

**Water was the cradle and
mother of all life**

When the world is too hot

**it is also the destructor that
erases life**

Lethal Humidity:

Damage and destruction in Derna Libya

a 9/11 event in the climate crisis

Dr William Hall (PhD)
Climate Sentinel News
[@VoteClimateOne.org](https://VoteClimateOne.org)

- We're in an existential climate crisis!
- It's unreal to most people and we don't know what to do about it
- If we can make it real, then we can start thinking seriously
- **The events that happened overnight 10-11 Sept. In the Libyan city of Derna makes the unimaginable real**
- **Between midnight and dawn what Andrew Forrest calls "lethal humidity" *erased* more than 20% of its material structure and more than 10% of its population of 100,000 people**
- **If we can accept the reality, we can better think about what to do**

Floods tear through Libyan city of Derna



Three themes to think about

1. What does the unimaginable reality of our changing climate tell us about our possible / plausible futures?
(*DIRE SITUATION — EXTINCTION IS POSSIBLE!*)
2. What can/must we do to maximize our the chances for better outcomes?
3. The technological explosion that makes this presentation even possible gives reason to be optimistic that we actually solve the climate crisis before it is too late!

75% on the reality of Derna

25% on how @VoteClimateOnethinks we can do in response to the message from Derna

STORM DANIEL

World Meteorological Organization - 12/09/2023

Storm Daniel leads to extreme rain and floods in Mediterranean, heavy loss of life in Libya

As the planet warms, the expectation is that we will see more extreme rainfall events, leading to more severe flooding.

"A warmer atmosphere can hold more moisture. Therefore, precipitation events – with rain, snow or hail – in a warmer climate are more intense and can lead to more flooding," says Stefan Uhlenbrook, Director of Hydrology and Cryosphere at WMO. **"More than 80% of the moisture in clouds originates from the oceans, even more in tropical cyclones. This means that increasingly warmer oceans will fuel storms further,"** he says.

Sea surface temperatures above 26 °C can enhance and fuel such storms after they develop. Near the coast of Libya, sea surface temperatures were above 27.5 °C, thus increasing the energy available for the convection and moisture.

...

Storm Daniel developed in Greece and was named by the Hellenic National Meteorological Service. As it moved towards Libya, Storm Daniel developed the characteristics of a Medicane - MEDiterranean hurriCANE. This hybrid phenomenon shows some characteristics of a tropical cyclone and others of a mid-latitude storm. Activity historically peaks between September and January.

Storm Daniel caused record-breaking rainfall in Greece on 5-6 September, with a reported 750 mm falling in 24 hours at a station in the village of Zagora. This is the equivalent of about 18 months of rainfall. **In Thessaly, central Greece, many stations received 400 to 600 mm of rainfall in 24 hours. Thessaly is Greece's agricultural heartland, and so the economic impacts are expected to be serious.**

There were a number of fatalities. Many people sought refuge on rooftops.

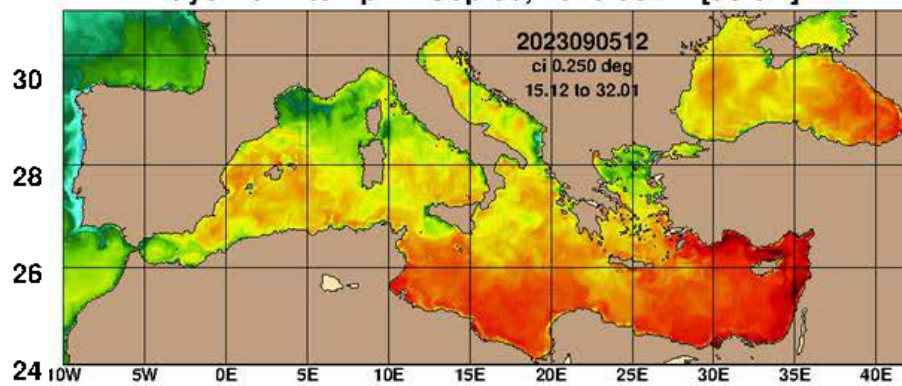
Concurrently, Greece was battling Europe's biggest ever wildfire, which caused massive destruction in the northeast of the country.

Mediterranean sea surface temperatures 6/09/2023 – 11/09/2023

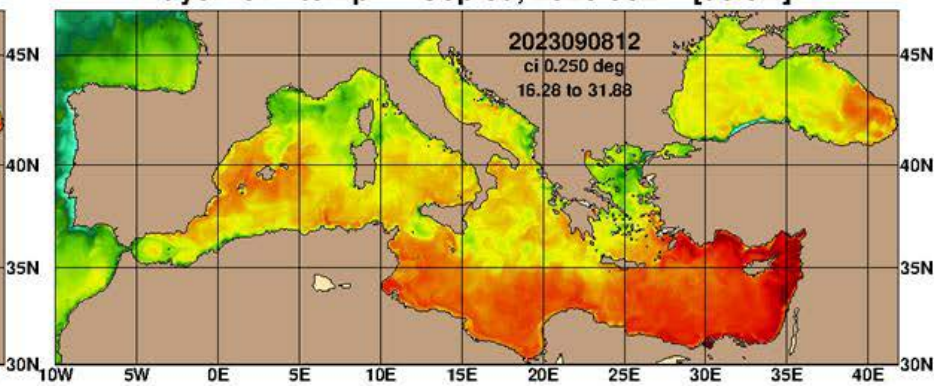
GOFS 3.1

[Hindcasts](#) leading up to Real-time 1/12° Global HYCOM+CICE Nowcast/Forecast System (US Navy)

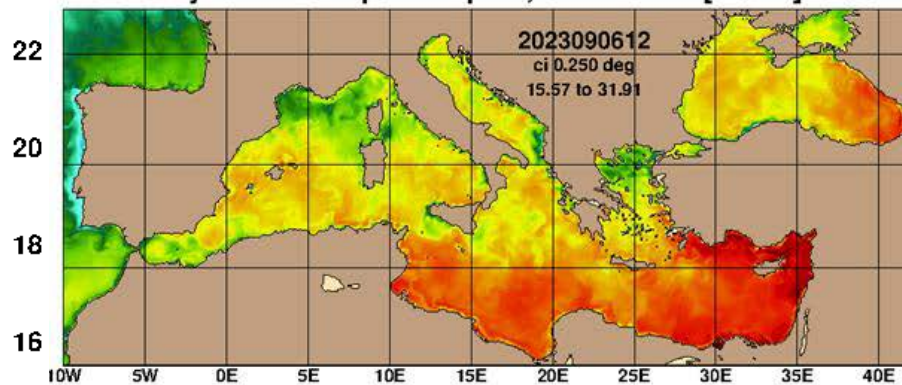
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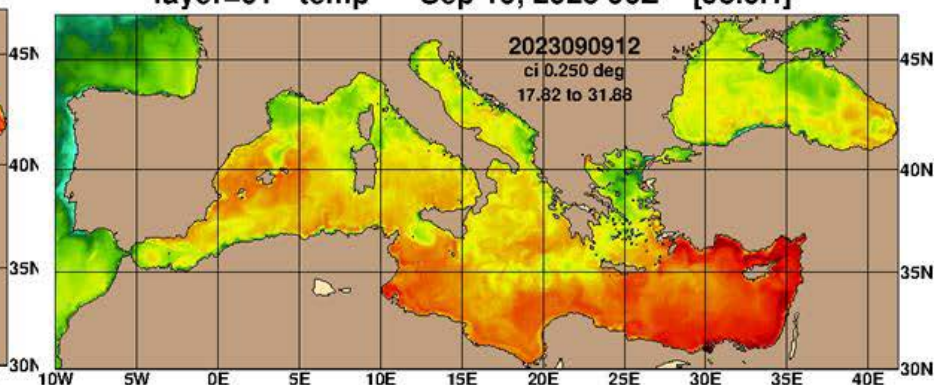
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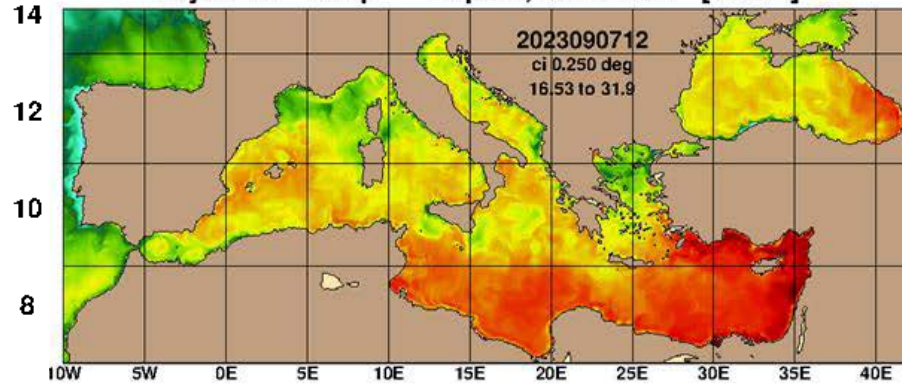
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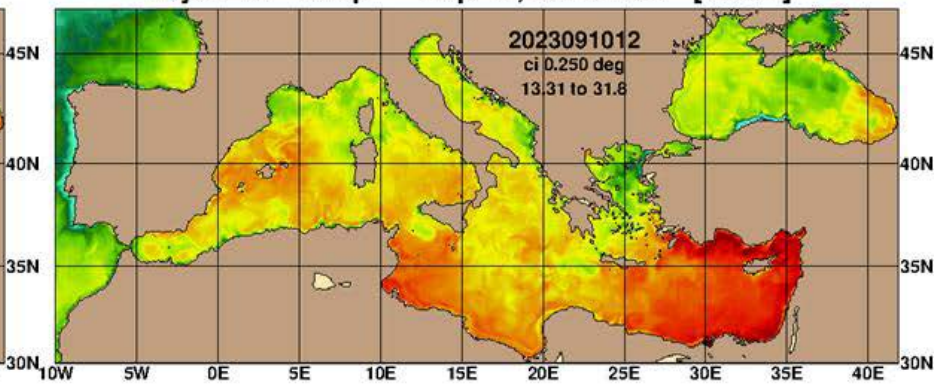
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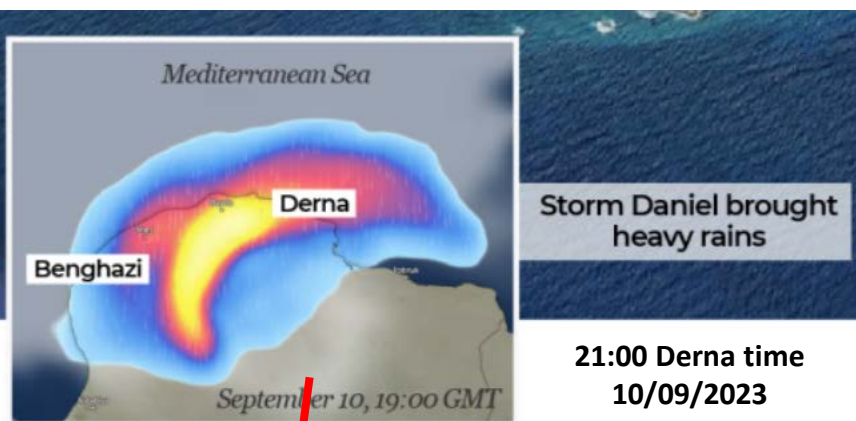


layer=01 temp Sep 08, 2023 00Z [93.0H]



layer=01 temp Sep 11, 2023 00Z [93.0H]





