American people be informed of the activities of their Government while it simultaneously acknowledges that "the national interest has required that certain information be maintained in confidence in order to protect our citizens, our democratic institutions, and our participation within the community of nations."

Based on these principals, Executive Order 13526, "Classified National Security Information" requires the automatic declassification of records of permanent historical value that are more than 25 years old,

The Order also recognizes that some information might remain sensitive and pose a threat to the national security if released at the 25-year mark such as information which reveals the identity of a confidential human source, human intelligence source, or key design concepts of weapons of mass destruction, which may have a duration up to 75 years.

Therefore, the Order allows agency heads to identify this information & provides for its further protection.  
<Bolds and underlining added>



From a previous slide: "This is not believable." Here's Why.

<https://www.archives.gov/declassification/isca/ap/auto-declass-exemptions.html>

Based on these principals, Executive Order 13526, "Classified National Security Information" requires the automatic declassification of records of permanent historical value that are more than 25 years old ...

When I was in the Department of Defense, the Information Security Regulations required Automatic, time-phased, downgrading of Classified Defense Materials.

TOP SECRET would be automatically downgraded to SECRET

SECRET would be automatically downgraded to CONFIDENTIAL.

CONFIDENTIAL would be automatically be DECLASSIFIED.

AD-E850130

AWS/TR-81/001

3



ADA111876



**FORECASTING  
AIRCRAFT CONDENSATION  
TRAILS**

DTIC FILE COPY

September 1981

DTIC  
ELECTR  
MAR 11 1982  
A

Approved For Public Release; Distribution Unlimited

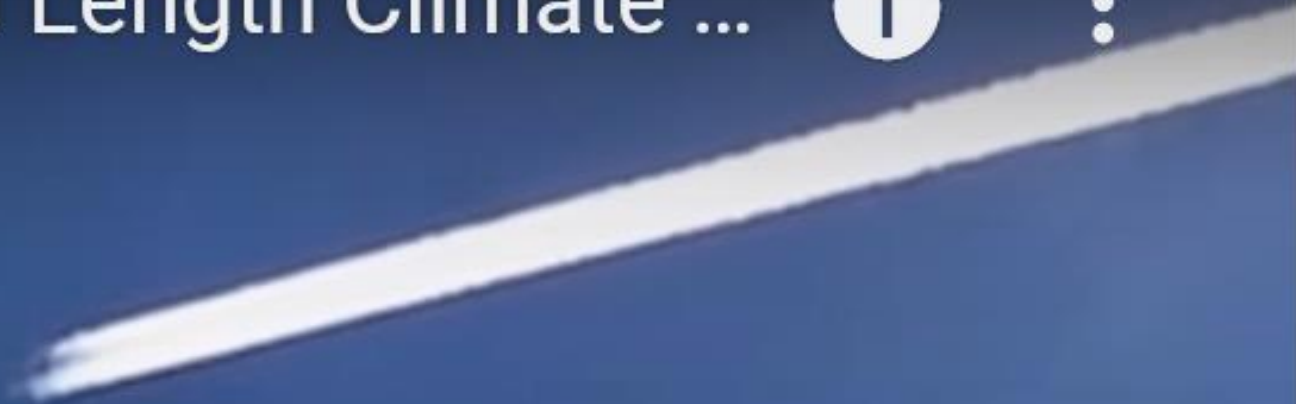
AIR WEATHER SERVICE (MAC)  
Scott AFB, Illinois 62225

82 90 01 120

“We have film of aircraft at altitude, nozzles visible, turning on and off. That is the end of the argument.”



# The Dimming, Full Length Climate ...



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2:56 / 1:56:51



YouTube



“...what we see in the sky today is not condensation. It is sprayed particulate dispersions....”

The Dimming, Full Length Climate En...



Play (k)

engineeringWatch.org

DANE WIGINGTON

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LEAD RESEARCHER  
GEOENGINEERINGWATCH.ORG



“Most are unfamiliar with the Science Term “Global Dimming.” This term refers to the amount of global sunlight that is no longer reaching the surface of the Earth, caused by light scattering particles that are building up in the atmosphere.”

# GLOBAL DIMMING

A DECREASE IN THE AMOUNT OF SUNLIGHT REACHING THE EARTH. BELIEVED TO BE CAUSED BY POLLUTION IN THE ATMOSPHERE.



GeoengineeringWatch.org

SUBSCRIBE

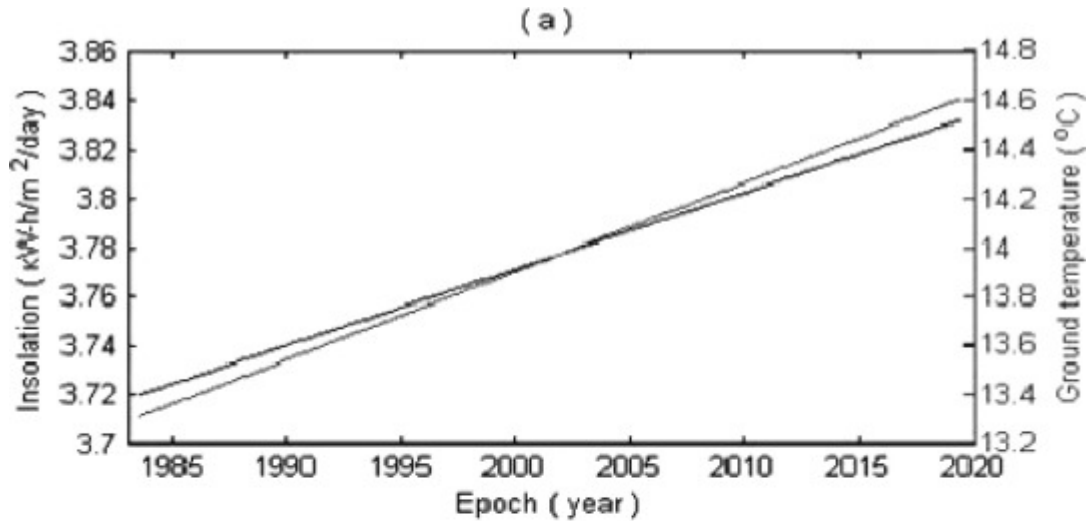
Bob Comment. Not True! Next graphics.



1:52 / 1:56:50

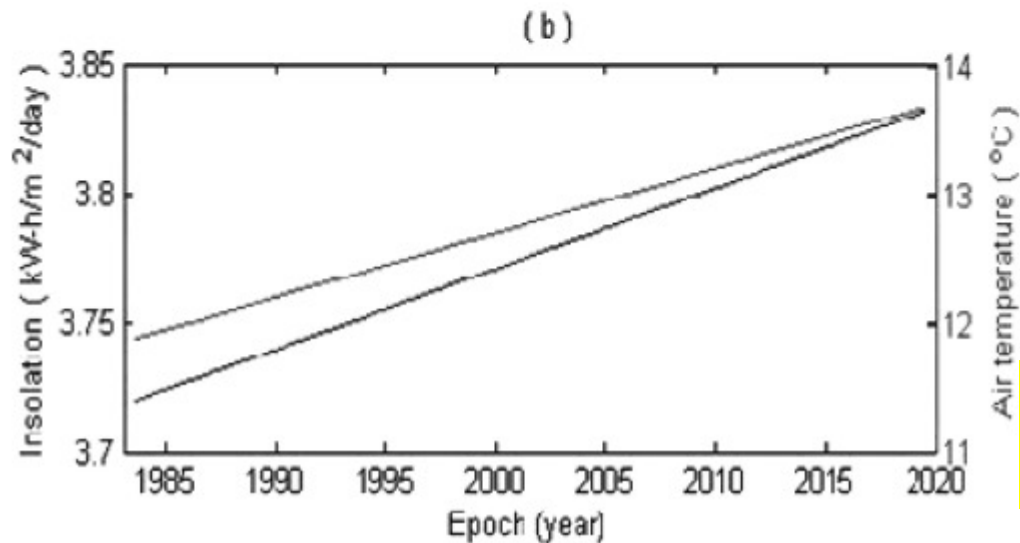


“Time series analysis of temperatures and insolation of the Earth’s surface at Kara-Dag using satellite observation”



Kara-Dag is a volcanic mountain in Crimea, on the shore of the Black Sea.

Top, insolation and resulting **ground temperature**, 1984-2020.



Bottom, Insolation and resulting **air temperature**, 1984-2020

The data and charts show the opposite; insolation is increasing.

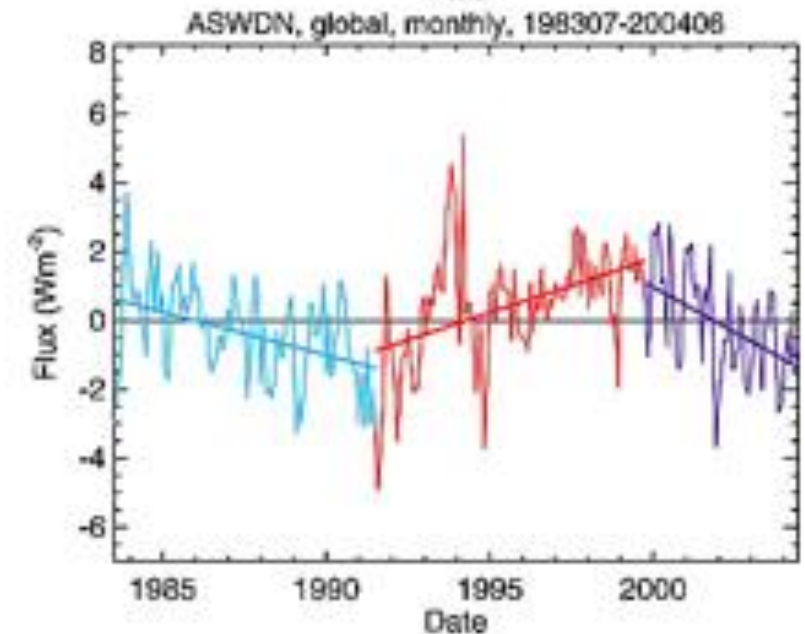
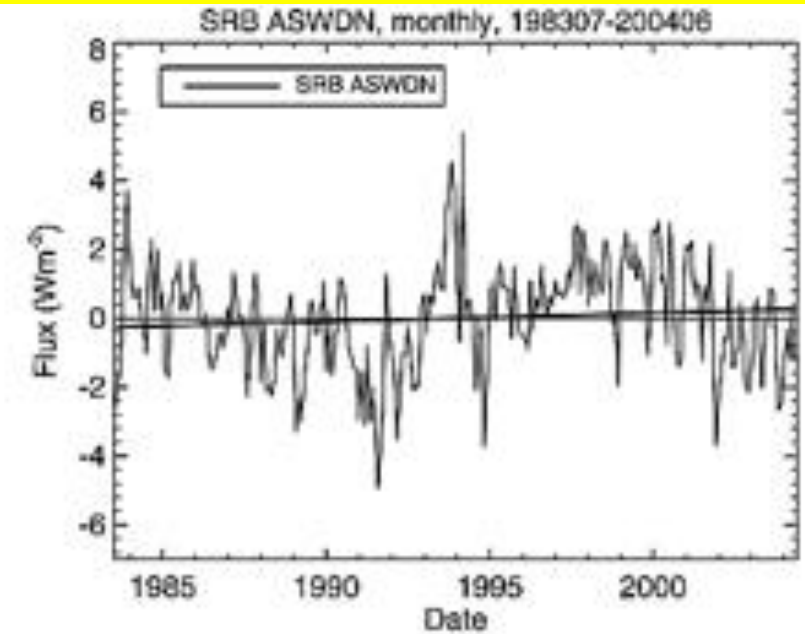
These data refute the notion that “light scattering particles are building up in the atmosphere.”

