

Craters and Airbursts

- Most asteroids and comets fragments explode in the air as fireballs or airbursts; only the largest ones make craters.
- Evidence indicates that the YDB impact into the Canadian ice sheet made ice-walled craters that melted away long ago.
- The YDB impact also possibly created rocky craters, most likely along the edge of the ice sheet in Canada or underwater in the oceans.
- Our group is planning expeditions to search for impact evidence and hidden craters, for example to North Dakota, Montana, Quebec, and Nova Scotia.

The following pages show what could happen during an impact

NOTE: this website is a brief, non-technical introduction to the YDB impact hypothesis. For in-depth information, go to “Publications” to find links to detailed scientific papers.

Meteor Showers

Comet impacts are common, but usually, they are harmless

- Earth is hit by 109 meteor showers every year (listed at right), averaging 2 collisions with streams each week
- Oddly, most “meteor showers” are not from meteorites or asteroids, but rather are fragments of broken-up comets
- Most comet fragments are small, but some range from the size of a house to many kilometers wide, posing a major threat to Earth

NAME OF SHOWER

Alpha Aurigids
Alpha Bootids
Alpha Capricornids
Alpha Carinids
Alpha Centaurids
Alpha Crucids
Alpha Cygnids
Alpha Hydrids
Alpha Monocerotids
Alpha Scorpiids
Aries-triangulids
Arietids
Beta Corona Austrinids
Chi Orionids
Coma Berenicids
Delta Aurigids
Delta Cancrids
Delta Eridanids
Delta Leonids
Delta Pavonids
Delta Velids
Epsilon Geminids
Eta Aquariids
Eta Carinids
February Leonids
Gamma Doradids
Gamma Normids
Gamma Velids
Geminids
Giacobinids
July Pegasids
July Phoenicids
June Bootids
June Lyrids[2]
Kappa Aquariids
Kappa Cygnids

NAME OF SHOWER

Leo Minorids
Leonids
Librids
Lyrids
Monocerotids
Mu Virginids
Northern Delta Aquariids
Northern Iota Aquariids
Northern Taurids
October Arietids
Omega Capricornids
Omega Scorpiids
Omicron Centaurids
Orionids
Perseids
Phoenicids
Pi Eridanids
Pi Puppids
Piscids
Piscis Austrinids
Puppids-velids
Quadrantids
Sagittarids
September Perseids
Sigma Capricornids
Sigma Hydrids
Southern Delta Aquariids
Southern Iota Aquariids
Southern Taurids
Tau Aquariids
Tau Cetids
Theta Centaurids
Theta Ophiuchids
Ursids
Virginids
Zeta Puppids

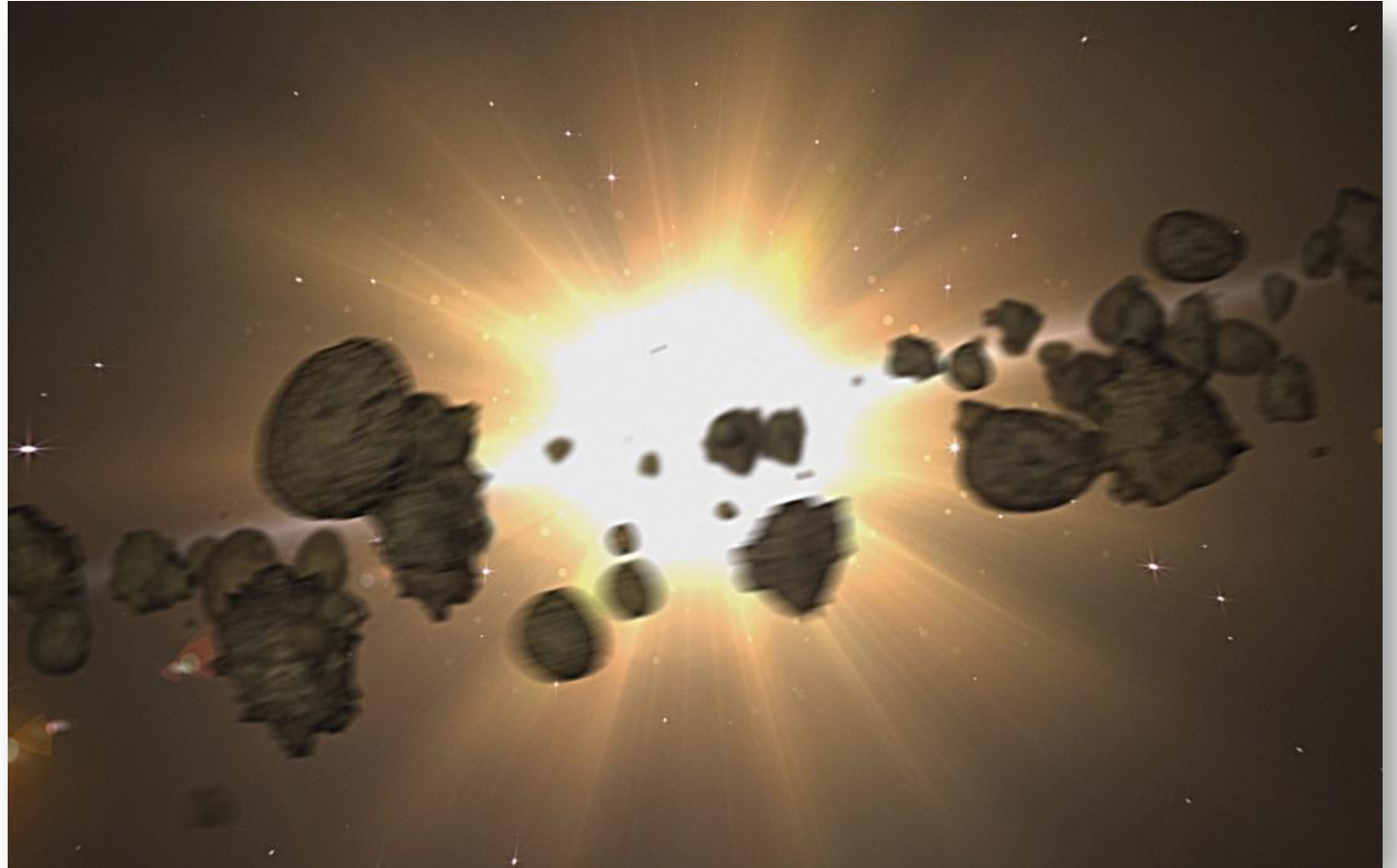
Examples of small space objects orbiting the Sun