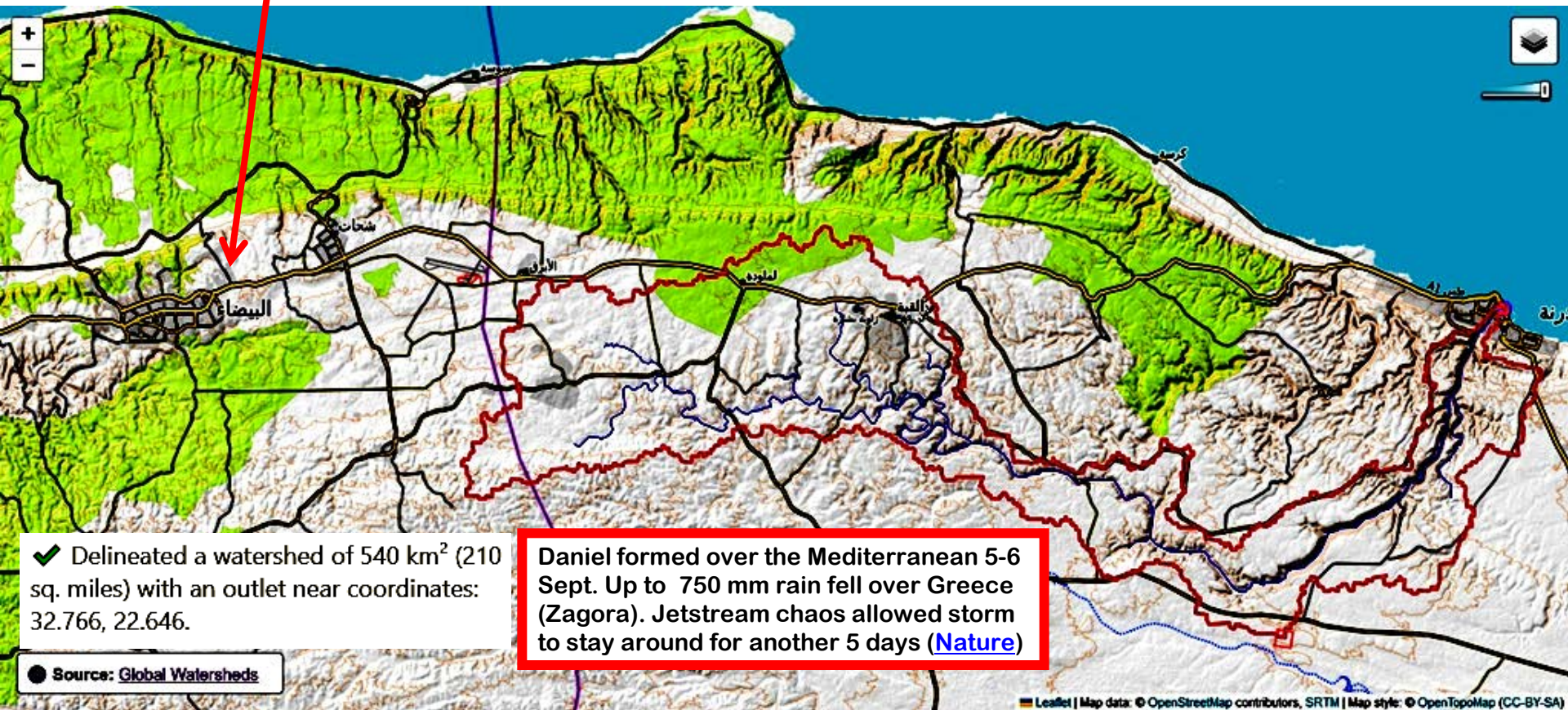
21:00 Derna time
10/09/2023

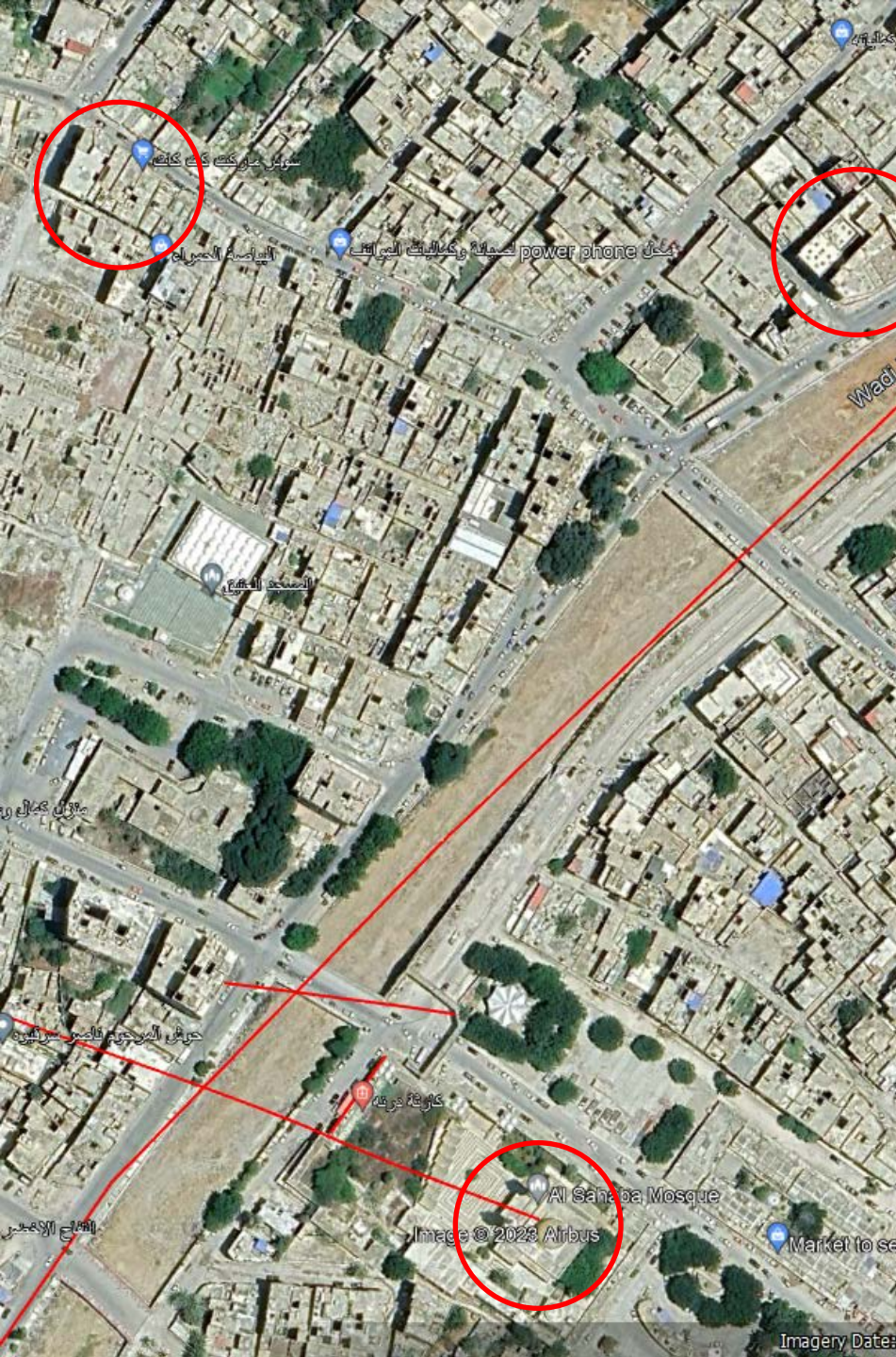
Major rain would have fallen in upper watershed after midnight as water was squeezed out of rising hot and humid Mediterranean air masses sweeping in from the west.

Al Bayda, just west of the Derna watershed, reported a 24 hour total of 414 mm !)




Source: Google Earth, Zoom.earth | September 13, 2023

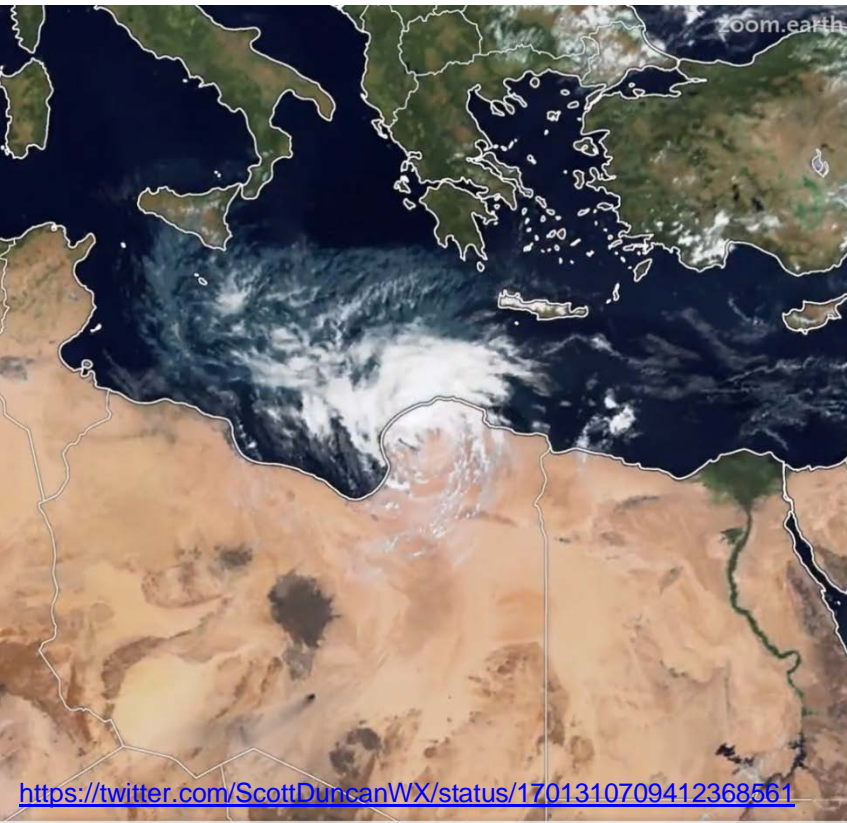
Map of the Wadi Derna watershed. Source: Global Watersheds: <https://mghydro.com/watersheds/shared/BE4508.html>





LETHAL HUMIDITY

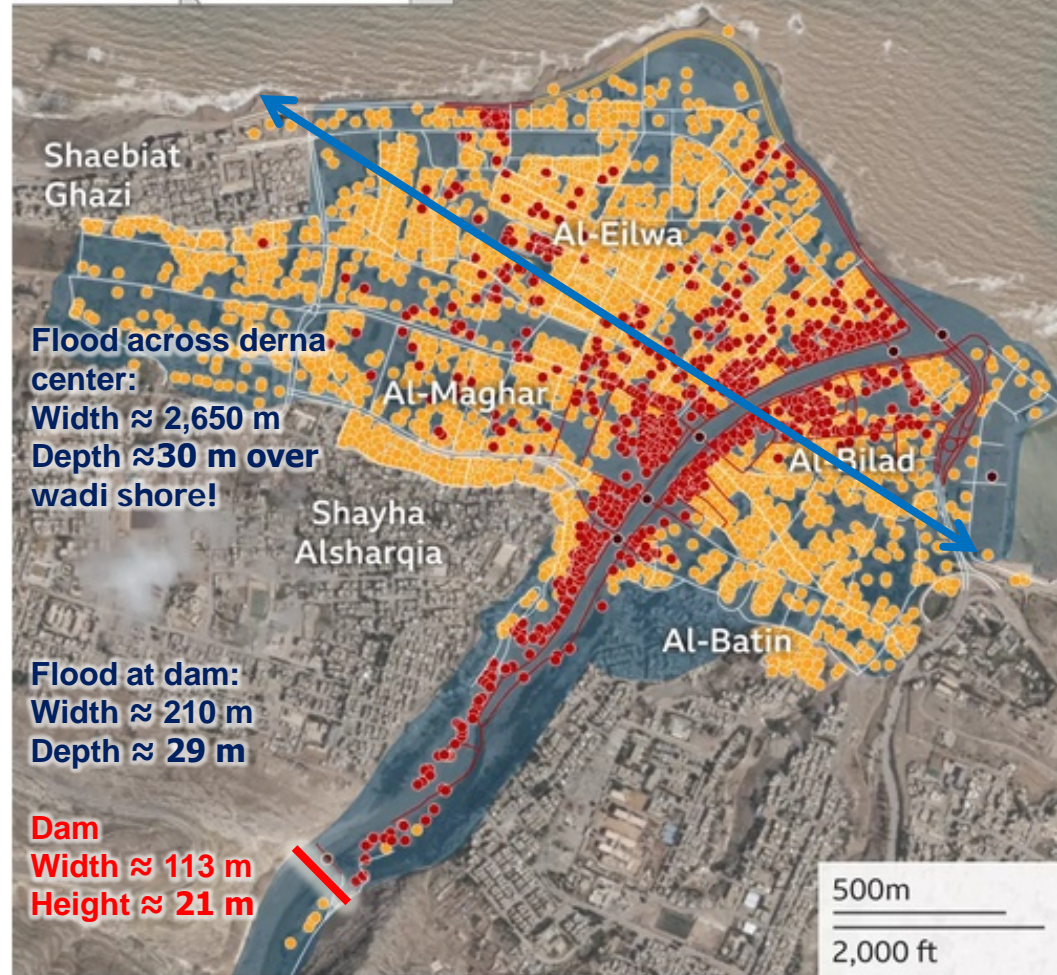
- The Libyan City of Derna (pop. ~110,000) suffered a humid apocalypse overnight on 10 September 2023. Red areas of the city were *scrubbed out* (erased) along with more than 10,000 of its residents. 
- Blue-grey areas were 'flooded' 
- Storm Daniel, rotating counterclockwise, drove its rain cells west to east parallel to catchment. 



Damage and destruction in Derna



<https://www.bbc.com/news/world-africa-66799518>
[image link](#)



Buildings

- Destroyed
- Damaged

Roads

- Destroyed
- Damaged

Bridges

- Destroyed

Flood

- Extent

Source: Planet Labs, Copernicus EMS Rapid Mapping, 14 September 2023



<https://twitter.com/ScottDuncanWX/status/1701310709412368561>

Sea cliff west of wadi entrance

This height is typical for the entire shoreline around Derna. As shown on next slide flood waters entered the ocean along 1,400 meters of shoreline. Even water in the wadi itself fell over a 6 m high cliff to drop into the ocean

SEPTEMBER 15, 2023

VIDEO: HAMZA AL AHMAR/ANADOLU AGENCY VIA GETTY IMAGES

**DERNA, LIBYA, FACES AFTERMATH OF DEVASTATING
FLOODING CAUSED BY STORM DANIEL THAT HAS KILLED**

Forbes
BREAKING
NEWS

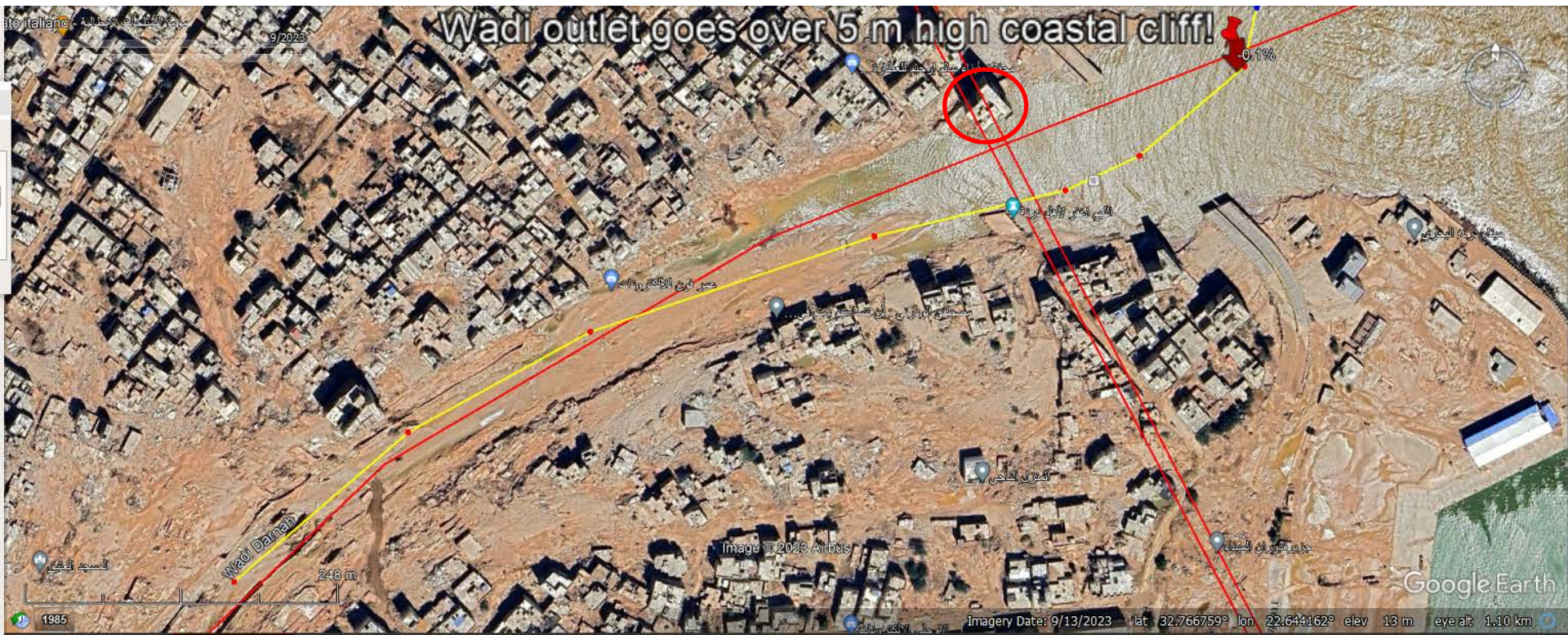


Graph: Min, Avg, Max Elevation: 1.8, 10 m
Range Totals: Distance: 1.70 km Elev Gain/Loss: 15.1 m, -21.9 m Max Slope: 13.3%, -26.5% Avg Slope: 1.6%, -2.2%



The “vertical erasure” is as remarkable as what you can see horizontally

Note the position of the circled landmark building.
This will be seen several times and is used as a measuring stick as well.