# Surface insolation trends from satellite and ground measurements: Comparisons and challenges

Journal of Geophysical Research: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2008JD011004>

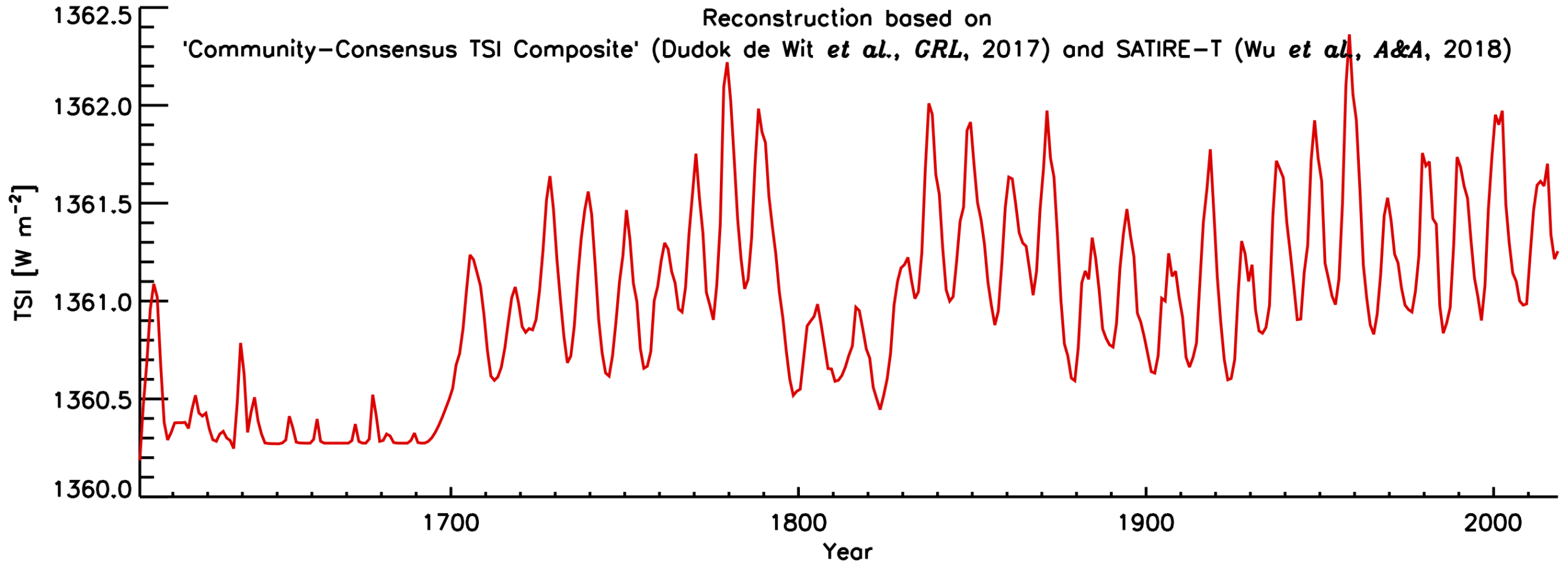
## Abstract

Global “dimming” and “brightening,” the decrease and subsequent increase in solar downwelling flux reaching the surface observed in many locations over the past several decades, and related issues are examined using satellite data from the NASA/Global Energy and Water Cycle Experiment (GEWEX) Surface Radiation Budget (SRB) product, version 2.8. A  $2.51 \text{ W m}^{-2} \text{ decade}^{-1}$  dimming is found between 1983 and 1991, followed by  $3.17 \text{ W m}^{-2} \text{ decade}^{-1}$  brightening from 1991 to 1999, returning to  $5.26 \text{ W m}^{-2} \text{ decade}^{-1}$  dimming over 1999–2004 in the SRB global mean. (Shortened)



### Historical TSI Reconstruction

Reconstruction based on  
'Community-Consensus TSI Composite' (Dudok de Wit *et al.*, *GRL*, 2017) and SATIRE-T (Wu *et al.*, *A&A*, 2018)





I found no data showing

*“global sunlight... is no longer reaching the surface of the Earth, caused by light scattering particles that are building up in the atmosphere.”*

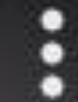
On the other hand...

There appear to be no empirical or measured data sets which agree with the notion that “Global Dimming” is ongoing.

The video revisits the Vietnam War weather modification effort in Laos in which I was an active participant



# The Dimming, Full Length Climate ...



GeoengineeringWatch.org

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4:16 / 1:56:51



HD

YouTube



“Weather was a weapon (we) used over Vietnam. Would you expect it to be deleted from the availability? NO! ....  
....to be available to your portfolio of weapons to be used, would be a natural process. Therefore, should you expect  
(us to have) the ability to change the weather on demand? ABSOLUTELY!”



# The Dimming, Full Length Climate ...



<All of these are my attempts to characterize the voice of the speaker, my best efforts>

GeoengineeringWatch.org



GeoengineeringWatch.org

Play (k)

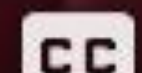
RICHARD H. ROELL

SUBSCRIBE

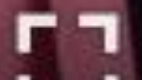
US AIR FORCE MAJOR GENERAL (RET.)



4:28 / 1:56:51



YouTube



The video uses Richard H. Roelleig, Maj. Gen., USAF, (Ret) to make the point that the USAF has in-being capability to resume the precipitation enhancement capabilities that we used over Laos from 1967-1972.

See: <https://casf.me/possible-lessons-from-weather-modification-operations-during-vietnam-war/>

Rolleig's notion is just false. The Operation was shut down down after it was compromised, and subject of intense Senate criticism. See Next.

The image shows a YouTube video player interface. At the top left, there is a circular profile picture of a man. The video title is "The Dimming, Full Length Climate ...". Below the title, there is a text box with the following text: "A CLASSIFIED RAINMAKING PROGRAM WAS CONDUCTED IN SEASIA FROM 1967 TO 1972 WHICH EMPLOYED AIR DROPPED SILVER AND LEAD IODIDE SEEDING UNITS TO INCREASE NORMAL MONSOON RAINFALL." To the right of the text box, there are two diagrams labeled A and B. Diagram A shows a cross-section of a cloud with an aircraft flying above it, dropping seeding units. Labels include "UPDRAFT", "DOWNDRAFT", "SEEDING", and "8°C". Diagram B shows a similar cross-section with labels "SEEDING PORTION" and "A". Below the diagrams, there is a "SUBSCRIBE" button. At the bottom of the player, there is a progress bar, a play button, a volume icon, a timestamp "4:21 / 1:56:51", a Creative Commons license icon, a gear icon with "HD", the YouTube logo, and a full screen icon. The "GeoengineeringWatch.org" logo is visible in the bottom left corner of the video frame.

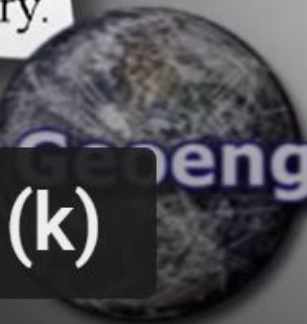


# The Dimming, Full Length Climate ...



In 2025, US aerospace forces can “own the weather” by capitalizing on emerging technologies and focusing development of those technologies to war-fighting applications.

From enhancing friendly operations or disrupting those of the enemy via small-scale tailoring of natural weather patterns to complete dominance of global communications and counterspace control, weather-modification offers the war fighter a wide-range of possible options to defeat or coerce an adversary.



GeoengineeringWatch.org

Play (k)

DANE WIGINGTON

SUBSCR

LEAD RESEARCHER

GEOENGINEERINGW



HD

Follow



5:02 / 1:56:51

The notion of **Owning The Weather** was enthusiastically championed by former US Army Chief of Staff Gen. Gordon Sullivan. (He was Col. Sullivan, VII Corps G-3 (Ops Officer, 1979-1981) when I was there)

When Air War College students proposed a USAF “**Own The Weather**” capability in 1996, including weather modification, to be available by 2025, the notion was disavowed by then USAF Chief of Staff General Michael E Ryan.

I could find no record of Gen Ryan’s words available today with Internet Search.

At the time, I was IMETS Technology Transition Team Leader at the Army Research Laboratory at WSMR. I tested, evaluated, and trained the software for the IMETS, Integrated Meteorological System, the Army Battle Command System to provide commanders and operators with high resolution “Battle Scale” weather & weather effects products.

IMETS was the Army’s Battle Command System to provide the Army its “**Own The Weather**” capability.

Today the notion of the US Military developing a capability to “**Own the Weather**” through environmental modification is actively trashed by many in the Think Tank World.

<https://www.globalresearch.ca/the-ultimate-weapon-of-mass-destruction-owning-the-weather-for-military-use-2/5306386>

<https://unbate.ngontinh24.com/article/does-the-us-military-own-the-weather-is-it-weaponizing-the-weather-as-an-instrument-of-modern-warfare-the-liberty-beacon>



# The Dimming, Full Length Climate ...



Mahmoud Ahmadinejad says Europe 'stealing Iran's rain'

Mahmoud Ahmadinejad has accused Western countries of plotting to "cause drought" in Iran by using high tech equipment to drain the clouds of raindrops.

## Iran drought part of 'soft war' by west: vice president

Monday, 16 July 2012

"Climate Engineering is the crown jewel of the military- industrial complex."