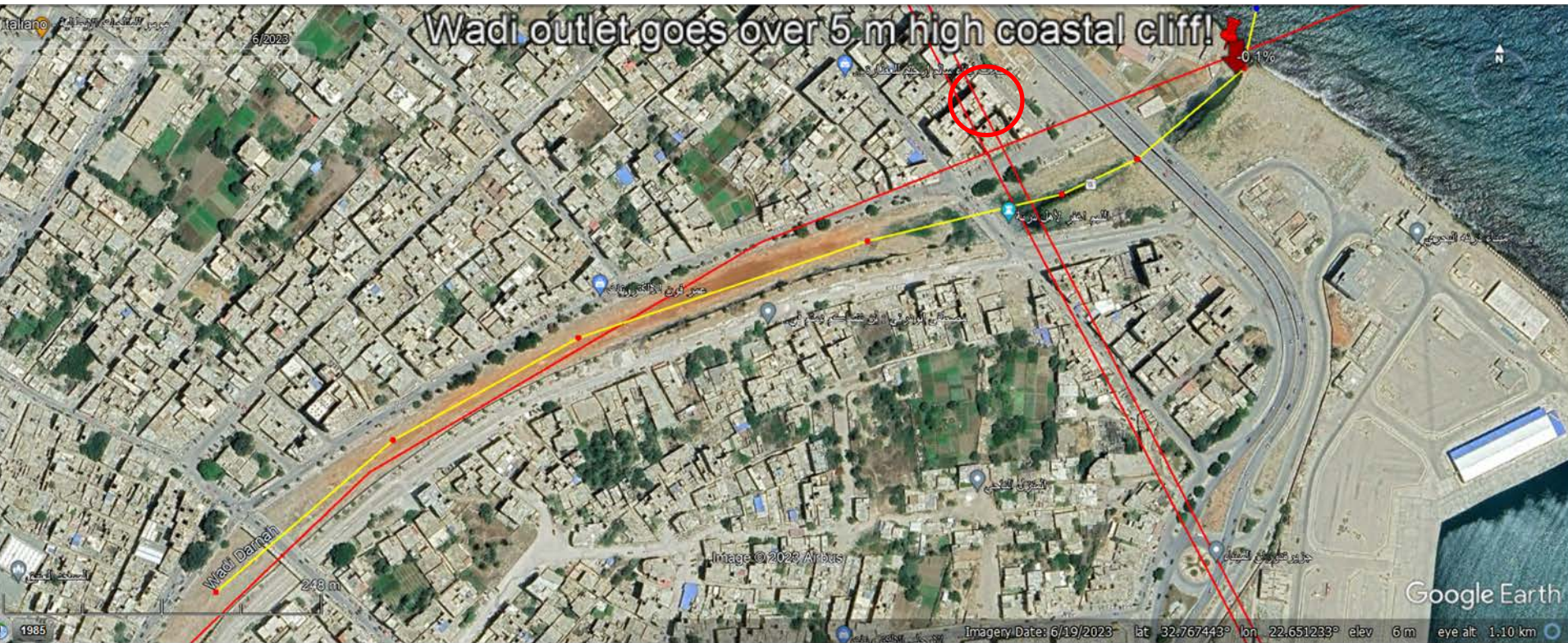


Profile of the Wadi prior to apocalypse

Note sea cliff at the end



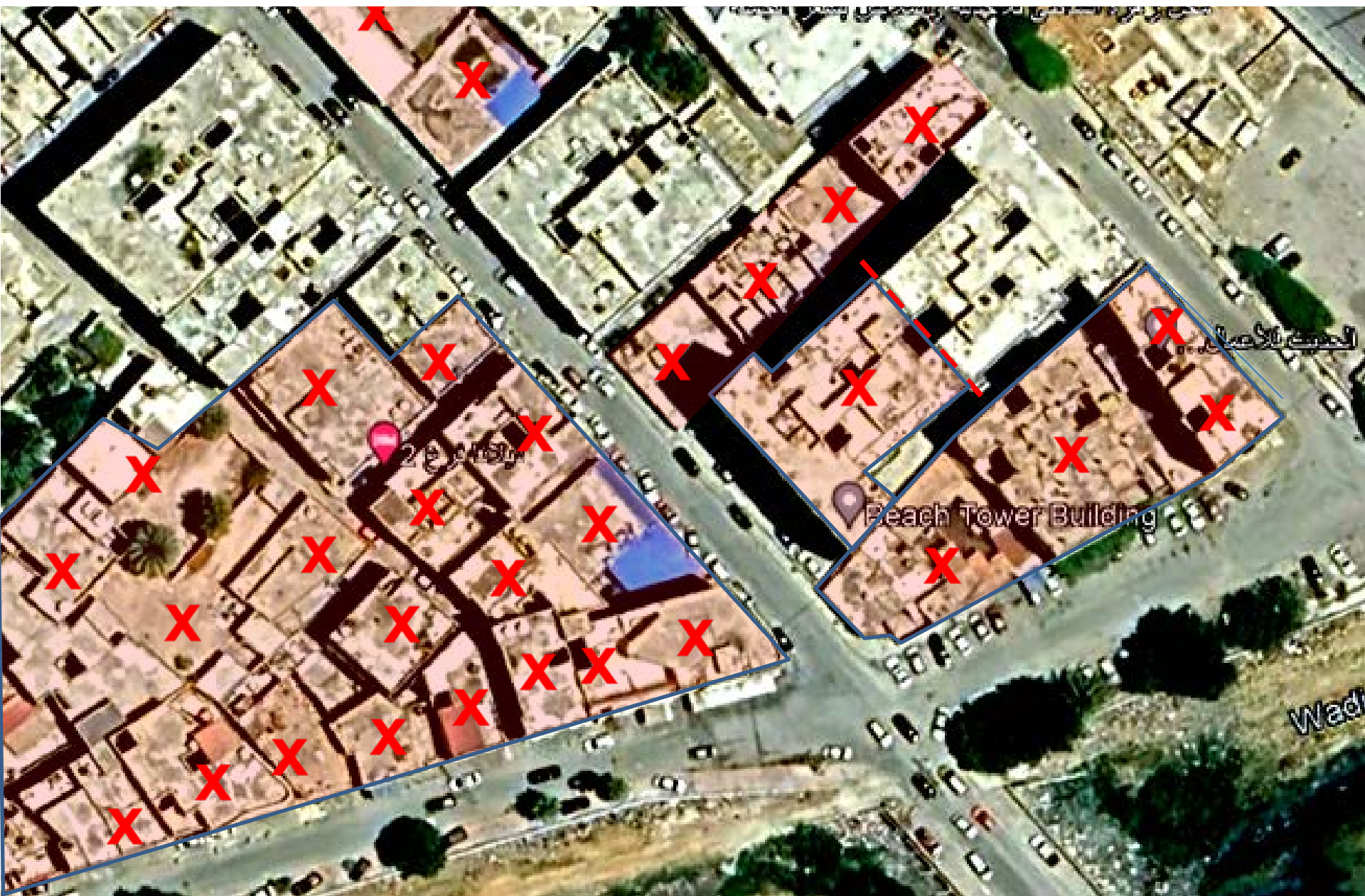
Note the red circled building. It provides a strong benchmark for measuring the flood





Totally erased buildings Xed out, shaded in pink

A major difficulty in measuring the magnitude of the cataclysm was actually comprehending and understanding what the available images actually showed, even in this tiny corner of this 9/11 event in the unfolding climate catastrophe. The remaining half of the Beach Tower Building provides an important scale for measuring the depth of the flood.



The morning after the 'flood' (before the facing of the building dried)

<https://www.documentingreality.com/forum/f245/libya-dams-collapse-248451/>

1.8 m (average height of a man) x 5.8 man heights = 10.44 m flood depth

High flood depth at dam site was 28 m, the height of the dam was 21 m

The open ocean is 140 m from exposed upstream side of this 8 story high-rise, which is 2.25 km downstream from the broken dam

Red arrows are man-sized – at least 3 figures in the open space to left set the scale

The building's ground floor is ≈ 9 m above sea level

Note: the pile of rubble in the foreground is from a mirror image of the remaining building. The incised area with windows in the the middle was a light well, The two halves were not actually glued together – see next page, There was also another row of high-rises to the right of the remaining building here – **erased !**





Drone vision zooming out



<https://www.youtube.com/watch?v=eXVVOhYvGxo>



How high was the flood in Derna?

To this point the *flooding* is completely incomprehensible to me. A major cognitive difficulty I have is that this 'flood' has transpired on the very edge of the Mediterranean Sea. The ocean is an infinitely large reservoir where a droplet of water will be pulled down to that level by gravitational force. In the first second it will fall approximately 9.8 m !. How could a column of water stand 10 m high, without collapsing down to sea level within seconds?

Comprehensible or not, the before & after imagery makes it clear that surviving buildings within several hundred meters of the Wadi Derna were 'flooded' to the 2nd or 3rd floors, and it is equally clear that many 4-6 story buildings were simply erased from the map.

The following sequence of snaps from drone footage and Google Earth hammers home that the actual reality was beyond imagining



That is a f*ing tree trunk at 3rd floor height !

That is the open ocean !

A snapshot of the tree-trunk from someone's drone

https://www.facebook.com/watch/?ref=search&v=858526872513098&external_log_id=2b21a993-5d45-4053-87a7-63c2c66bc0d3&q=derna%20dam

B N N News

A rag caught
on a wire

A humble, battered tree trunk jammed into a 3rd floor flat in what was the *middle of a once larger building* makes the reality very stark, indeed!

Without the face on view of the previous picture, this pile of rubble smashed into the upstream side of what is left of the building would not be comprehensible. But given that, there is no misunderstanding of what this picture shows.



The surviving buildings outlined in blue show damage to 2nd & 3rd floors

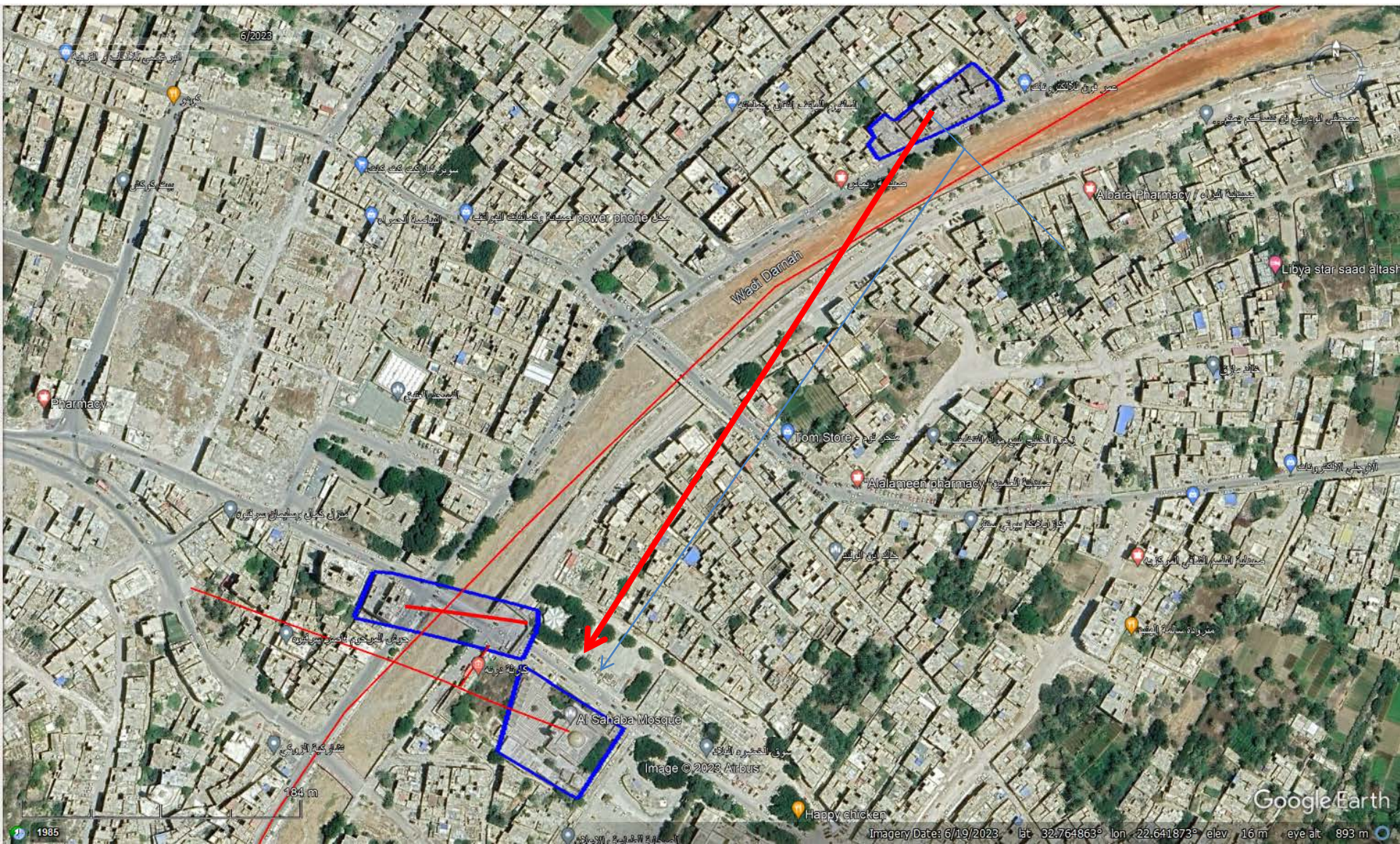


s Derna Reels from Catastrophic Impact of Tsunami-Sized Flood, Search on for Missing | N18V



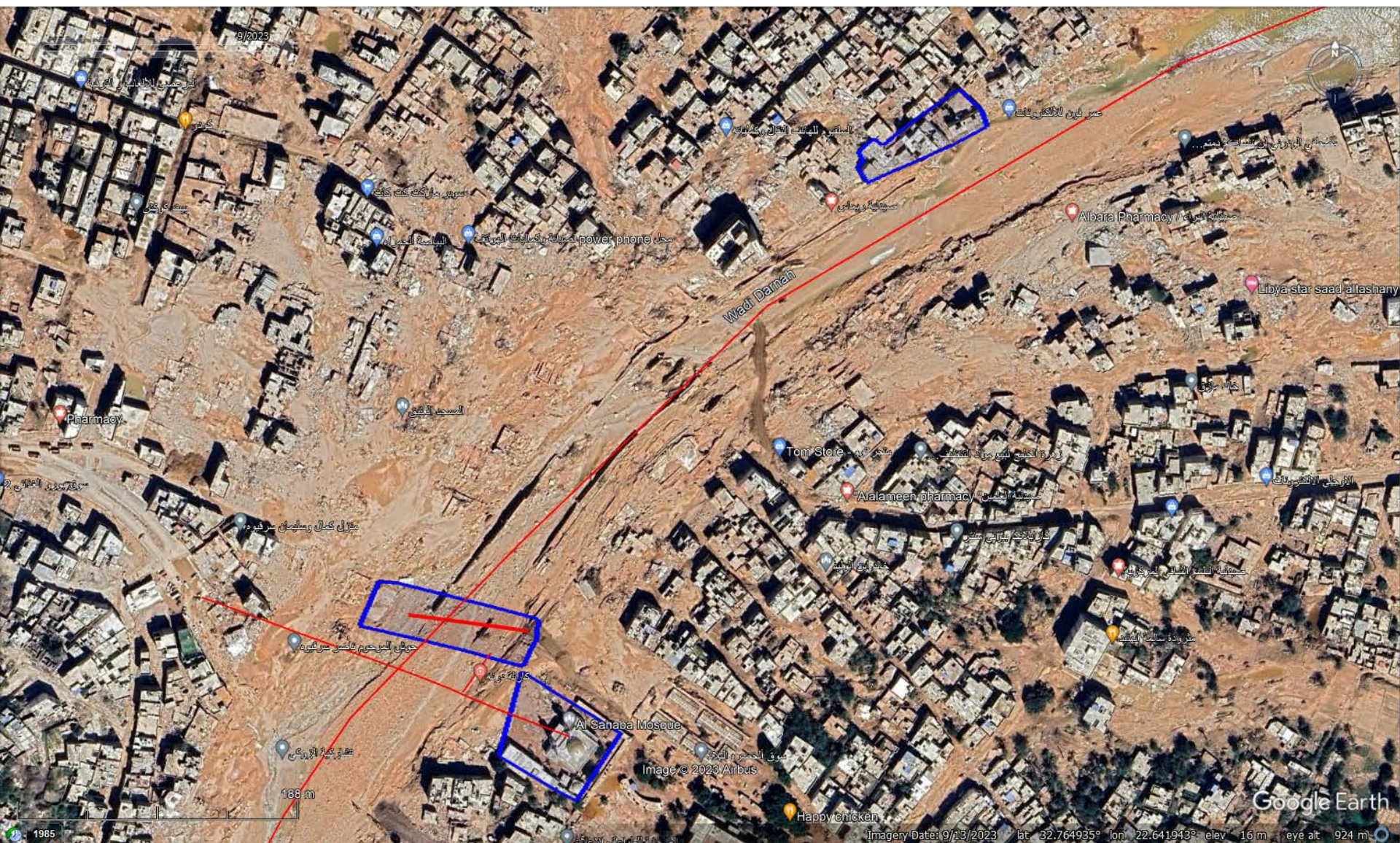
NEWS 18
Click

The next stop, $\sim \frac{1}{2}$ km up stream from the row of buildings
has several tales to tell



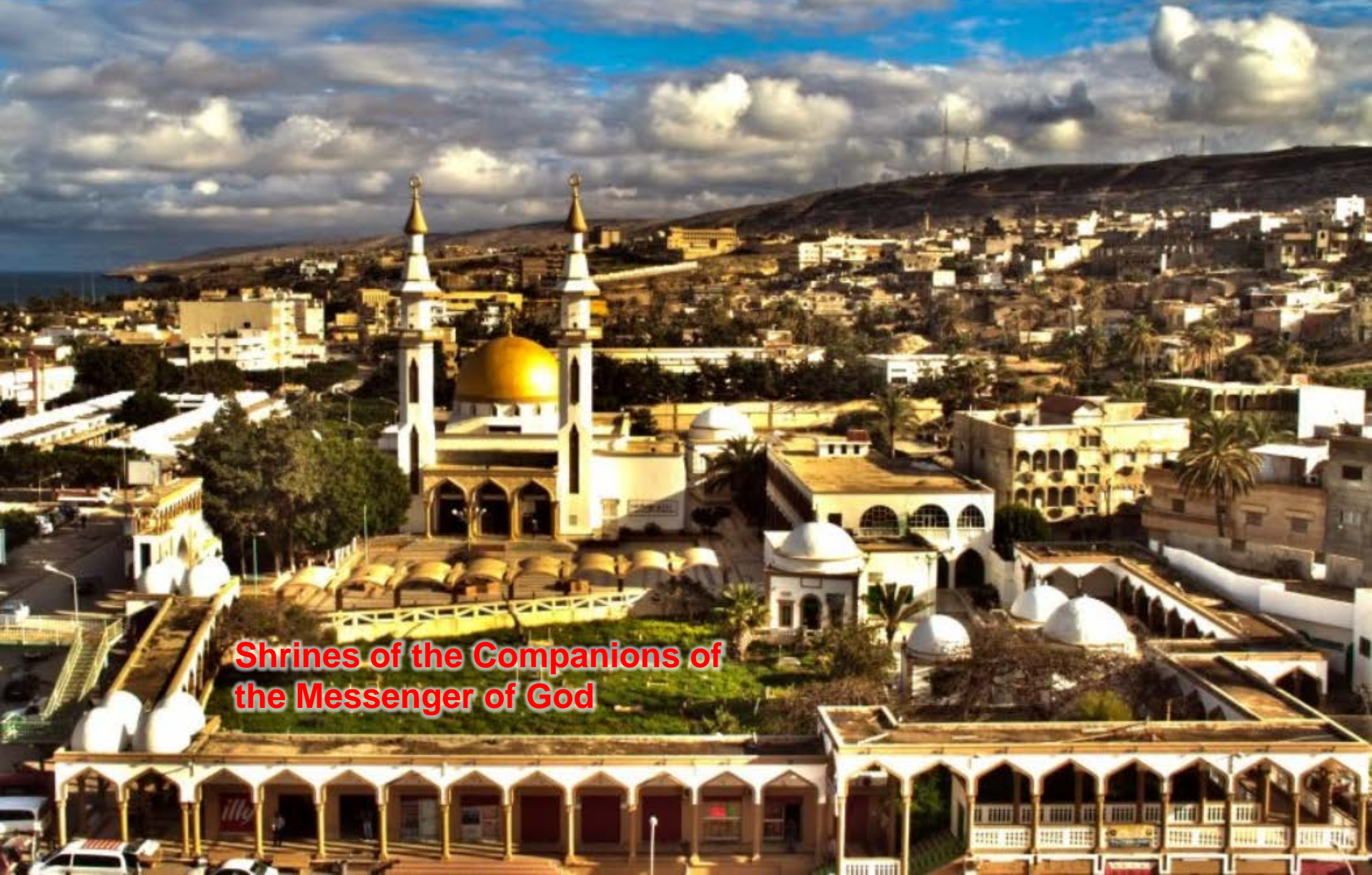
The epicenter of the cataclysm – where the ‘flood’ branched in several directions

The thick red line in the blue box is a sight line between things that no longer exist, but that locates a critical viewpoint
The blue quadrilateral is Derna’s central Al Sahaba Mosque that is a central landmark for several measurements



Al Sahaba mosque provides several rulers

<https://www.facebook.com/100003185384505/videos/pcb.6651183531664427/241696525528287>



**Shrines of the Companions of
the Messenger of God**

Late afternoon, the rain has started....



The flooding began in the evening!

‘Eastern Government’ said dam was heard to “explode” at 3:00 AM

International Red Cross said waves that hit the city were as high as 7 m.

...

Actually, they were much higher!

https://www.facebook.com/watch/?ref=search&v=1674605386370466&external_log_id=2c934db8-a4b9-4937-a168-3c0093dd13aa&q=derna%20dam



Stoppable video of rising flood + measurable aftermath

<https://www.bbc.com/news/av/world-africa-66787997>

1:29 min of the piddling flood –

The cataclysm is yet to come!

اسمعو العياط
ما فيش اخبار عليهم الى الان

A lightning flash shows the waves and spray coming down the fast lane over what was the center of the wadi

Floods tear through Libyan city of Derna

اسمعو العياط
ما فيش اخبار عليهم الى الان



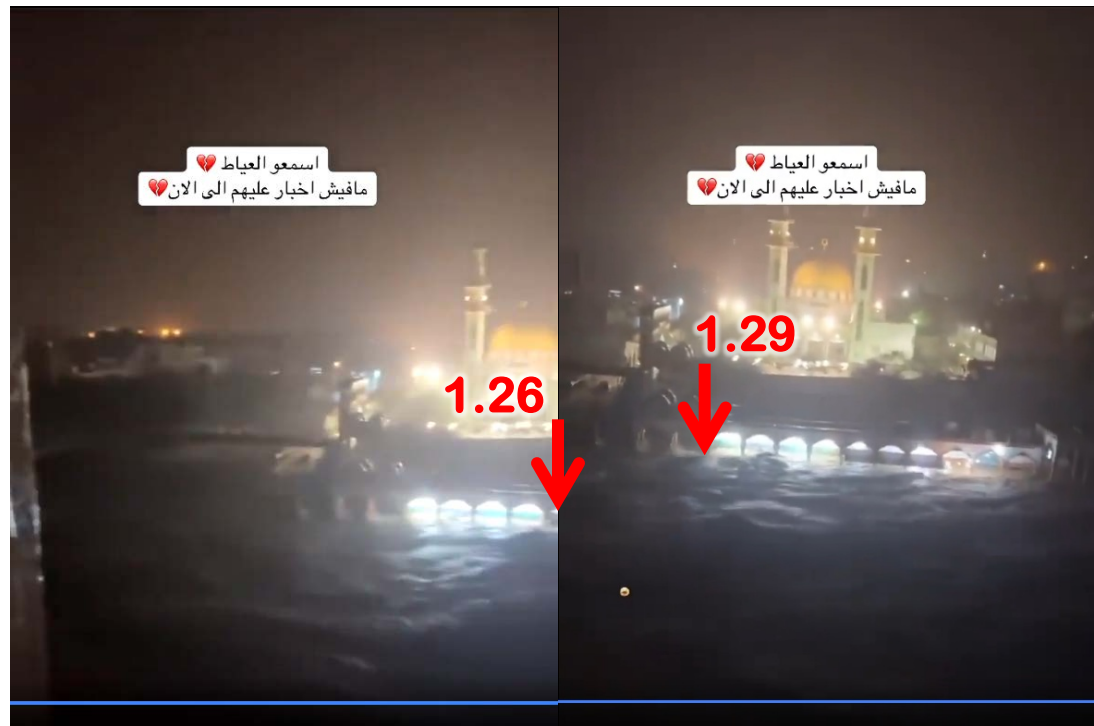
FLOW RATE CALCULATION

Floating container passed 4 pillars in 3 sec.

Arcade had 12 arches and was 36 m long as measured on Google Earth giving 3 m between centers of pillars, thus taking 3 s to go 12 m

net speed 4 m/sec = 14 km/hr (in the slow lane)

- 1: the container was in relatively calm flow of water in shallows over the street compared to the violently turbulent flow within the wadi proper. At peak flood the water was high enough to flood the main floor of the mosque to above the height of the main doors. Arrows show its movement over 3 seconds.
- 2: It is something of a miracle that this video exists at all. It was filmed from upper floor of a 7 story building across the wadi by someone in a group of girls/women. There was no trace of the building when the sun came up! Did the video only survive as a live feed, or was the phone carried out?



EVENING, 10 Sept. 2023

CATACLISM !

3:00 AM ?

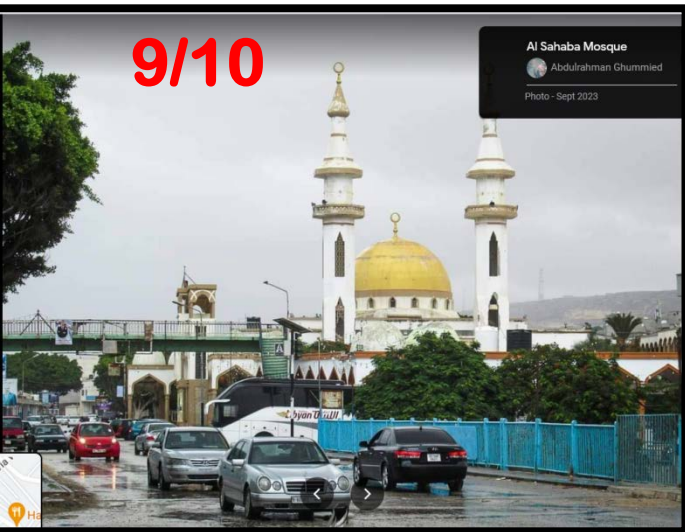
MORNING, 11 Sept. 2023

Daybreak – the raging flow is subsiding with the damage done....

https://www.facebook.com/watch/?ref=search&v=850392156454065&external_log_id=2c934db8-a4b9-4937-a168-3c0093dd13aa&q=derna%20dam



Main bridge, cars, footbridge, trees, arcades, shrines, arable soil – **ERASED!**



The mosque survived, but nothing else did between there and some high ground on the other side of the wadi



Google

Image capture: Sept 2023

Images may be subject to copyright.

Australia

T

A bit of history firmly establishes a time-line to define just how unique what unfolded in front of the Al Sahaba Mosque is in reality

- *Sahaba* were people who were physical companions of the Prophet Mohammed during his lifetime (i.e., “Companions of the Messenger of God”), e.g., acquaintances, people who fought along side him as he gained control of Arabia.
- After Mohammed’s death some of these Sahaba dispersed west into Egypt and Cyreniaca (now the eastern coastal areas of Libya) where they established the Muslim faith by proselytization and conquest around 643-644.
- As they died (or were killed in combat?) they were buried in graves or tombs alongside the Wadi Derna in the area in front of the present Al Shahaba Mosque (I have found no information on when the mosque itself was established)
- At some point shrines were also built over the graves in association with the Mosque.
- Some of these, including the one pictured here, were blown up in the disorders following the demise of Muammar Gaddafi around 2011. But apparently the graves survived intact and shrines were rebuilt.
- **In other words, the Sahaba remained interred in their graves from the last half of the Seventh Century CE until the early hours of 11/09/2023 – significantly longer than a millennium.**

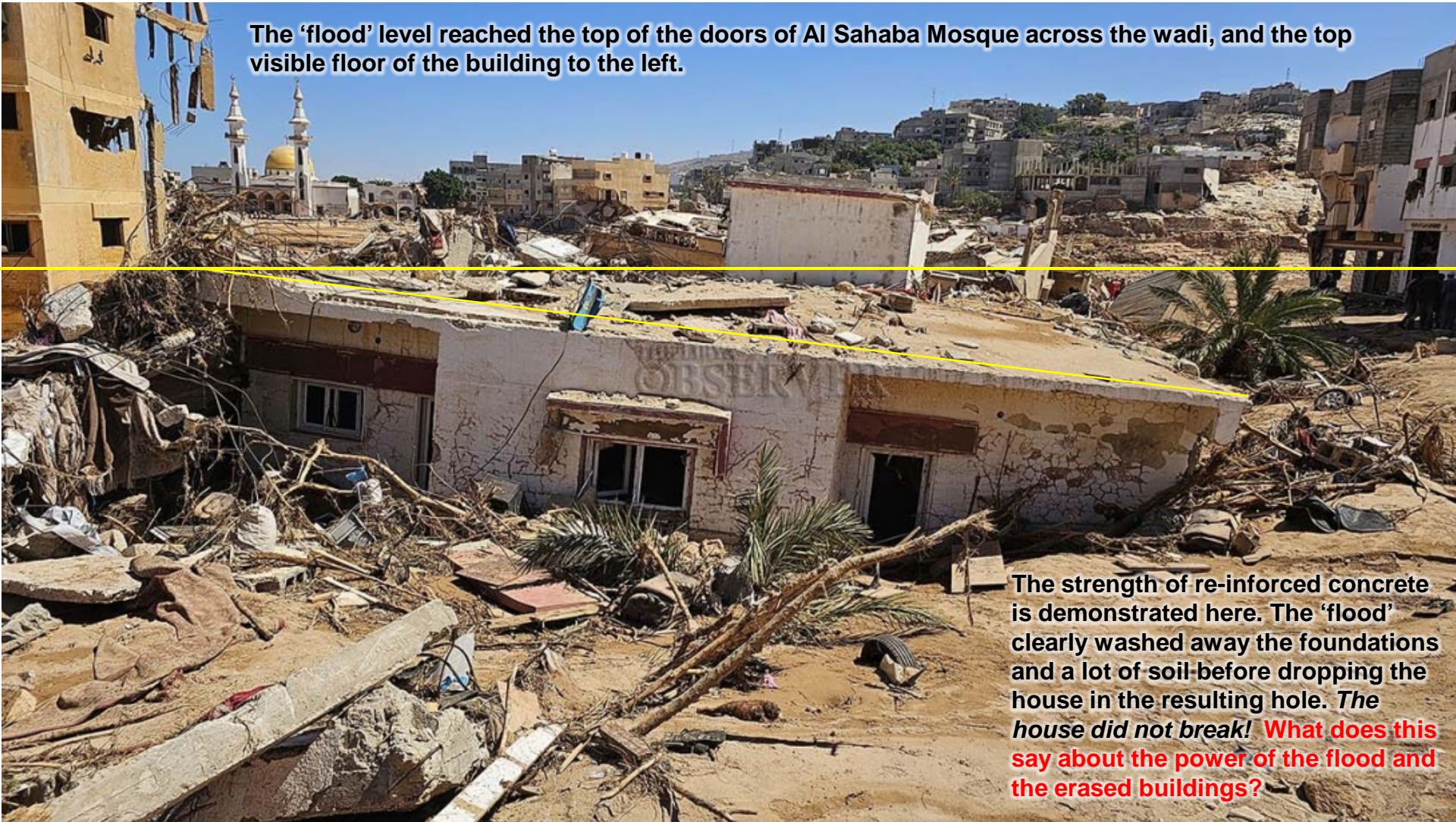


<https://libyaobserver.ly/opinions/exposing-derna-tragedy>

"The old city and the shrines of the graves of the conquering Prophet Companions, may Allah be pleased with them, represent a witness to the extent of the change that has affected features of the city. These historical monuments withstood the floods that the city witnessed throughout its history, but this flood led to their complete destruction and indeed reducing them to nothing.