"We know that some of these countries have had their precipitation cut off because they have said so, on the floor of the UN."

GeoengineeringWatch.org



SUB



5:09 / 1:56:51



HD

Follow

I find it somewhere between amusing and absolutely astounding that Dean Wigginton uses the then-President Mahmoud Ahmadinejad of the Islamic Republic of Iran as a voice of authority, saying the United States cut off precipitation to Iran.

Wigginton: “We know that some of these countries have had their precipitation cut off because they have said so, on the floor of the UN.”

<https://abcnews.go.com/US/story?id=3642673>

Ahmadinejad: No Gays, No Oppression of Women in Iran  
Iranian president says country has no gays, no desire for nuclear weapons.

Current Events in 2022!

<https://time.com/6216513/mahsa-amini-iran-protests-police/>

Protests have intensified this week in Iran over the death of 22-year-old Mahsa Amini in police custody after she was arrested for allegedly wearing her headscarf too loosely. Amini died on Sept. 16 three days after her arrest in Tehran, and many Iranians are alleging that she was killed by law enforcement.



Dust, frequently composed of clay minerals, is transported vertically and horizontally, frequently trans-continently.

## Natural Processes frequently raise dust into the atmosphere.

**Dust Devils** raise dust to the top of the planetary boundary layer. This is the top of the “mixed layer,” the highest point sailplanes achieve in thermal soaring flight. I have gotten to 22,000 ft MSL soaring in thermals in New Mexico in June.

**Blowing Dust** raises huge amounts of dust well up into the atmosphere, during active windstorms. In New Mexico, Arizona and nearby, these frequently occur during the spring and often in conjunction with Tornado outbreaks.

We now know that these **blowing dust events bring trans-continental movement of dust plumes.**

In NH Summer, dust frequently moves from Africa to North and South America.

In NH Winter and Spring storms, Dust is transported from Asia across the Pacific to North America.

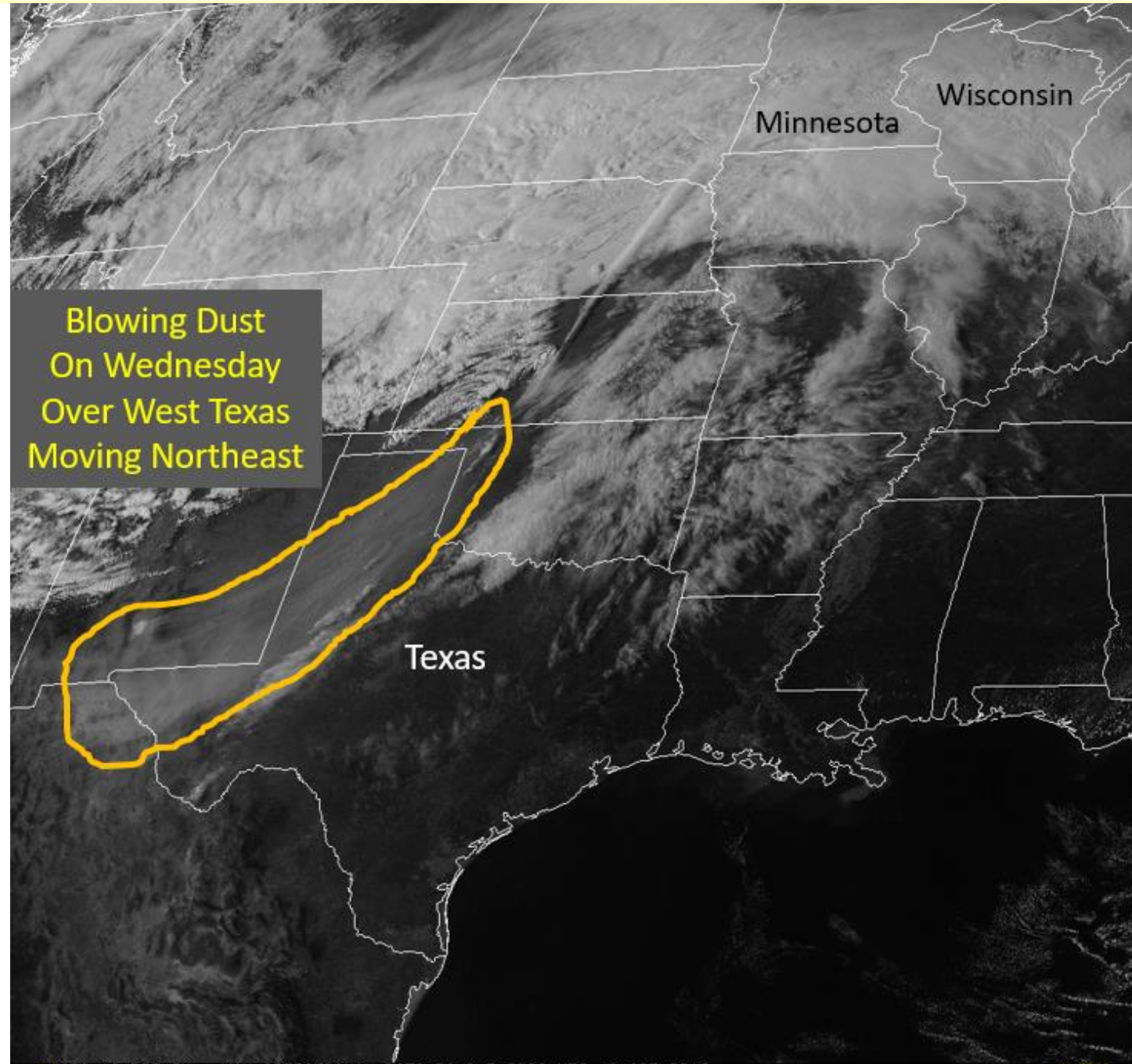




<https://www.lcsun-news.com/story/news/local/new-mexico/2017/04/21/state-warns-dust-storms-southern-new-mexico/100765560/>