The flood was like a reverse tsunami that swept away all the neighborhoods and residences in its path. It also destroyed the northern roads leading to the city and connecting its western and eastern parts. The widespread pictures and videos show the scale of the disaster that befell the city, as floods swept away and submerged more than a third of the city.

Preliminary estimates of the number of deaths indicate that they may exceed 20,000, according to Al-Bayda Medical Center's estimates. The number of confirmed deaths has exceeded 11,000 cases as of September 13, with the numbers rising with the continued arrival of rescue teams and international civil defense teams. As for the number of missing persons, the Libyan Red Crescent has recorded about 12,000 confirmed missing cases, while the number of displaced people has reached about 30,000 in a city of 120,000 people!"



The 'flood' level reached the top of the doors of Al Sahaba Mosque across the wadi, and the top visible floor of the building to the left.

The strength of re-inforced concrete is demonstrated here. The 'flood' clearly washed away the foundations and a lot of soil before dropping the house in the resulting hole. The house did not break! What does this say about the power of the flood and the erased buildings?

“DAMS OF DEATH”

Engineered for failure

Virtually all reports blame the magnitude of the cataclysm on poor engineering in the design and construction of the dams and the even worse failings in the various governments to properly maintain the dams.

I can find no evidence in the available imagery that the upper dam was even close to half capacity before it failed. Signs of flood scouring and flood deposits around the lower dam provide significant evidence that the maximum flood level reached at the dam site was 7-9 m over the 21 m height of the dam itself, i.e., ~ 30 m deep! Similar flood heights above the wadi floor were also measured several places upstream where the wadi floor was well above the maximum reservoir level. Even in these areas, all soil had been striped down to bedrock by water that must have been flowing much faster than the rate measured at the Al Sahaba Mosque. In some of the middle areas where post-flood high resolution imagery is available, flood levels may have been as high as 40 m. That, plus obvious signs of scouring in tributaries and side drains in these areas suggest that the heaviest rain may actually have been downstream from the upper dam.

I have not found any post-flood high resolution imagery for any part of the catchment above or including the upper dam.

In any event, mud-pie dams and criminal negligence do not remotely explain the extent of the damage to Derna. Unlike most catchments where dams are built for storage, Wadi Derna is a relatively straight drain of constant dimensions along the reaches where the dams were built. There was only limited storage for water.



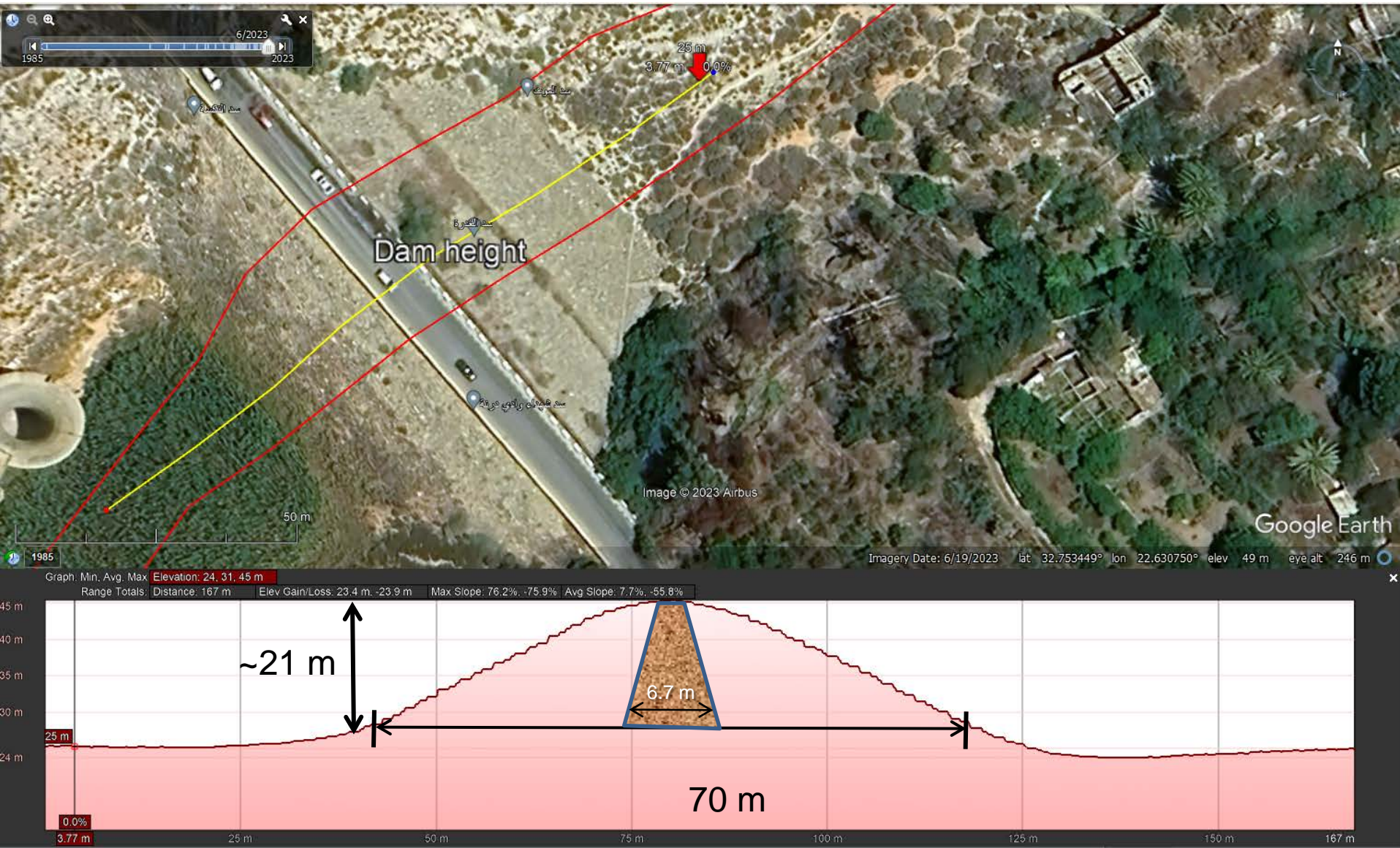
Lower dam

wadi

Lower dam in June, 2023,

Cross section of the 'mud pie' below. The upper dam clearly also had this structure

Note shrubs growing on the dam wall!



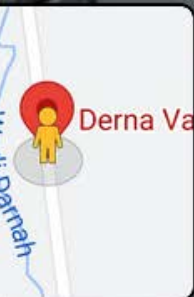
Both dams have similar steps up the west side. This is probably the lower dam soon after building. Observe the totally “porous” facing. Even rain would erode the underlying “earth” fill (scrapings from the wadi’s walls and floor).

Derna Valley Dam - سد وادي درنة



Abdulrahman Ghummied

Photo - Sept 2023



Google

Image capture: Sept 2023

Images may be subject to copyright.

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Probably the last time it had a useful amount of water in it (2020?)

Note that the limestone side-walls of the reservoir have been scraped smooth. It is very likely that the scrapings were used to provide a structurally unsound fill of un-sorted limestone rocks and crumbly 'soil'.



**Do you recognize this strange bit
of fluted concrete shorn of its
topmost frill?**

It's sitting in the the shade on the
downstream lee of a surviving building
in the center of Derna in view of the
ocean as the flood waters continue to
recede.

Can you imagine all of the waters still
draining down the wadi when this
picture was taken passing through that
funnel?





gettyimages
Credit: Anadolu Agency

Residue of the easily
eroded tamped earth
core in the lower dam
(not even a good
quality of clay?)

https://www.facebook.com/watch/?ref=search&v=345033744536623&external_log_id=2b21a993-5d45-4053-87a7-63c2c66bc0d3&q=derna%20dam



Wadi Derna dams, the beginning and the end

Dr. Abdel Moneim Saeed

(50 years remained and ended in a historic tragedy)

Derna is a city located on the banks of a large valley "[Wadi Derna](#)". This valley is more than 60 km long and the area of its catchment basin is 575 square km. As a result of the frequent occurrence of floods in the city due to the valley passing through its centre, studies conducted in the 1960s recommended the necessity of constructing more than one dam in order to protect the city and to reserve the huge amounts of water that flows through the valley at the time of flood and ends up in the sea.

At the beginning of the 1970s, a Yugoslav company built two aggregate dams (the core is made of compacted clay, and the sides are made of stones and rocks) on the valley's course, the Al-Bilad Dam, which is about 1 km south from the heart of the city, with a storage capacity of about 1.5 million cubic metres, and the Abu Mansour Dam, which is about 1 km south of the heart of the city. 13 km south of the first dam, which is a large dam with a capacity of about 22.5 million cubic metres [questionable!]. Throughout my life, I have never seen the Boumansour Dam fill due to its large storage capacity.

The construction of these dams ended the city's flood problem, which was causing huge losses of life and property. These include the 1941 flood, which caused great losses to the German army, the 1956 flood, the catastrophic flood of 1959, the 1968 flood, and the 1986 flood, which, although large, the dams played their role in preventing damage to the city. The 1959 flood remains the most painful in the city's memory due to the number of victims and material losses before the flood occurred yesterday, September 11, 2023.

The September 2023 flood is the most severe, destructive, destructive and painful in the history of this city for several reasons, including:

(1) The amounts of rain that fell in a period of less than 24 hours exceeded 200 mm [probably > 400 mm] in the valley's catchment basin. This means that the catchment basin received more than 115 million cubic meters of water, an amount much greater than the combined bearing capacity of the dams. These quantities have not been recorded previously in all recorded floods (what is meant is rain falling over several hours).

(2) The presence of dams during the past fifty years created a state of reassurance among people, which made them crawl with buildings, roads, and facilities on the banks of the valley that were not intended throughout history to construct roads and buildings.

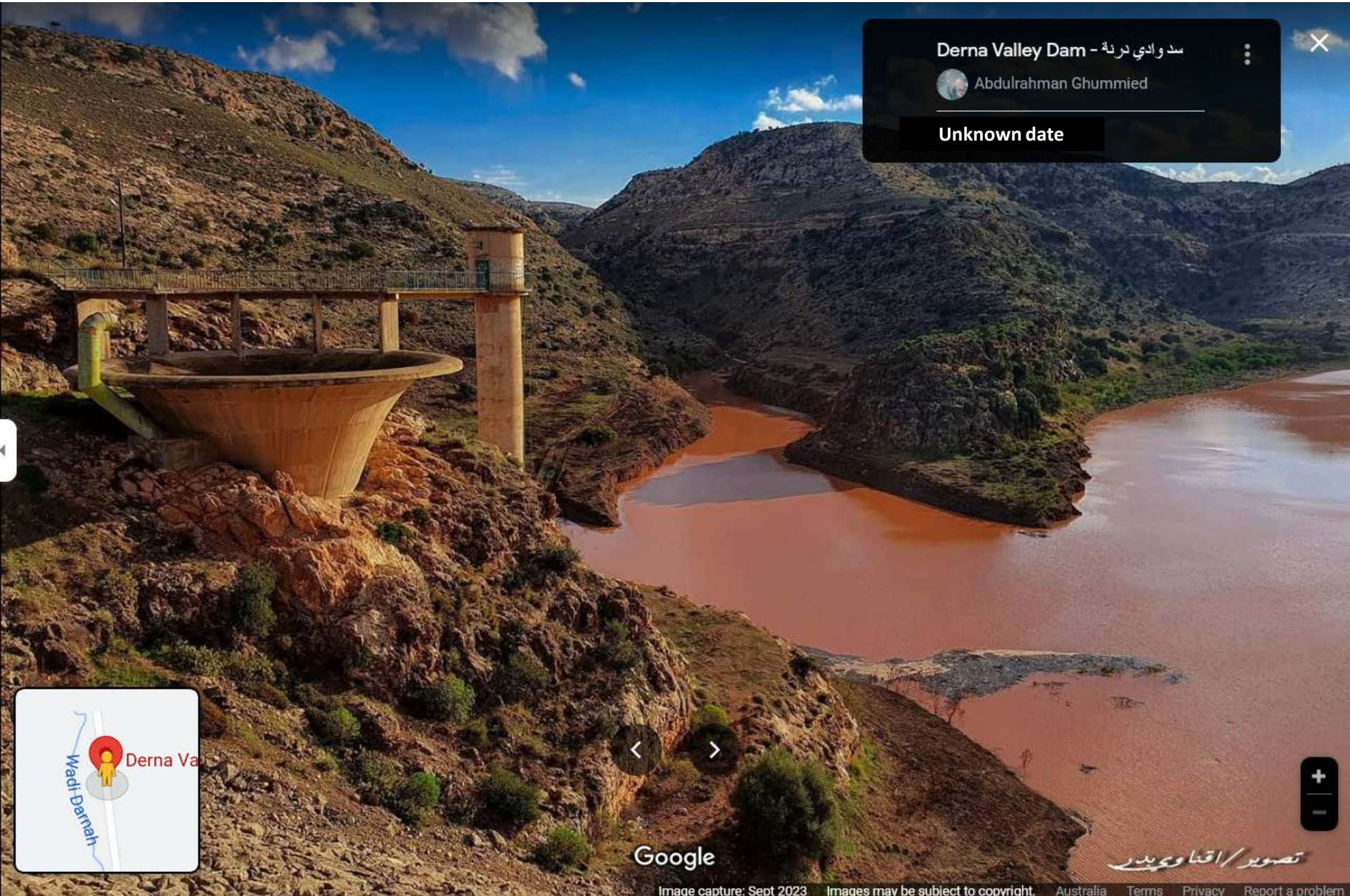
(3) Unlike previous floods, where water was flowing freely through the stream, **yesterday's dawn flood was due to the large quantities that had accumulated behind the dams, in addition to the huge additional amounts of water brought to the valley, which made this flood historic and unprecedented. One of the evidence for this is that the shrines of the Companions of the Messenger of God have remained there since the Islamic conquest, despite all the floods throughout history, until yesterday's dawn flood that swept away them and several meters below them, and the location of those shrines is now in the air several meters above the surface of the ground.**

There is no doubt that this flood has never been seen before in the city throughout its history. Everything has changed, including the city's landscape. The valley has now expanded to include several streets and neighborhoods on its sides and along its course in the city. Today, the city is without protection from any other flood, even if it is minor. Therefore, the way we deal with this valley must change from the roots.

We always say that trying to manage nature has disastrous results, and what is always correct and safe is to work with nature with its laws and reality, and not to try to control it. What happened yesterday morning will have major impacts on people's lives and their presence in the region. These dams have been in place for 50 years in full and complete, and they collapsed yesterday. This is a period that must be studied carefully, and all its positive and negative aspects must be known, not only for the sake of purely academic aspects, but also in order to anticipate different ways of dealing with dams and valleys throughout Libya.