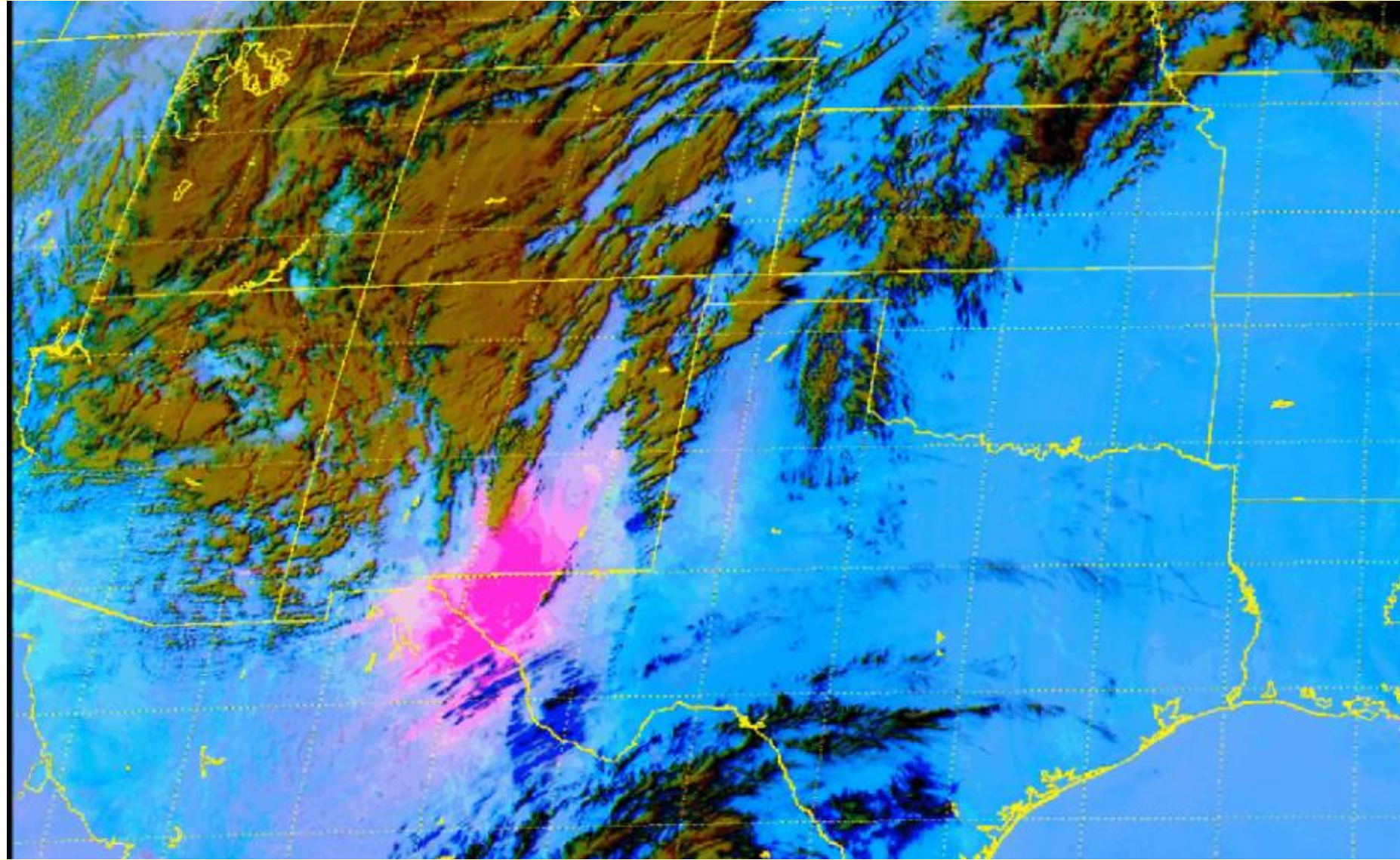


Blowing Dust  
On Wednesday  
Over West Texas  
Moving Northeast

Texas

Minnesota

Wisconsin

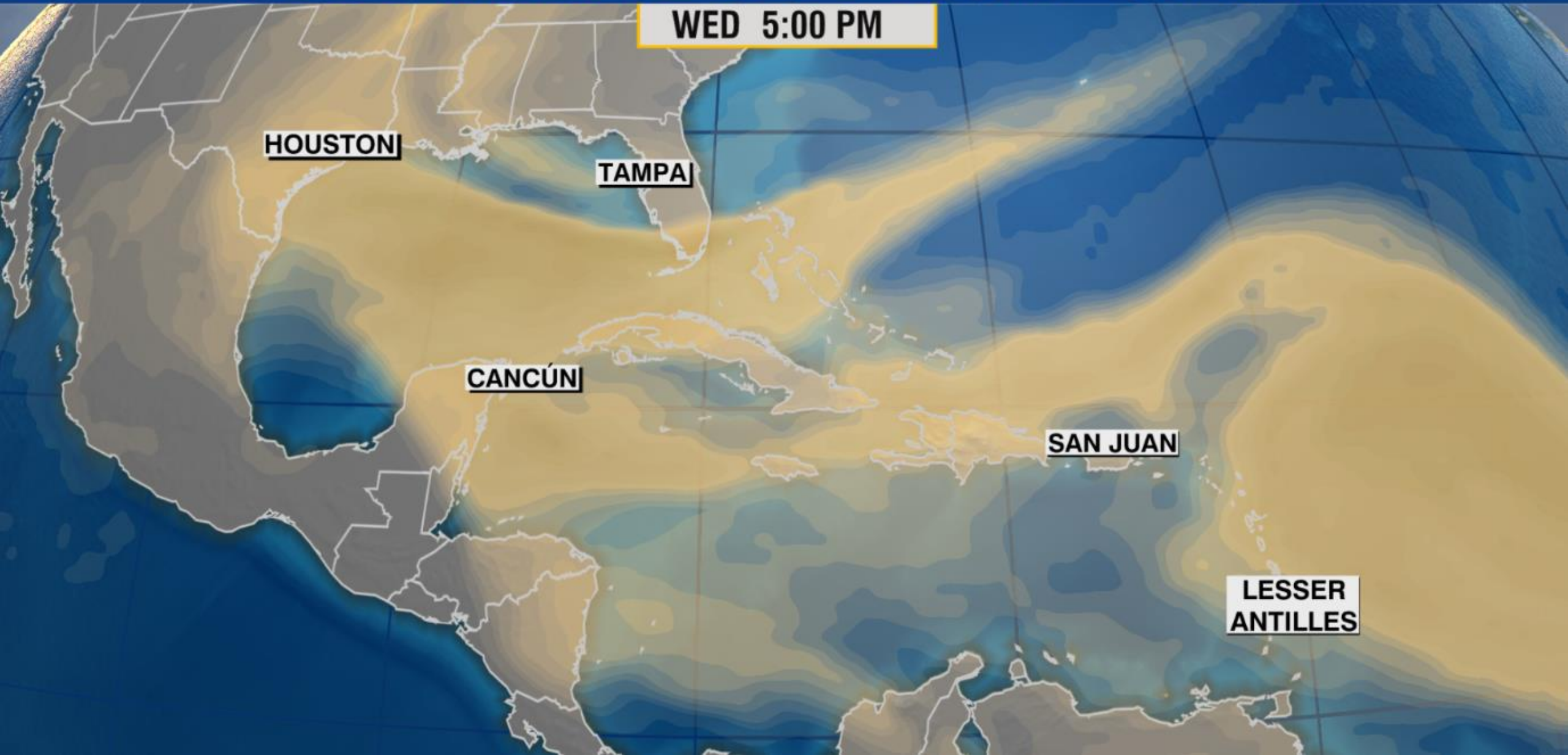


“...GOES-16 shows a large plume of dust from the desert southwest being dragged eastward, across northwestern Texas and east Oklahoma, by a front moving over the high plains in the early morning hours of March 24, 2017... the dust appears as magenta or pink...”



# SAHARAN DUST FORECAST

WED 5:00 PM



HOUSTON

TAMPA

CANCÚN

SAN JUAN

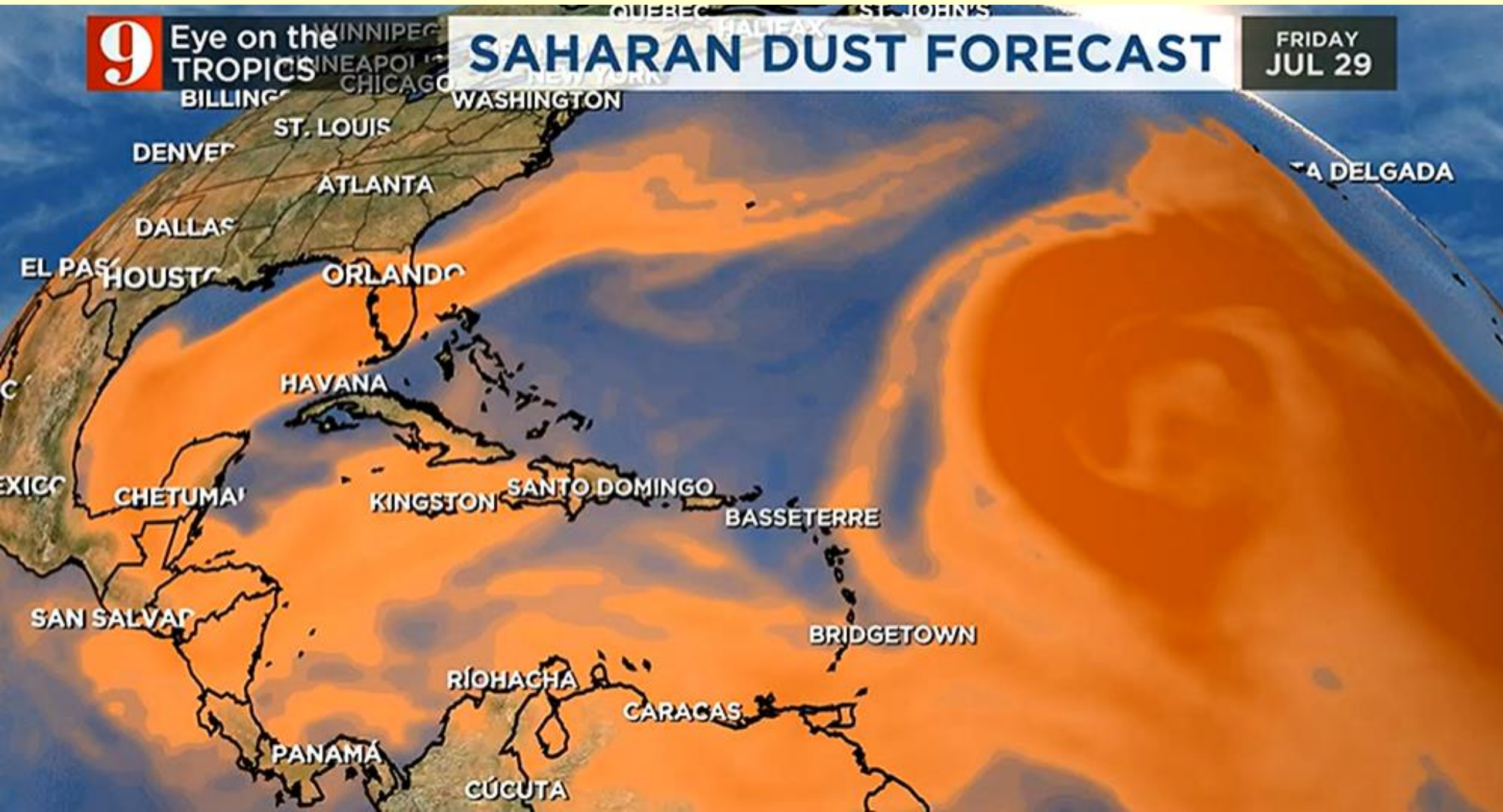
LESSER  
ANTILLES

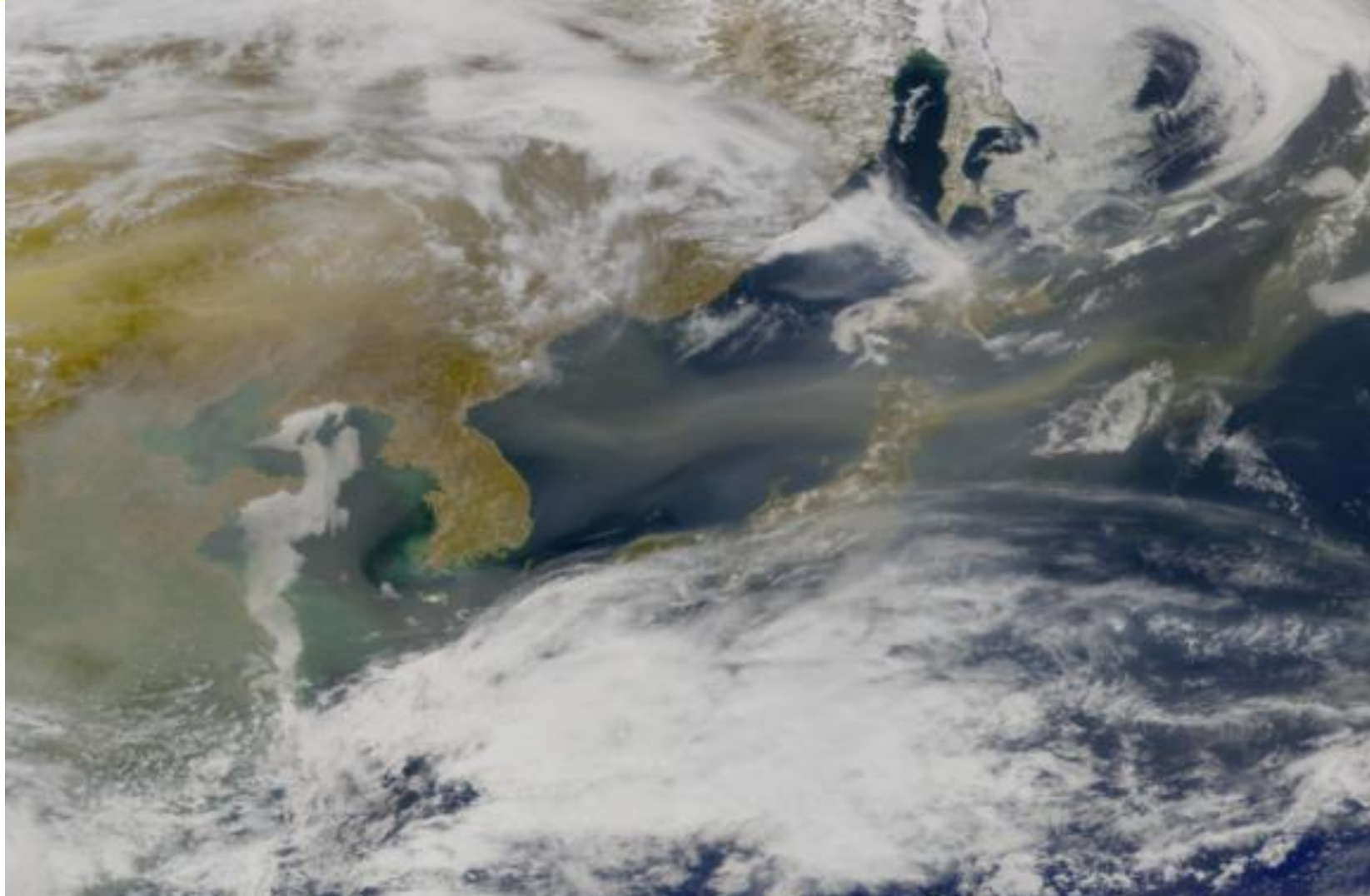
9

Eye on the  
TROPICS

# SAHARAN DUST FORECAST

FRIDAY  
JUL 29





“May 17, 2001 -- Springtime. Time for.....gargantuan trans-continental dust clouds! Scientists recently used NASA satellites to track a cloud of dust up to 2,000 km long as it left Asia, drifted across the Pacific Ocean, and traversed North America from Alaska to Florida, raining dust and possibly pollutants over the continent.”