Quoted from the news page of Libyan ministries, bodies and state institutions



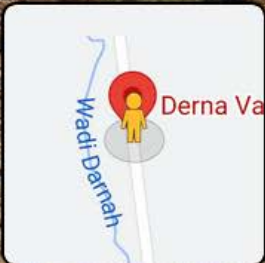


Derna Valley Dam - سد وادي درنة



Abdulrahman Ghummied

Unknown date



Google

Image capture: Sept 2023

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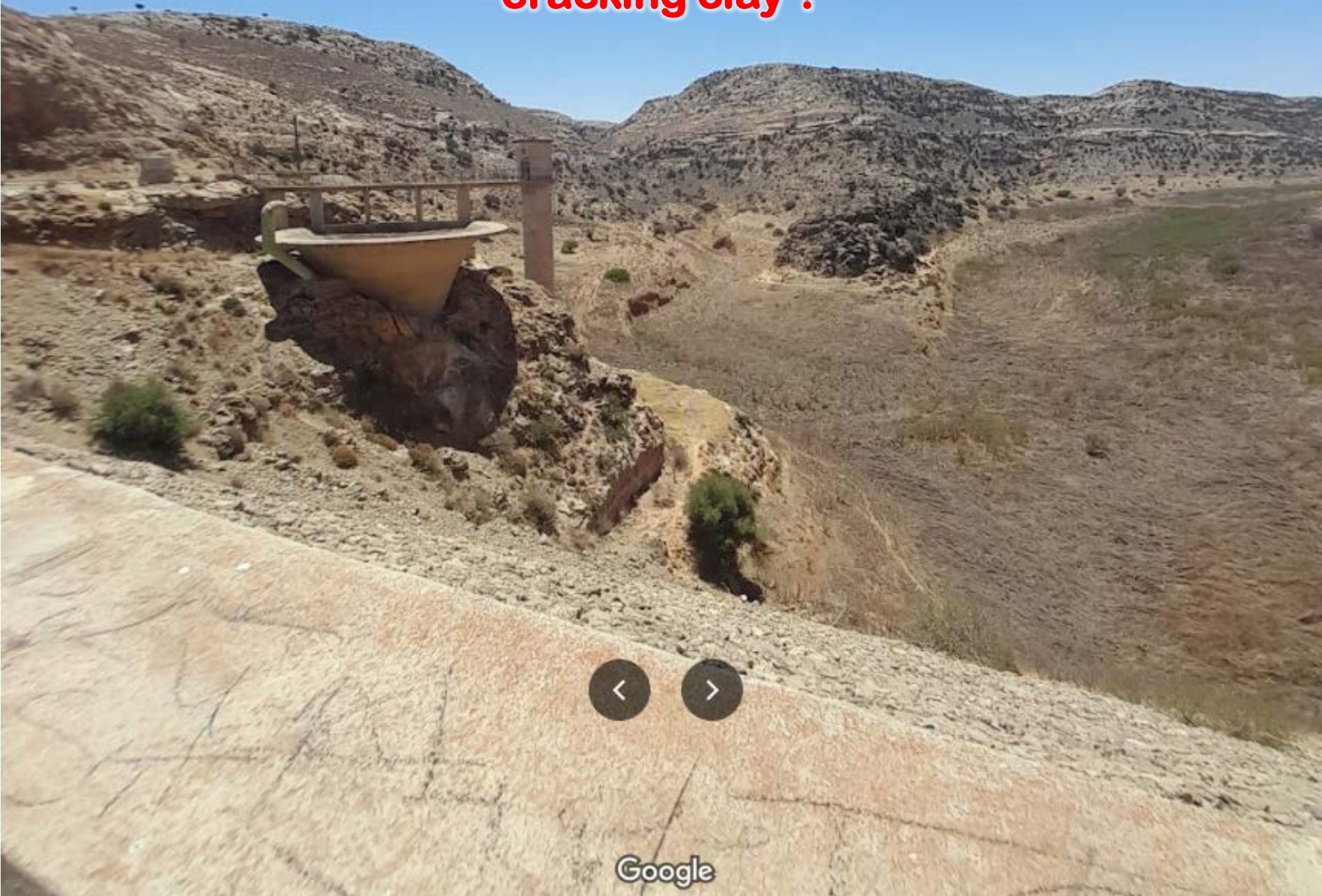
Report a problem

تصوير / اقناوويدر

Upper dam on 19/06/2023 – completely empty and dry



**Upper dam – utterly dry – July 2023
cracking clay ?**



Later in the morning – What's left of the upper dam

https://www.facebook.com/watch/?ref=search&v=1674605386370466&external_log_id=2c934db8-a4b9-4937-a168-3c0093dd13aa&q=derna%20dam

Clear scour marks in false color imaging from the EU's Sentinel Browser's lower resolution suggest the dam broke when it was only 1/3 to 1/2 full.

Note that the remaining upstream fill looks to be unsorted conglomerate scrapings, not structurally sound fill (interlocking rocks OR homogenous, compacted earth).

Neither dam had any sign of an erosion resistant spillway. The only provision for overflow in either dam was one pitifully small "morning glory" that at maximum flow rate probably could not have handled 1% of the flow going over the top of the dam in the unlikely event that it actually filled before slumping away as sediment in the flood.



The morning after the 'flood' (before the facing of the building dried)

<https://www.documentingreality.com/forum/f245/libya-dams-collapse-248451/>

1.8 m (average height of a man) x 5.8 man heights = 10.44 m flood depth

High flood depth at dam site was 28 m, the height of the dam was 21 m

The open ocean is 140 m from exposed upstream side of this 8 story high-rise, which is 2.25 km downstream from the broken dam

Red arrows are man-height – at least 3 figures in the open space to left set the scale

The building's ground floor is ≈ 9 m above sea level

Note: the pile of rubble in the foreground is from a mirror image of the remaining building. The incised area with windows in the the middle was a light well, The two halves were not actually glued together – see next page, There was also another row of high-rises to the right of the remaining building here – **erased !**



Broken dams did not do this!

<https://www.gettyimages.co.uk/detail/news-photo/rescue-teams-assist-in-relief-work-in-libyas-eastern-city-news-photo/1674185297?adppopup=true>






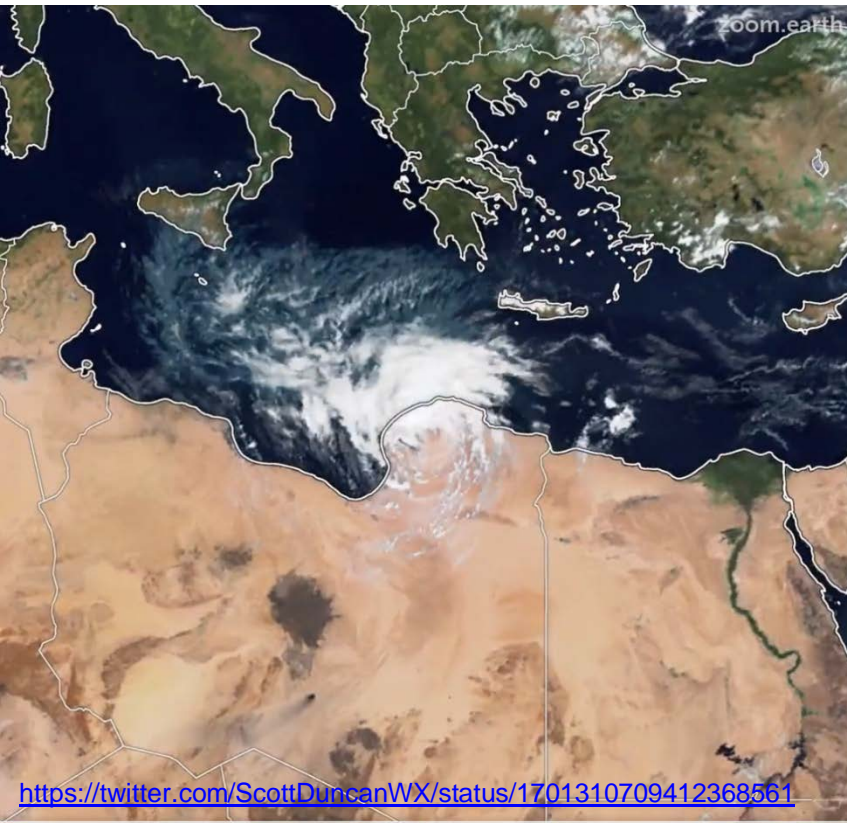
gettyimages®
Credit: KARIM SAHIB

Downstream from the mosque the flood rose to 11 man-heights above the ground floor of the building ≈ 20 m, or ≈ 34 m from the wadi bottom!
The dam was only 21 m high!



LETHAL HUMIDITY

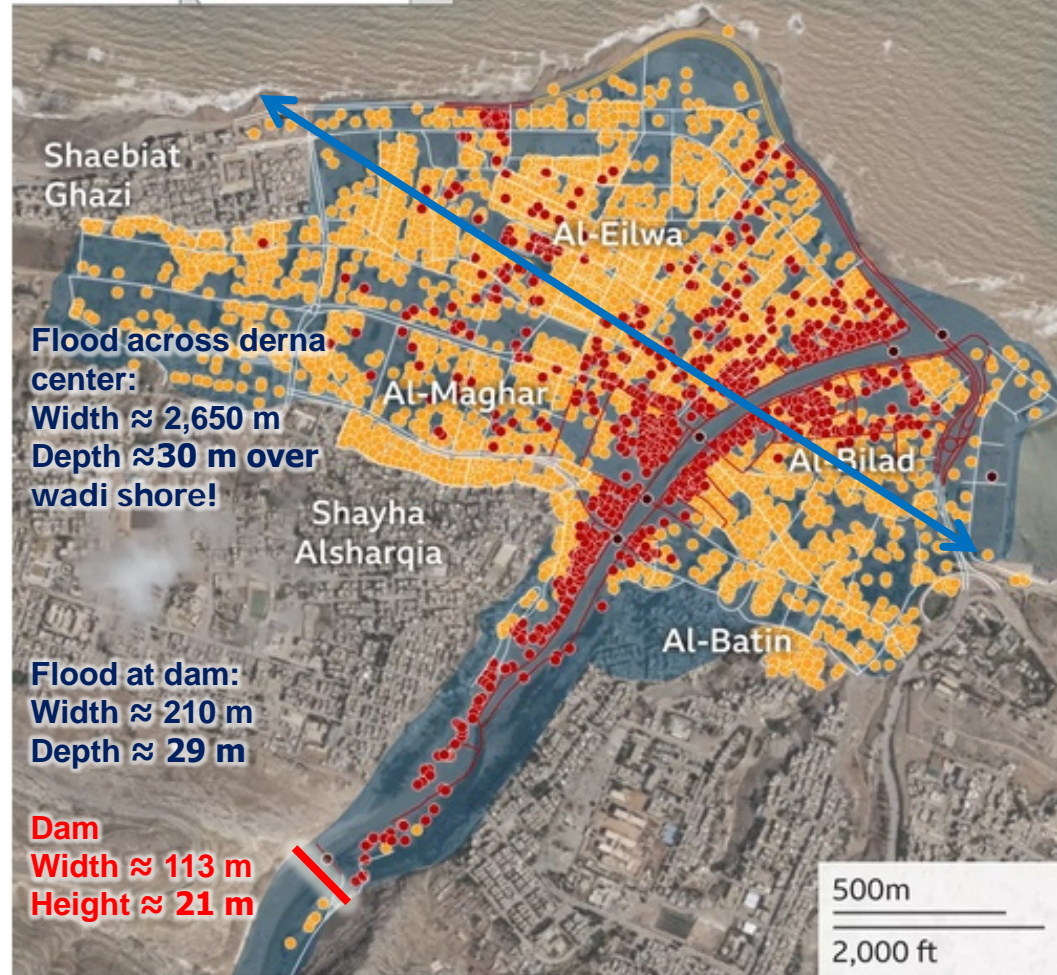
- The Libyan City of Derna (pop. ~110,000) suffered a humid apocalypse overnight on 10 September 2023. Red areas of the city were *scrubbed out* (erased) along with more than 10,000 of its residents. 
- Blue-grey areas were 'flooded' 
- Storm Daniel, rotating counterclockwise, drove its rain cells west to east parallel to catchment. 



Damage and destruction in Derna



<https://www.bbc.com/news/world-africa-66799518>
[image link](#)



Buildings

- Destroyed
- Damaged

Roads

- Destroyed
- Damaged

Bridges

- Destroyed

Flood

- Extent

Source: Planet Labs, Copernicus EMS Rapid Mapping, 14 September 2023

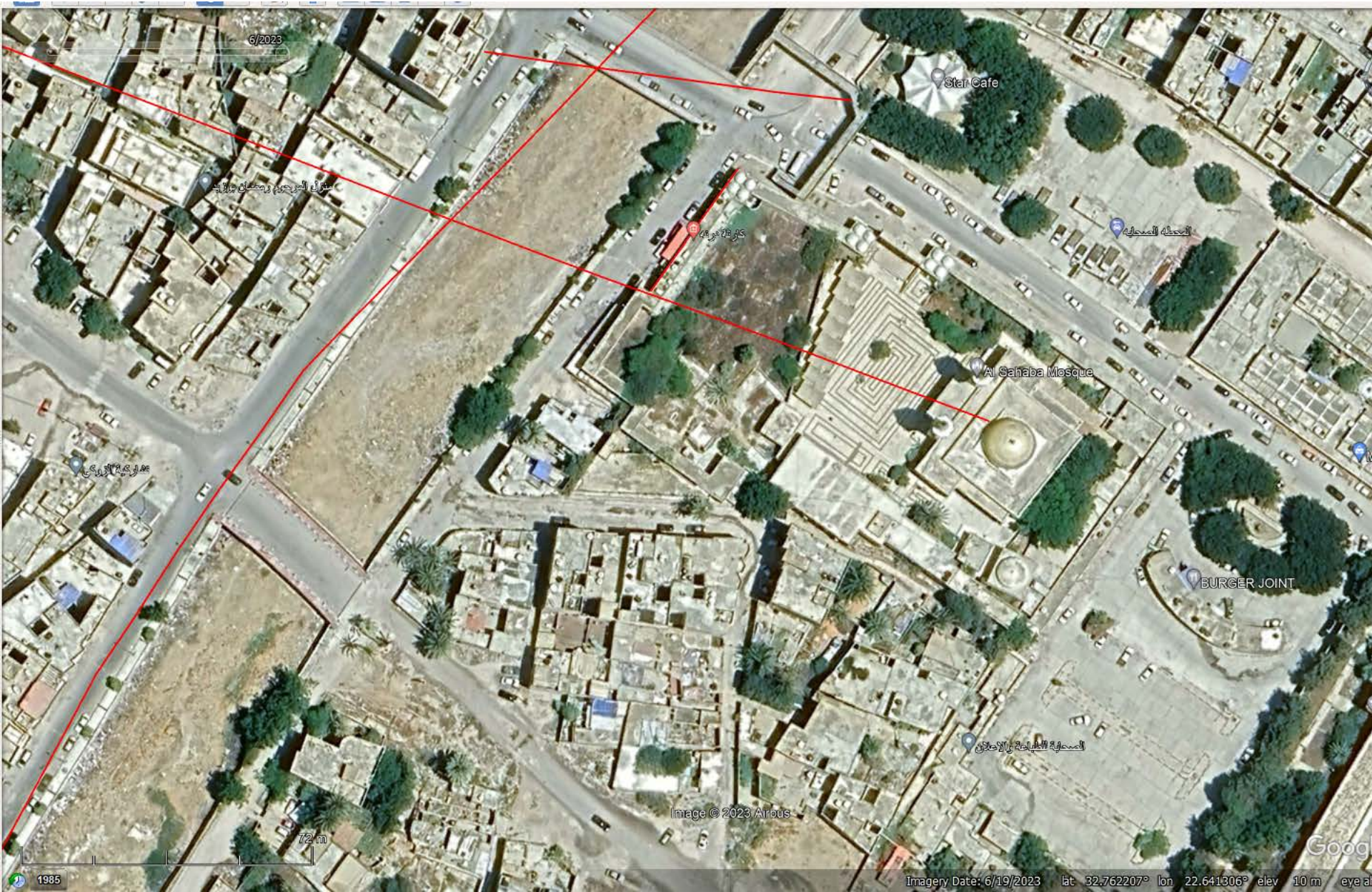


<https://twitter.com/ScottDuncanWX/status/1701310709412368561>

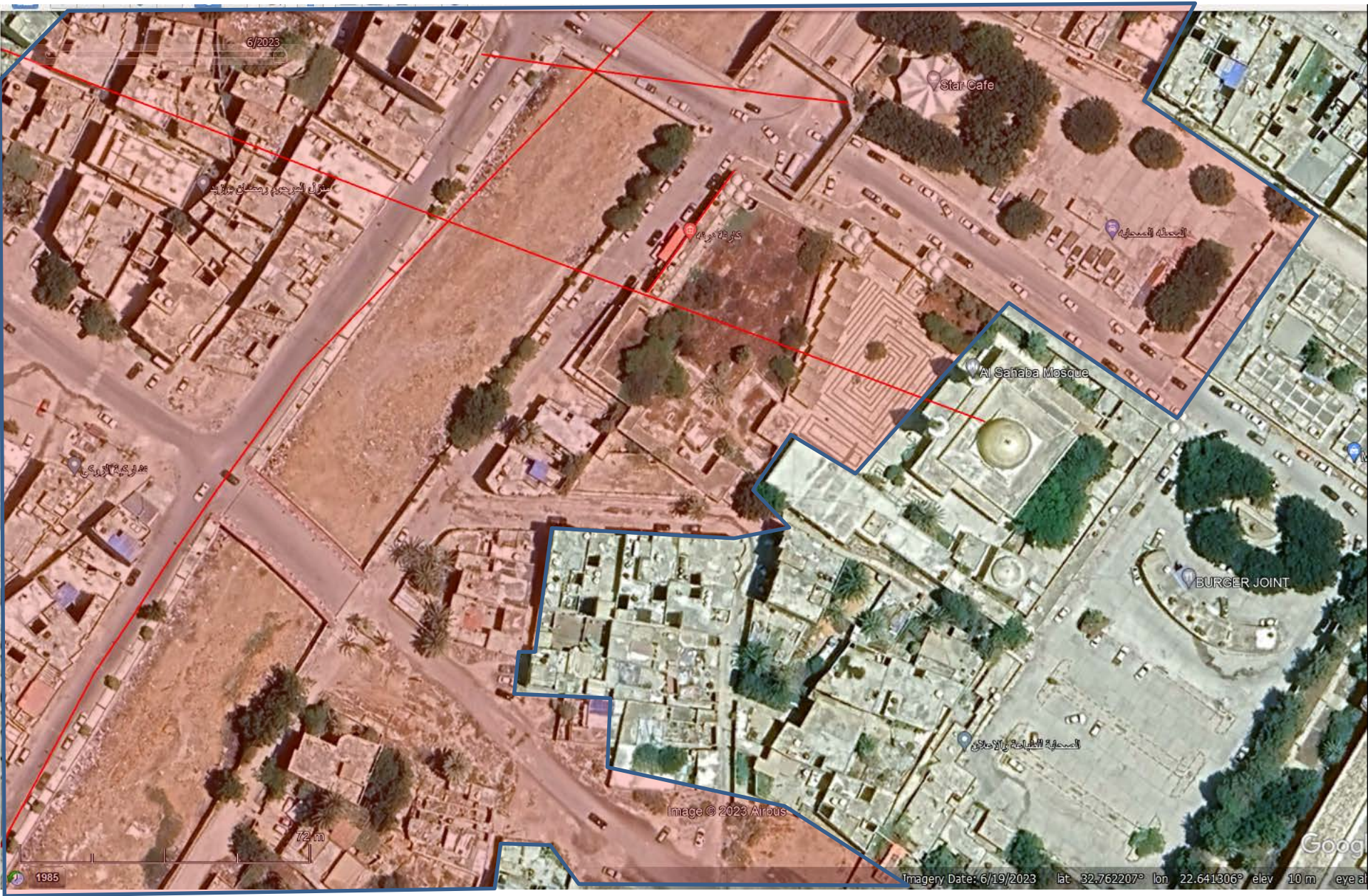
PARADOX

**How could the flood be higher than in the wadi at the
ex dam site after spreading out over a flood area more than
10 x the width of the wadi?**

Later in the night the water rose to > 20 m, structures and vegetation were 'erased' and transported out to sea. The mosque was flooded to higher than the surrounding arcades left standing.



Everything in pink areas was '**ERASED**' (i.e. scrubbed out) and transported out to sea.
The mosque was flooded to the height of its ceiling.



BROKEN MUD PIE DAMS HAD NOTHING TO DO WITH DAMAGE ON THIS SCALE!



“The Shrines of the Companions of the Messenger of God have remained there since the Islamic conquest, despite all the floods throughout history, until yesterday’s dawn flood that swept away them and several meters below them, and the location of those shrines is now in the air several meters above the surface of the ground.”

BROKEN MUD PIE DAMS DID NOT DO THIS

**Shrines of the
Companions of the
Messenger of God
?**

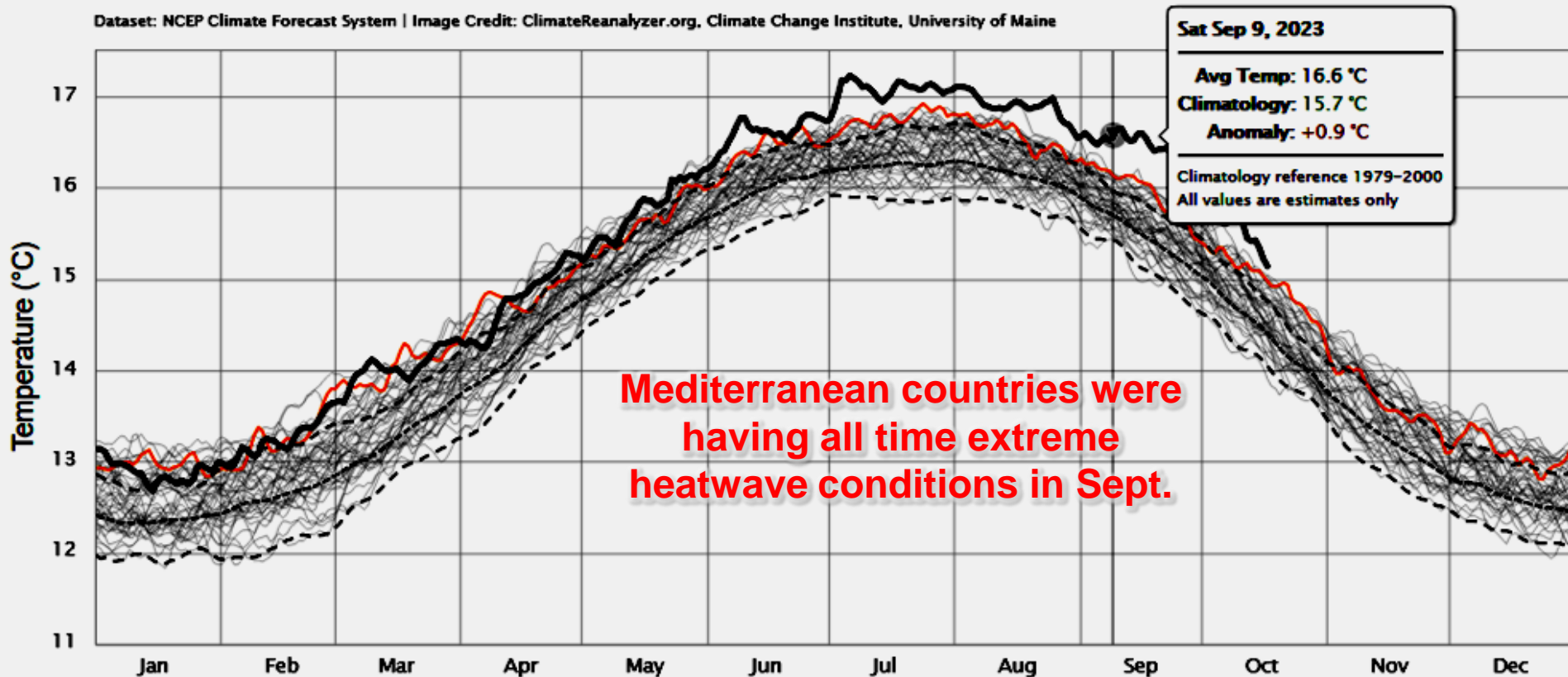


LETHAL HUMIDITY

Daily Surface Air Temperature, World (90°S–90°N, 0–360°E)

≡ Export Chart

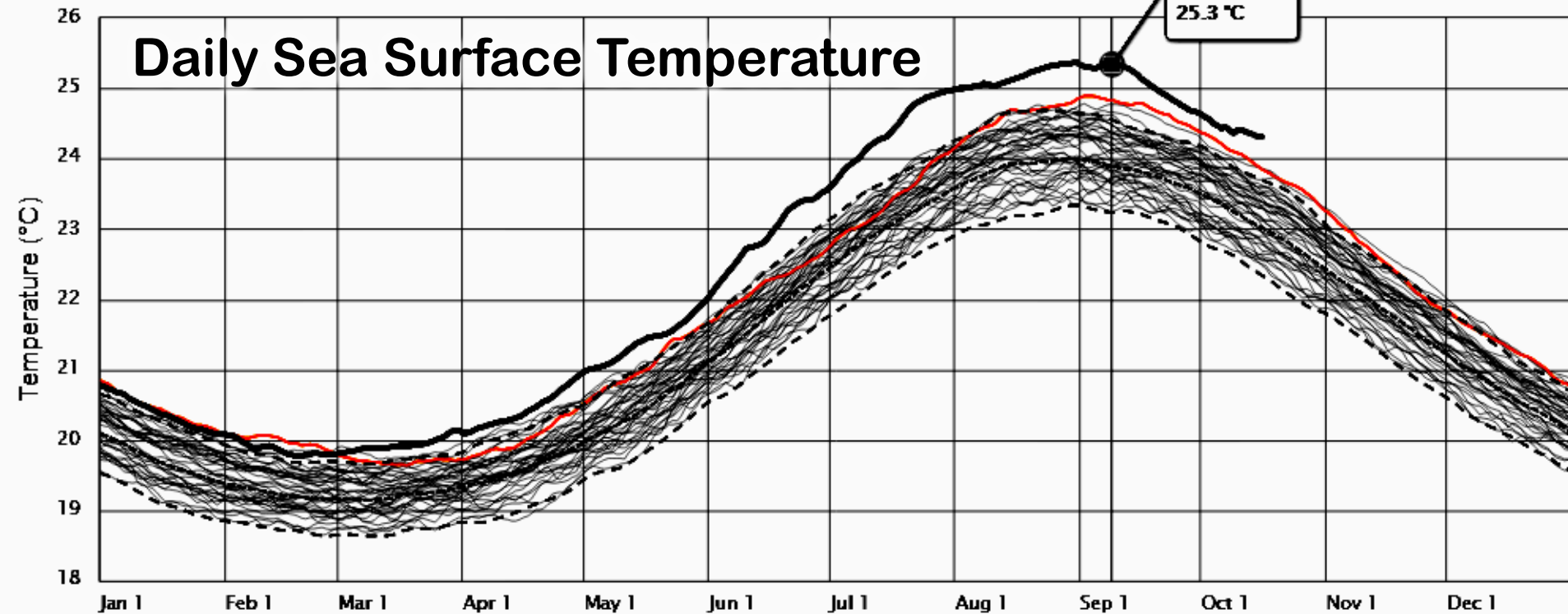
Dataset: NCEP Climate Forecast System | Image Credit: ClimateReanalyzer.org, Climate Change Institute, University of Maine



Data Source: NOAA OISST V2.1 | ClimateReanalyzer.org, Climate Change Institute, University of Maine

Saturday
Sep 9, 2023
25.3 °C

Daily Sea Surface Temperature



For every 1 °C increase in temperature our atmosphere can hold ~ 7% more water vapor to create havoc

The hotter water is the faster it will evaporate into water vapor

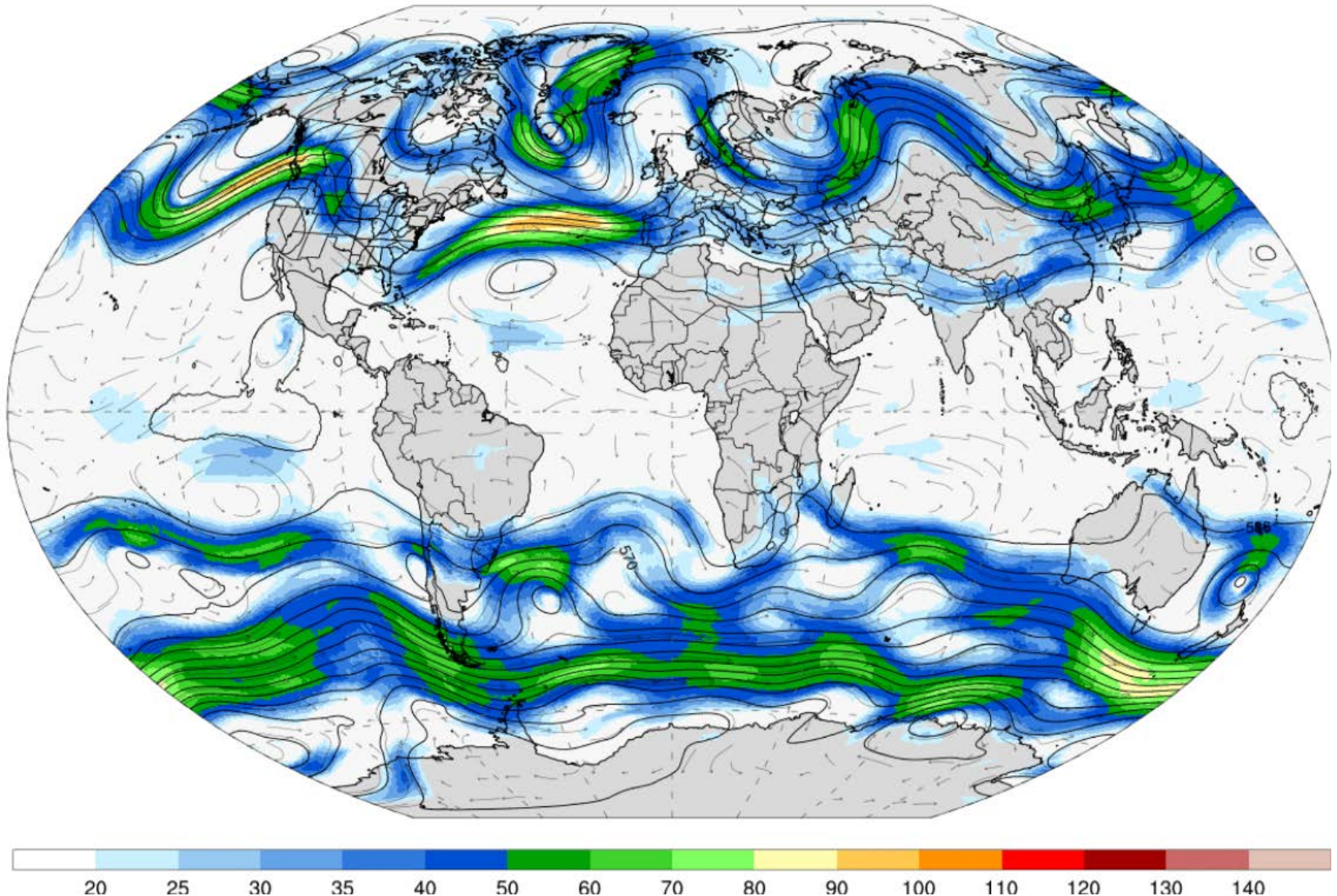
As the world warms, jetstreams slow and wander. Slow and lazy jet streams do not keep weather systems moving. Storm Daniel had megatons of humidity to feed on, and jet streams did nothing to move it away from the ocean of humidity it was feeding on