## Another word from the Arabic, HABOOBS

During warm or hot seasons especially, thunderstorm outflow winds frequently bring blowing dust to dry or desert areas. These are not as widespread as the blowing dust episodes from strong winter and spring storms but do bring impressive images of walls of dust, whether viewed from the surface or from aloft.

They are called ***Haboobs***.

From *Wikipedia*:

1. When this downdraft of cold air, or downburst, reaches the ground, it blows dry, loose silt and clay (collectively, dust) up from the desert, creating a wall of airborne sediment that precedes the storm cloud.

This wall of dust can be up to 100 km (62 mi) wide and several kilometers in elevation. At their strongest, haboob winds often travel at 35–100 km/h (22–62 mph), and they may approach with little or no warning.

<https://www.azcentral.com/story/news/local/arizona/2020/03/09/whats-haboob-definition-arizona-lexicon/4928664002/>





<https://www.mesacc.edu/sites/default/files/pages/section/academicdepartments/culturalscience/meteorology/images/haboob-pielage.jpg>







Pinterest

<https://www.pinterest.com/pin/425730970997234499>

**PHOTOS: Massive Haboob Barrels Through Western Texas | Dust storm,  
Aerial view, Aerial photo**



“We were able to test at altitude, to confirm the elements that were showing up at the surface....”  
... (Speaking of the NOAA flying lab) “We sampled below the cloud layer, we sampled in the (*inaudible, presumably cloud*) layer, and above the cloud layer.”

“We found exactly the same elements that we found at countless surface measurements from precipitation we found all over the globe.”

[54] STRATOSPHERIC WELSBACH SEEDING  
FOR REDUCTION OF GLOBAL WARMING

<All of these are my attempts to characterize the voice of the speaker, my best efforts>

For example, aluminum oxide ( $\text{Al}_2\text{O}_3$ ) is one metal oxide suitable for the purpose and which is relatively inexpensive.

GeoengineeringWatch.org

DANE WIGINGTON [SUBSCRIBE](#)

LEAD RESEARCHER

GEOENGINEERINGWATCH.ORG



7:57 / 1:56:51



HD

YouTube



(From Slide 76)

“...it (the haboob) blows dry, loose silt **and clay** (collectively, dust) up from the desert, creating a wall of airborne sediment that precedes the storm cloud.” (bold added)

Kaolin is a common component of ordinary clay, which forms from the weathering of rocks, especially in hot, humid conditions. The most common mineral in kaolin is **Kaolinite**

Let's look at <https://en.wikipedia.org/wiki/Kaolinite>

“The chemical formula for kaolinite as used in mineralogy is  $\text{Al}_2\text{Si}_2\text{O}_5(\text{OH})_4$ , however, in ceramics applications the formula is typically written in terms of oxides, thus the formula for kaolinite is  **$\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2 \cdot 2\text{H}_2\text{O}$** .” (Bold added)

That Geoengineering Watch finds Aluminum Oxide ( $\text{Al}_2\text{O}_3$ ) in the environment as indication that there is harmful geoengineering on-going seems ignorant of the chemical composition of blowing dust we see in dry environments, common here, and in many continental interiors.

We see clay minerals in the air when weathered rock is exposed to strong winds, such as the spring winds we have in the Desert Southwest. Kaolinite is the substance which gives rain the earthy smell when it first rains, or in light rain showers out here in the desert.

Often, when we examine a rock, say by picking it up and breathing on it, that earthy smell from the complex clay minerals released from the rock is observed.

“We were able to test at altitude, to confirm the elements that were showing up at the surface....”  
 (Speaking of the NOAA flying lab) “We sampled below the cloud layer, we sampled in the (inaudible) layer, and above the cloud layer.”  
 “We found exactly the same elements that we found at countless surface measurements from precipitation we found all over the globe.”

Note the Barium Sample

## PRECIPITATION TESTS

# The Dimming, Full Length Climate

**SAN FRANCISCO, CA**

Sample ID	Matrix	Extraction Type	Aluminum	Barium	Strontium
San Francisco, CA	W	TOTAL	620	95	59

**SACRAMENTO, CA**

Aluminum	4700
Barium	64
Strontium	44

**CHICO, CA**

Metals - Total		
Analyte	Units	Results
Aluminum	ug/l	95.7
Barium	"	4.8
Lithium	"	ND
Strontium	"	13.3

**REDDING, CA**

Analyte	Units	Results
610 ALDER STREET Water (9031049-01)		Sampled:03/22/09
Aluminum	ug/l	41
736 PINE RIDGE AVENUE Water (9031049-02)		Sampled:03/21/09
Aluminum	ug/l	853
SHASTICE PARK Water (9031049-03)		Sampled:03/21/09
Aluminum	ug/l	1540

**BELLA VISTA, CA**

Metals - TTLC				
Analyte	Units	Results	Qualifier	MDL
OUTSIDE OF CLASSROOM (3-4&5) Wipe (9120210-01)				Sampled:11/25/09
Aluminum	mg/kg	191	QM-4X	10000
Barium	"	3.2	J, QM-05	0.8

**WELL WATER RINSED OVER DIRTY SOLAR PANELS Water (2050830-01)** Sampled:05/16/12

Aluminum	ug/l	52000	50	250
Barium	"	410	5	25
Strontium	"	4.3	5	25

**Aluminum Content in Chico-Area Water Sources** in parts per billion — Samples should average less than 1 ppb

**GeoengineeringWatch.org**

8:00 / 56:51

# Barite Resources of the United States

By DONALD A. BROBST

(Report published in 1958)

MINERAL RESOURCES OF THE UNITED STATES

---

GEOLOGICAL SURVEY BULLETIN 1072-B

*A study of the production and use of ore,  
geochemistry and geology of the deposits,  
with consideration of mining methods  
and exploration, and estimates of reserves*



(Formatted to improve readability)

MINERAL RESOURCES OF THE UNITED STATES  
BARITE RESOURCES OF THE UNITED STATES  
By DONALD A. BROBST

ABSTRACT

Barite ( $\text{BaSO}_4$ ) is widely distributed in the United States; the greatest production is now obtained from Arkansas, Missouri, Nevada, and Georgia.

Nearly-half of the States have yielded some barite or have potential resources.

Since World War I domestic production has climbed steadily, reaching more than one million tons in 1956.

About 90 percent of the barite consumed annually in the United States is used by the oil industry for drilling mud and the other 10 percent by the chemical and other industries in many processes and products.

## ABSTRACT, Cont'd

Barite is a desirable industrial mineral, because it is generally white in powder form, **heavy, mainly nonabrasive, and available in large quantities.**

Vein or cavity-filling deposits are commercially most important in the West....

Rare-earth, gold, and silver minerals are associated with some western deposits.

Some of the associated minerals may be recovered as byproducts or coproducts.

Bedded deposits of commercial importance are found in Arkansas, Nevada, Idaho, and California in sedimentary rocks of late Paleozoic age.

The barite is fine grained and accompanied by chert, pyrite, secondary iron oxides, and various carbonate and clay minerals.

Definition: “ ...residual deposits are the insoluble products of rock weathering which have escaped distribution by transporting agencies, and which still mantle the rocks from which they have been derived.

Bob definition: residual deposits are minerals which have been left over after the exposed rock has been weathered and washed away, and remains atop the remaining exposed deposit”

### ABSTRACT, cont'd

Residual deposits are abundant in Georgia, Tennessee, Virginia, and Missouri, where they generally occur in the residuum derived from the weathering of sedimentary rocks, especially the readily soluble limestones of Cambrian and Ordovician age.

Most of the barite is white and forms mammillary, fibrous, or dense, fine-grained masses.

Pyrite, galena, and sphalerite occur with barite in some deposits.

Chert, rock fragments, and **red, yellow, or brown clay** make up the rest of the deposits. (Bold added)

# SACRAMENTO, CA

Aluminium	4700
Barium	64
Strontium	44

At the 7:59 mark: In addition to aluminum compounds, (Aluminum's atomic number is 13) the video lists barium, whose atomic number is 56. The common barium mineral is Barite, now Baryte; it is quite heavy.

“Worldwide, 69–77% of baryte is used as a weighting agent for drilling fluids in oil and gas exploration to suppress high formation pressures and prevent blowouts. As a well is drilled, the bit passes through various formations, each with different characteristics. The deeper the hole, the more baryte is needed as a percentage of the total mud mix. An additional benefit of baryte is that it is non-magnetic and thus does not interfere with magnetic measurements taken in the borehole, either during logging-while-drilling or in separate drill hole logging.”



Geoengineering Watch finds the presence of Barium troubling, but commonly barium is found as Baryte, BaSO<sub>4</sub>.

From Wikipedia, <https://en.wikipedia.org/wiki/Baryte>

“Although baryte contains the toxic alkaline earth metal barium, it is not detrimental for human health, animals, plants and the environment because barium sulfate is extremely insoluble in water.”

Baryte is commonly found in shallow clay and mud deposits formed by the weathering of limestone. [barite | mineral | Britannica](#)

Baryte is the principal component of drilling mud poured down wells to keep high pressure gas and crude oil from blowing out.

Drilling mud is the light-colored mud found around almost all drilling sites.

When ordinary mud or drilling mud dries out and it gets windy, or a dust devil passes, the barite becomes airborne, to fall out when atmospheric turbulence subsides, or captured by rain droplets or drops.

## ANALYSIS

Geoengineering Watch is alarmed over the presence of finding  $Al_2O_3$ , a common hydro-alumino-silicate found in Clay and Kaolinite, above and below the clouds, and at the surface.

That clay and kaolinite, components of common blowing dust, which is observed being transported regionally and trans-continently, and which can and does fall out to the surface has never occurred to them.

Remember, although Geoengineering Watch claims small solid particles are accumulating in the atmosphere, measurements show this is not occurring, or at least has not been commonly observed, and the opposite was found in Crimea.

*Have they never cleaned their car windshields after leaving their vehicle outside overnight and examined the crud on the paper towels?*

From a previous page, this quote:

“When ordinary mud or drilling mud dries out and it gets windy, or a dust devil passes, the barite becomes airborne, to fall out when atmospheric turbulence subsides, or when captured by rain droplets or drops.”



SACRAMENTO, CA	
Aluminum	4700
Barium	64
Strontium	44

and to repeat a previous thought...

That Baryte, another component of common blowing dust, which is observed being transported regionally and trans-continently, can and does fall out to the surface...

...this thought has never occurred to Geoengineering Watch.

Mountain Wave Clouds frequently are indicators of vertical motions in stable atmospheres when lifting brings the air to saturation.

# El Paso radiosonde (sounding) balloon plot

<http://weather.rap.ucar.edu/upper/epz.gif>

2 Dec 2018 1200Z or 0500 MST

**Mountain Wave**  
Conditions: Stable Layer  
Wind Component 25 Kts  
normal to Ridge Top  
Winds incr. w/height

Skew-T log P diagram.

Blue horizontal lines are equal pressure, highest pressure at the surface, decreases with height logarithmically, like in atmosphere. Red line is temperature sounding, Green line is dewpoint sounding, the measure of water vapor

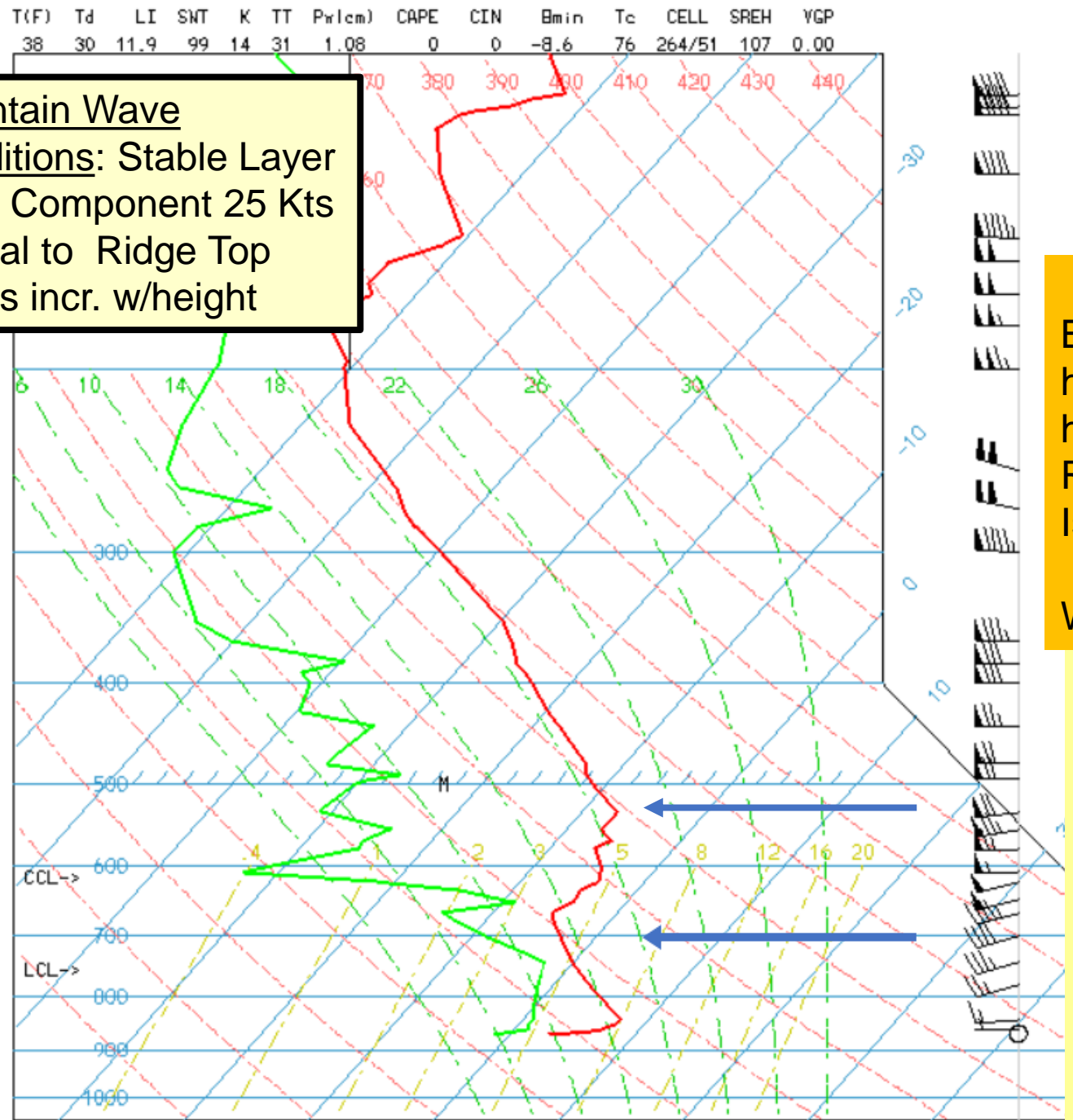
Wind barb vectors are to the right

Cold Stable Air Mass 700 to 520 millibars, between Blue arrows.

Mountain ridge tops are about 10,000 ft MSL or 700 millibars, with winds from 250 at 40 knots.

Winds increase with height, from 270 degrees At 70 knots at 500 mb about 18,000 ft

Max winds from 275 degrees at 200 mb 39,000 ft



**STABLE AIR ALOFT**

**DOWNWARD MOVING AIR**

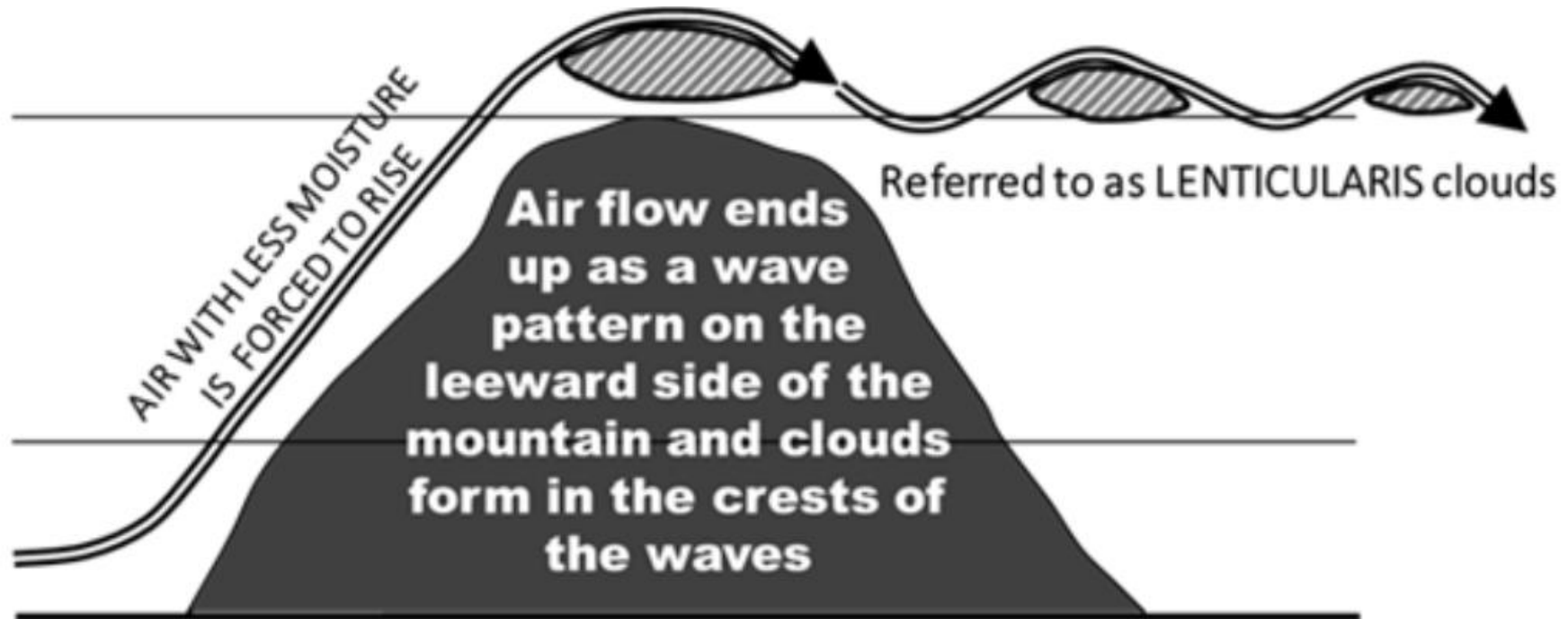
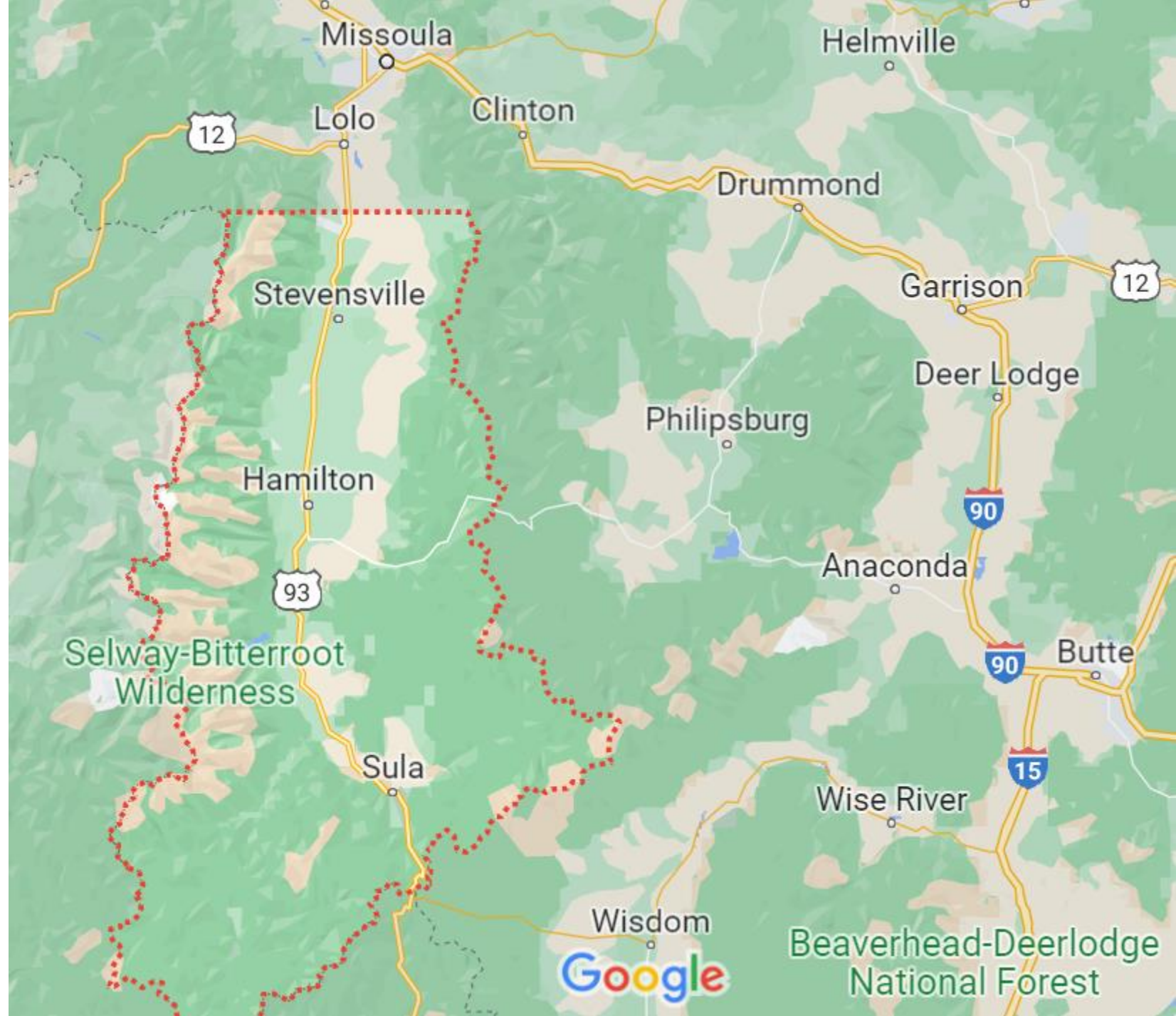