GFS 500hPa Jetstream (kt) & Height (dam)

1-day Avg | Wed, Oct 18, 2023

ClimateReanalyzer.org

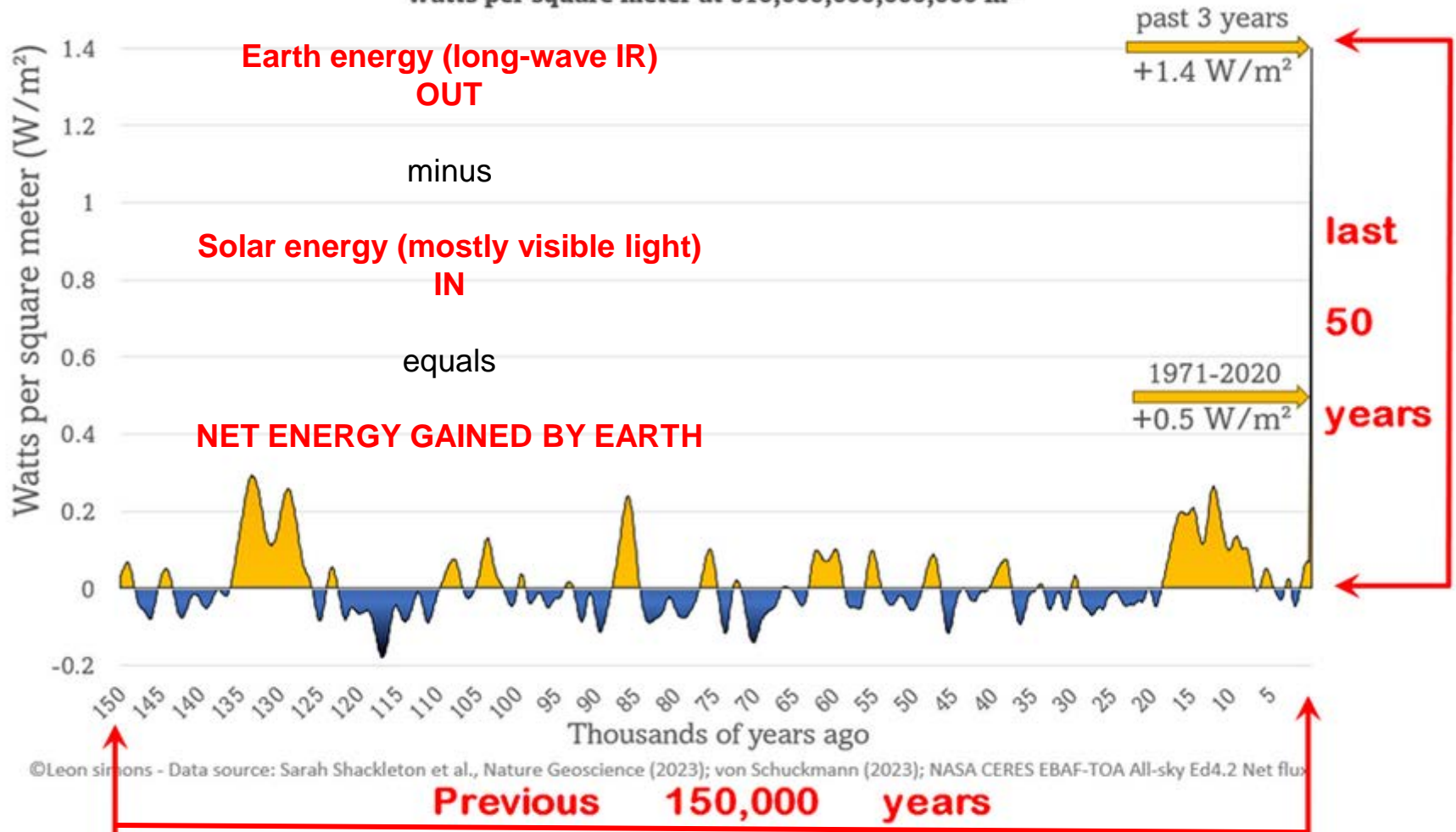
Climate Change Institute | University of Maine



**All of the above is a consequence of humanity's despoliation of
our only planet**

Earth's Energy Imbalance

Watts per square meter at 510,000,000,000,000 m²



The thread from <https://twitter.com/LeonSimons8/status/1698413266421096893> explains in some detail how the following graph was inferred and extrapolated

Exponential growth over the last 23 years!

Heating of Earth Expressed in Hiroshima Bomb Equivalents

12 month running mean vs. 36 month step average

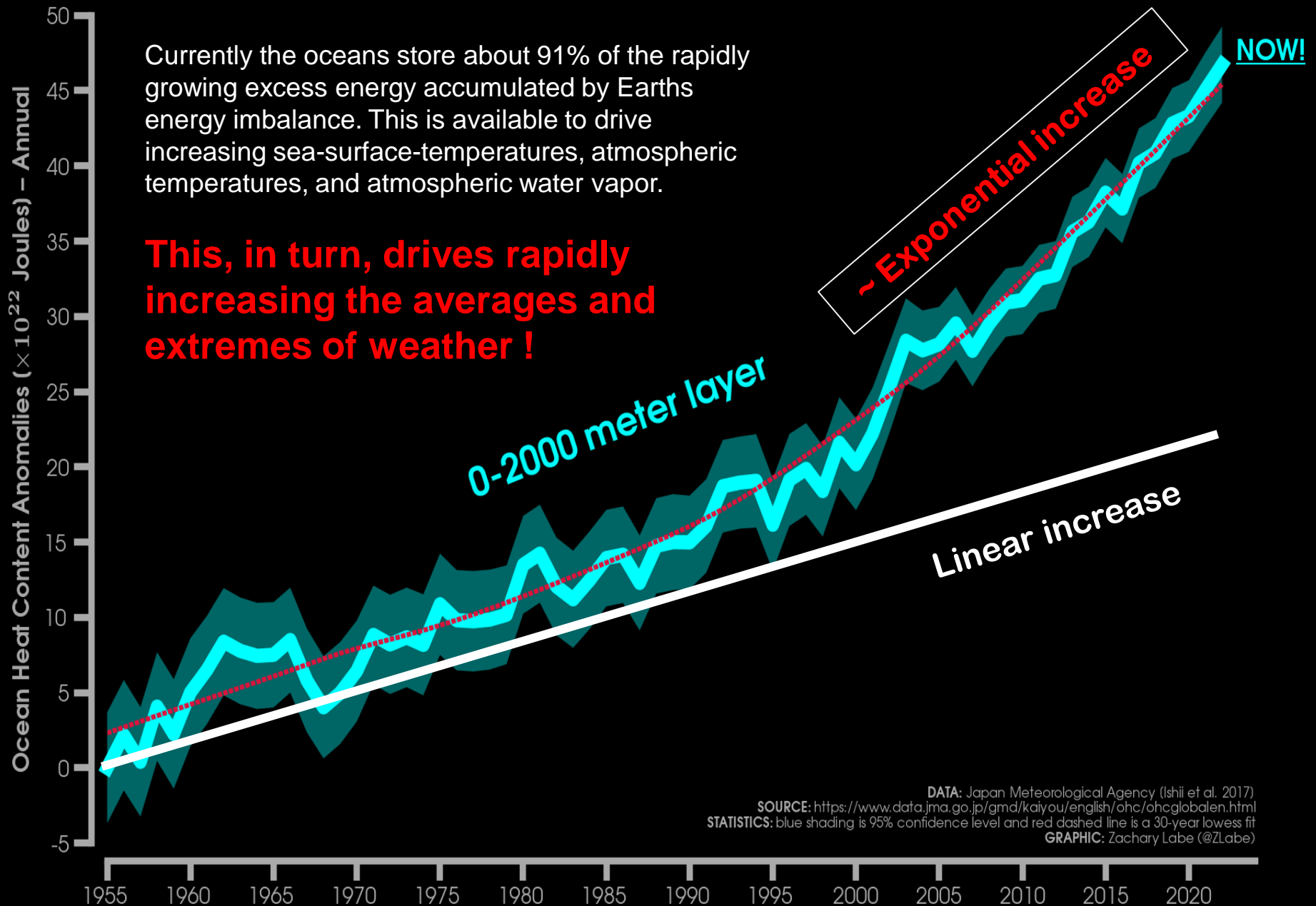
Feb. 2001 - April 2023



CHANGE IN GLOBAL OCEAN HEAT CONTENT SINCE 1955

Currently the oceans store about 91% of the rapidly growing excess energy accumulated by Earth's energy imbalance. This is available to drive increasing sea-surface-temperatures, atmospheric temperatures, and atmospheric water vapor.

This, in turn, drives rapidly increasing the averages and extremes of weather !



**IF NOTHING IS DONE TO REVERSE THIS,
GLOBAL MASS EXTINCTION
OF MOST COMPLEX LIFE
INCLUDING HUMANS
IS LIKELY WITHIN A CENTURY**

I do not think the situation is hopeless.

**15 years intensive study of the coevolution of humans
and our exponentially growing technologies tells me that
with an emergency mobilization we may still have the
capacity through stopping emissions, drawing down and
sequestering greenhouse gases, and increasing Earth's
reflectivity to begin global cooling soon enough
to maintain a marginally livable world.**

Where hope for the future is concerned consider this:

Beginning in the mid 18th Century with the invention of steam-punk coal-burning technology, it took all of mankind around 250 years burn a big enough fraction of fossil carbon accumulated over hundreds of millions of years to change our atmosphere enough to trigger runaway warming to Earth's Hothouse Hell, where most of the carbon is in the atmosphere rather than the ground where it should be.

In that same ~250 years human technologies and scientific understanding of our planet has grown exponentially far faster than our burning of carbon has grown. Surely, with sufficient coordination and cooperation we should be able to recapture the atmospheric carbon to put it back in the ground, and to do other things to push the planetary energy imbalance into negative territory for a while to cool things down a bit.

In 1939 America was fragmented and isolationist almost as badly as America is today, and I'm old enough to remember blackouts, rationing, and the comprehensive ending of total war.

Crystallized by the bombing of Pearl Harbor 07/12/1941, an America crippled by the Depression and isolationism; mobilized, invented new sciences and technologies, performed miracles of organization, logistics, and construction to comprehensively win WWII; and within a few more years via the Marshall Plan, restore many of the exhausted combatants to prosperity.

Humans have the capacity to cooperate massively

Humans cannot do what is needed as long as our governments continue (1) protecting and subsidizing fossil fuel and other GHG emitting industries and (2) penalizing and suppressing climate activism that prevents us from leaving the downhill road to Hothouse Hell

As Dr Andrew Forrest (i.e., “Twiggy”) has stated so strongly in addresses given at the [Boao Asia Forum](#) Perth, Aug 30 and a [Special Lecture](#) Oxford Uni Oct 9
In his concluding words at Boao

You – the public or individual....
**... Business guided by government will either
destroy or save this planet.**
Hold us to account, the power of You!
.... Make us change....

To avoid human extinction
and to leave our grandchildren with a world where they can survive

We must totally and globally mobilize whatever it takes to reverse the
global energy imbalance so our planet can cool down a bit.

Only governments can work at this scale.

But they won't as long as they remain captured by the self-interests
of greedy billionaires and vested corporations looking for corporate
profits at the expense of all else.

**To have any hope, we must first release
our captured governments from their
puppet masters, and
convince them to work for us!**



Make **climate** the winner at every election

“We need to treat the climate emergency as a global war we are on track to lose unless we can focus our efforts on the only task that matters — reversing global warming. If we fail here no other tasks matter — our species will soon end up extinct no matter how we arrange the deck chairs on the burning ship.”

William P. Hall – Evolutionary Biologist & Vote Climate One committee member

ACT NOW

“We need to treat the climate emergency as a global war we are on track to lose unless we can focus our efforts on the only task that matters — reversing global warming. If we fail here no other tasks matter — our species will soon end up extinct no matter how we arrange the deck chairs on the burning ship.”

William P. Hall – Evolutionary Biologist & Vote Climate One committee member

Vote Climate One was formed in the Macedon Ranges with the specific aim of changing governments to favor effective climate action.

Our knowledge was built on lifetimes of life experiences of the old codgers living on their pensions and super (if any), who found we could work together for common goals, including:

teaching, mud-brick and pizza making, evolutionary biology, house building, systems engineering, organizational knowledge management, serial organizing;

through personal involvements in political organizations:

pre 1980 USA Republican politics, Liberal Party (Fraser & Hamer), Labor Party, Greens, Forum for Democratic Renewal, Extinction Rebellion

and political campaigns:

local council elections and policies, state elections (Victoria, NSW), federal elections (in all states), by-elections (we're prepared to do them all!)

Our original goal – which has not changed ! – is to elect people to replace puppet politicians representing greedy special interests.

However, if we have to wait until the next series of elections to do this, it will probably be too late to be physically able to stop and reverse runaway warming that has already started.

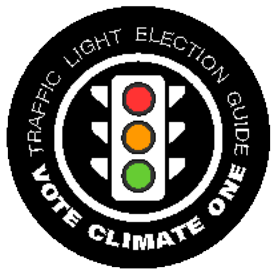
**We have to change the minds of puppet MPs
– *fast!* –**

Break the strings that have captured them!

Towards this end we are working with a few of the more political of the more political climate and environment action groups to build a coalition of all C&E action groups willing to collaborate synergistically

Collectively such groups have millions of citizen voters on their mailing lists.

MPs minds will be changed if thousands or tens of thousands of voters in their electorates demand changes on penalty of losing office if the demands are not met



We few do a lot with very limited resources

We could do much more with more human and financial resources ! Additional participation welcome

Links to further information mostly authored/organized by me:

- VoteClimateOne.org – what we do and how we do it.
- [Climate Sentinel News](#) – as much as I have time to write on the climate crisis (other authors welcome !)
- [Sept. 2023 climate extremes](#) – Notable observations and news items, with no processing and little in the way of comment. Derna was only one in a horrifying stream of ‘unprecedented’ events
- [Billionaires & action groups can save the world together!](#) – Background on Forrest’s address to Boao
- [Accelerating Action: A roadmap for global action through APEC and out to COP 28](#) with Dr Andrew Forrest; [Special Lecture](#) Oxford Uni Oct 9 – only link I could find to Forrest’s actual address; Accelerating Action also has a lower quality video with extended Q&A
- [Australian MPs: Act now! Later may be too late!](#) – Part of a package delivered to all sitting MPs
- [Cover letter associated with the above](#) – Explains to the recipients the importance of the information
- [Global climate change now](#) – Emergency conditions as at 16/07/2023 (see Sept. update above – as of today (19/10/2023) planetary average indicators have continued to grow even more alarming)
- [Portents for the future – 2020 wildfires on the Siberian Permafrost](#) – rapid growth of wildfires adding more GHGs to the atmosphere faster than we are reducing ours.
- [Natural Resources Canada – Fire M3 hotspots](#) – scroll to the end to see a much worse situation just finishing in the Canadian arctic and subarctic forests and tundra than in 2020 Siberia.
- [Some fundamental issues relating to the science underlying climate policy: The IPCC and COP26 couldn't help but get it wrong](#) – Detailed analysis of why the IPCC cannot help but underplay the existential dangers global warming represents to humanity
- [Emergence and evolution of community voices in Australian politics - The Teal Tsunami started in Indi \(Rev03\)](#) – How community independents (‘teals’) can be elected and are changing the nature of Australian politics.
- [Homo habilis to Homo destructor - How the rise of tool-making apes can destroy the world](#)