Photo was shot in the  
Bitterroot Valley Montana,

South of Stevensville, north  
of Hamilton.

After mid day, looking south  
from the light and shadows  
visible.







# MONTANA



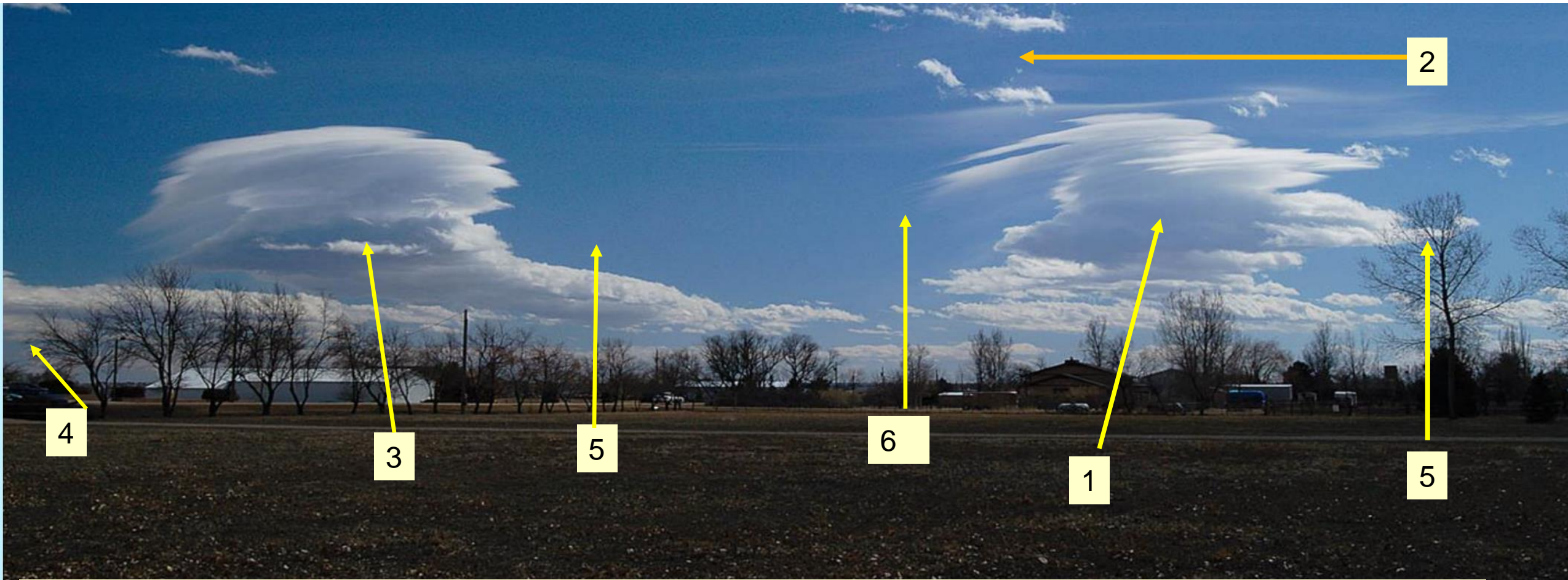
IDAHO

MONTANA

Helena

Granite Peak  
3901

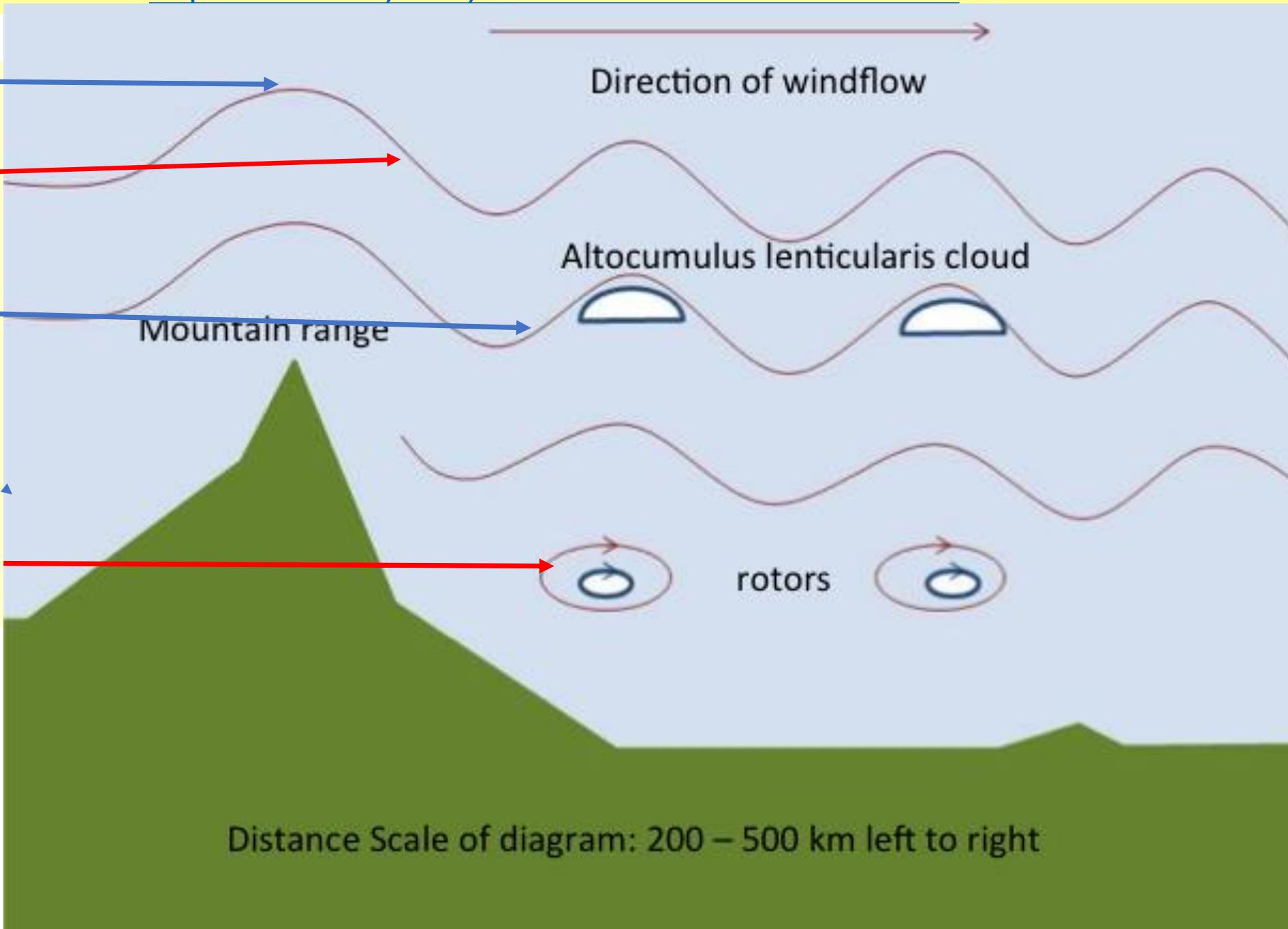
www.newworldmaps.net



Bob interpretation, based on email from Kurt Kleiner. Photo from Bitterroot Valley looking south. Bitterroot mountains well to the right and not visible in this picture, foreground in flat valley land.

- |   |   |
|---|---|
| 1. Primary Wave, in the lee of the Bitterroot Range | 4. Sapphire Mts, E side of Valley, own wave structure |
| 2. Strong Winds Aloft from the west.                | 5. Strong Lift Area                                   |
| 3. Secondary Wave, long wave extending south        | 6. Strong Sink Area                                   |

No lift  
Strong Sink!  
Strongest Lift  
ahead of the  
cloud  
Rotor!  
Severe  
to Extreme  
Turbulence  
possible



Distance Scale of diagram: 200 – 500 km left to right



The purpose here is to show that frequently there is a sharp edge to the lenticular clouds

Image I shot in Las Cruces, NM in February 2017.

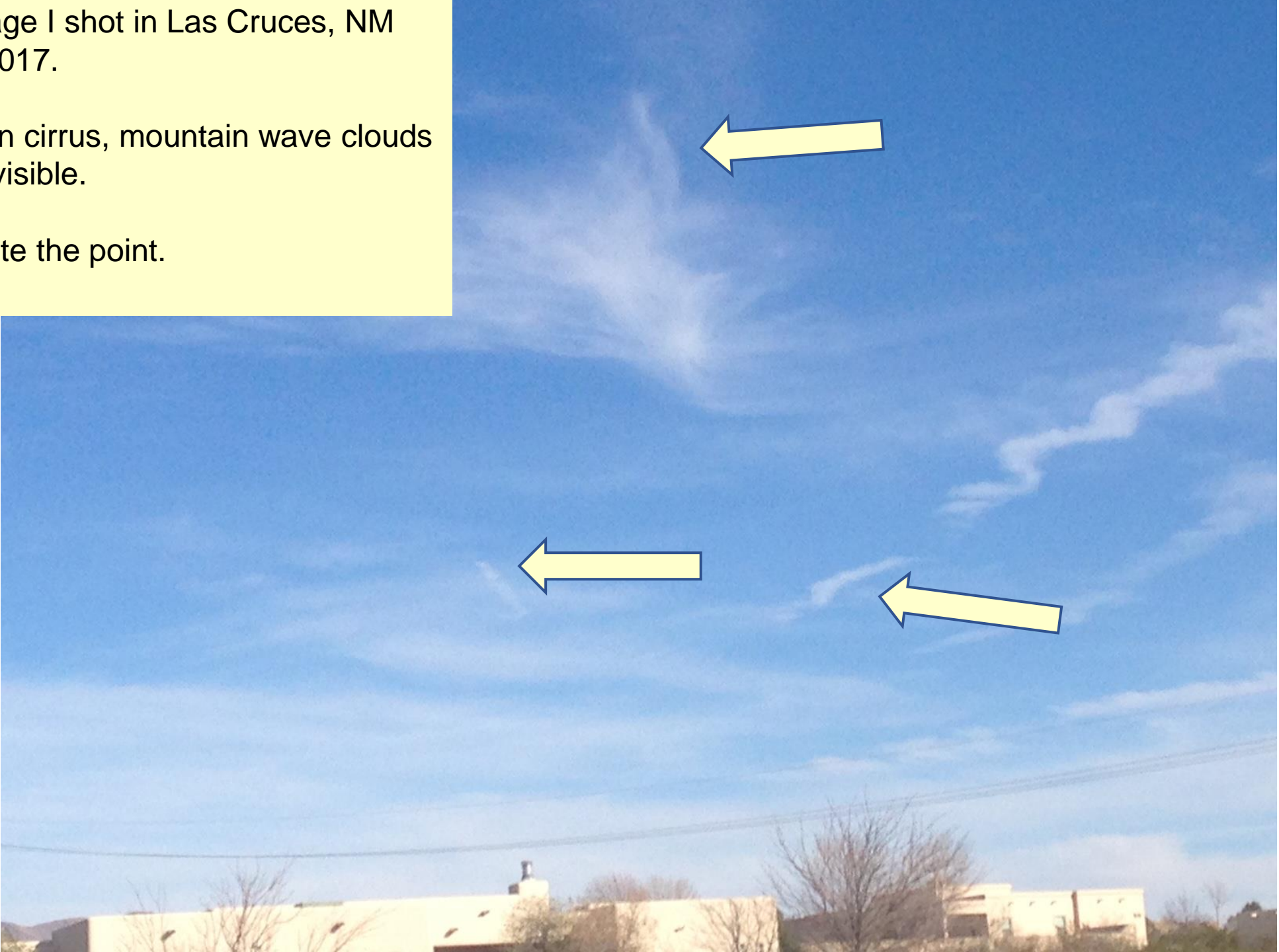
There are plain cirrus, mountain wave clouds and contrails visible.



The same image I shot in Las Cruces, NM  
in February 2017.

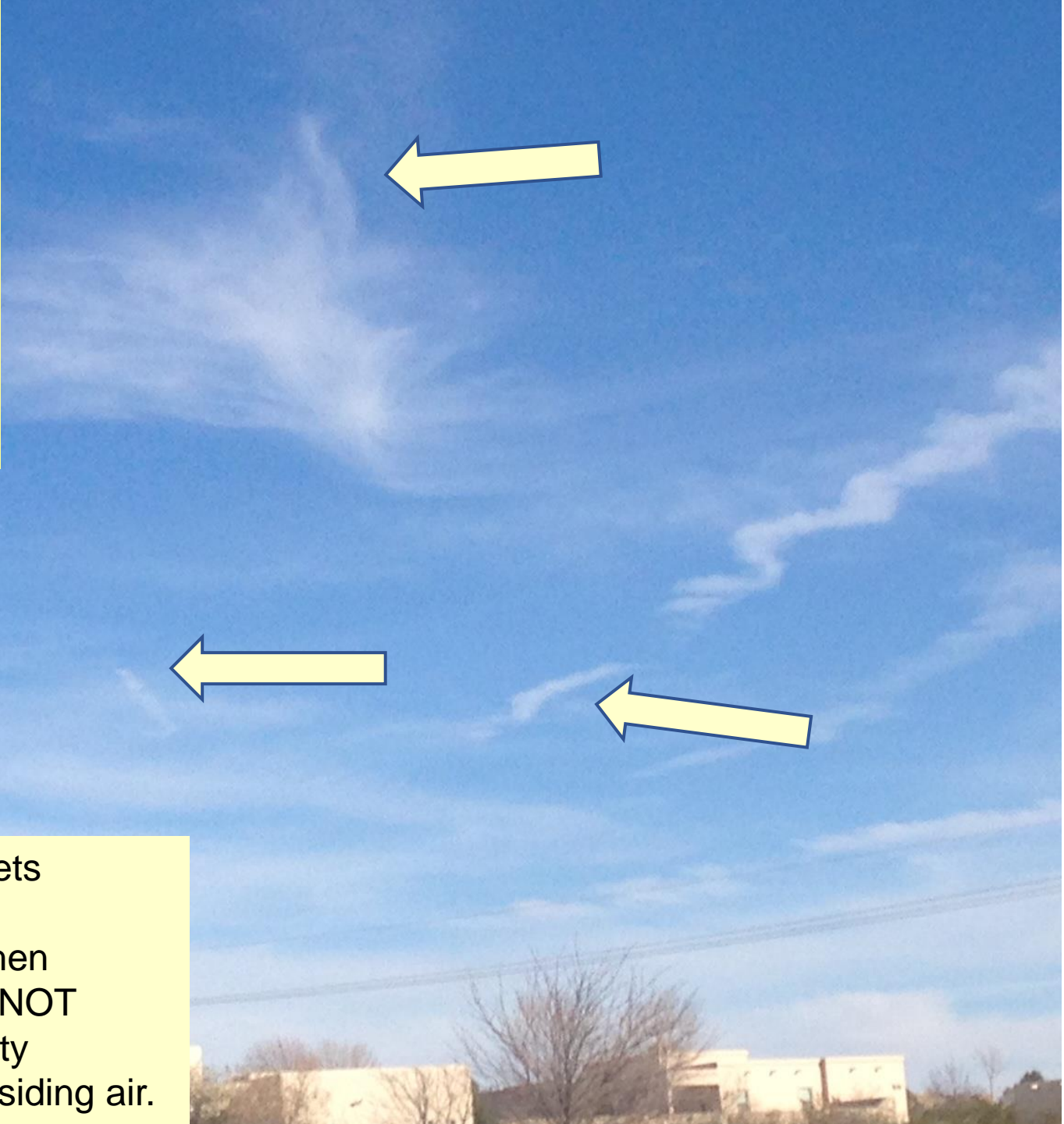
There are plain cirrus, mountain wave clouds  
and contrails visible.

Arrows illustrate the point.



Arrows point to discontinuous contrails. Note these contrails appear ONLY in the vicinity of other cirrus clouds.

The contrails disappear in the blue sky, where there are no cirrus clouds, because the air is subsiding in the blue-sky region.



This shows that the exhaust from the jets are contrails, not chemtrails, because the water substance forms contrails when the relative humidity is high, and does NOT form contrails when the relative humidity is low, which is what happens with subsiding air.





Another instance where there are sharp-edged contrails, dense near clouds, presumably with ascending air, and no contrails or clouds with descending air and deeper blue cloud-free air.



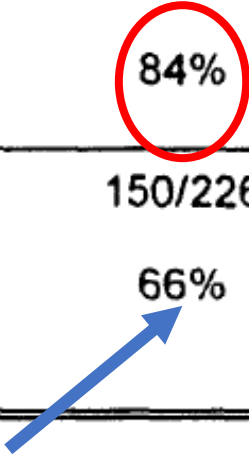
# Table 1 AWSTR 93-001

**TABLE 1. Contrail Formation Sensitivity to Vertical Motion.** As shown, the chances for contrail formation increase drastically when upward motion occurs in either of the three temperature categories.

	$-39^{\circ} \leq T \leq -30^{\circ}$	$-49^{\circ} \leq T \leq -40^{\circ}C$	$T \leq -50^{\circ}C$
Upward Motion and Occurrence	126	381	185
Upward Motion and Non-Occurrence	640	338	36
Downward Motion and Occurrence	43	142	150
Downward Motion and Non-Occurrence	563	652	226
Upward Motion and Occurrence/Total OBS with Upward Motion	126/766 16%	381/719 53%	185/221 84%
Downward Motion and Occurrence/Total OBS with Downward Motion	43/606 7%	142/794 18%	150/226 66%

When atmospheric vertical motion is positive, the chances of contrail formation “drastically” improve, Red circle.

When atmospheric vertical motion is negative, the chances of contrail formation decreases. Blue arrow.



# Summary

- “The Dimming” is a well-produced 2-hour video bringing the message that our weather and climate is being geoengineered to decrease the amount of solar radiation accumulating aerosols in the air.
- Geoengineering Watch is sadly ignorant of many basics of Chemistry, Geochemistry, Atmospheric Fluid Dynamics and Thermodynamics. They can't/won't find easily searchable explanatory info.
- Errors: Not understanding the Chemistry of Combustion and the enormous amounts of water liberated in combustion engines. Geochemistry of weathered rocks, yielding clays, dried, and blown to great heights, transcontinental distances explains their observing minerals aloft and at the surface.
- For decades, military forecasters have used empirical in-flight data collected from contrail and no-contrail observations, compared with radiosonde data, to achieve good predictive capabilities for contrail appearances for Military Advantage in Flight.
- If air is stable, and humid enough, mountain waves of various wavelengths can show areas of positive & negative atmospheric motion. Rising air cools, water condenses, becomes visible droplets or ice crystals.
- The sudden appearance and disappearance of supposed Chemtrails are only Contrails whose appearance and disappearance are governed by vertical motions of the atmosphere.