COSMIC SHOOTING GALLERY

NASA reports that Earth is directly in the path of about **500,000 asteroids and comets**, ranging in diameter from as big as a house to the size of a football field. The largest ones would produce explosions far worse than the world's largest atomic bombs and are capable of obliterating Earth's cities.

WHAT IS THE DANGER?

NASA says there is little danger -- but do you want to know the chilling truth? They don't know the location of **498,000** of them! A house-sized comet could be headed for one of Earth's cities today, and no one will know it is coming.



Artist's concept of asteroid belt

Credit: Alexey Komarenko | Dreamstime.com

Examples of large, dangerous space objects orbiting the Sun



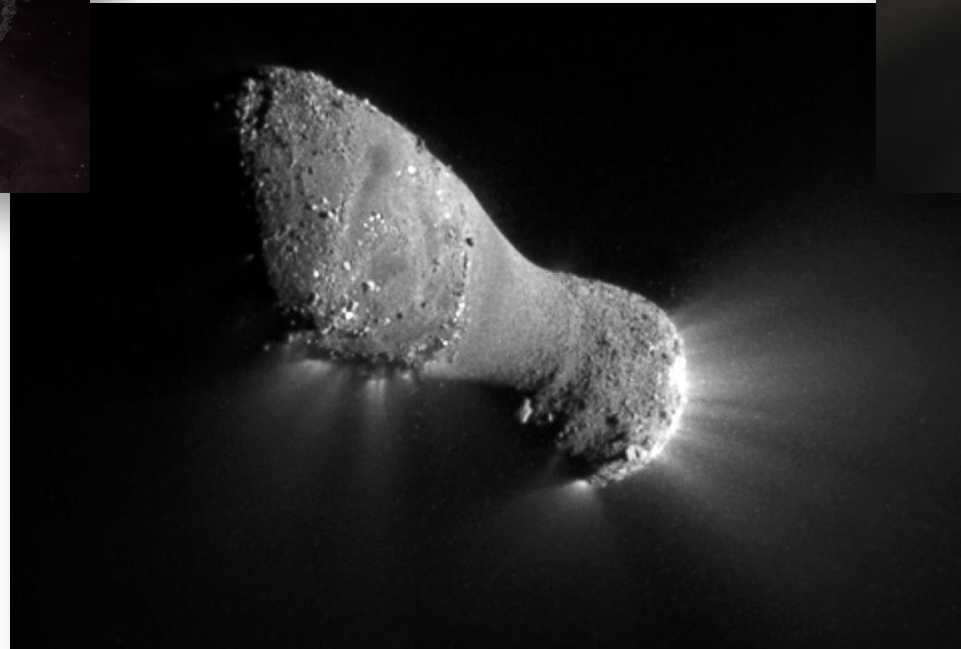
Artist's concept of
dinosaur-killing asteroid,
10 km wide (6 miles),
(credit: NASA/JPL-Caltech)

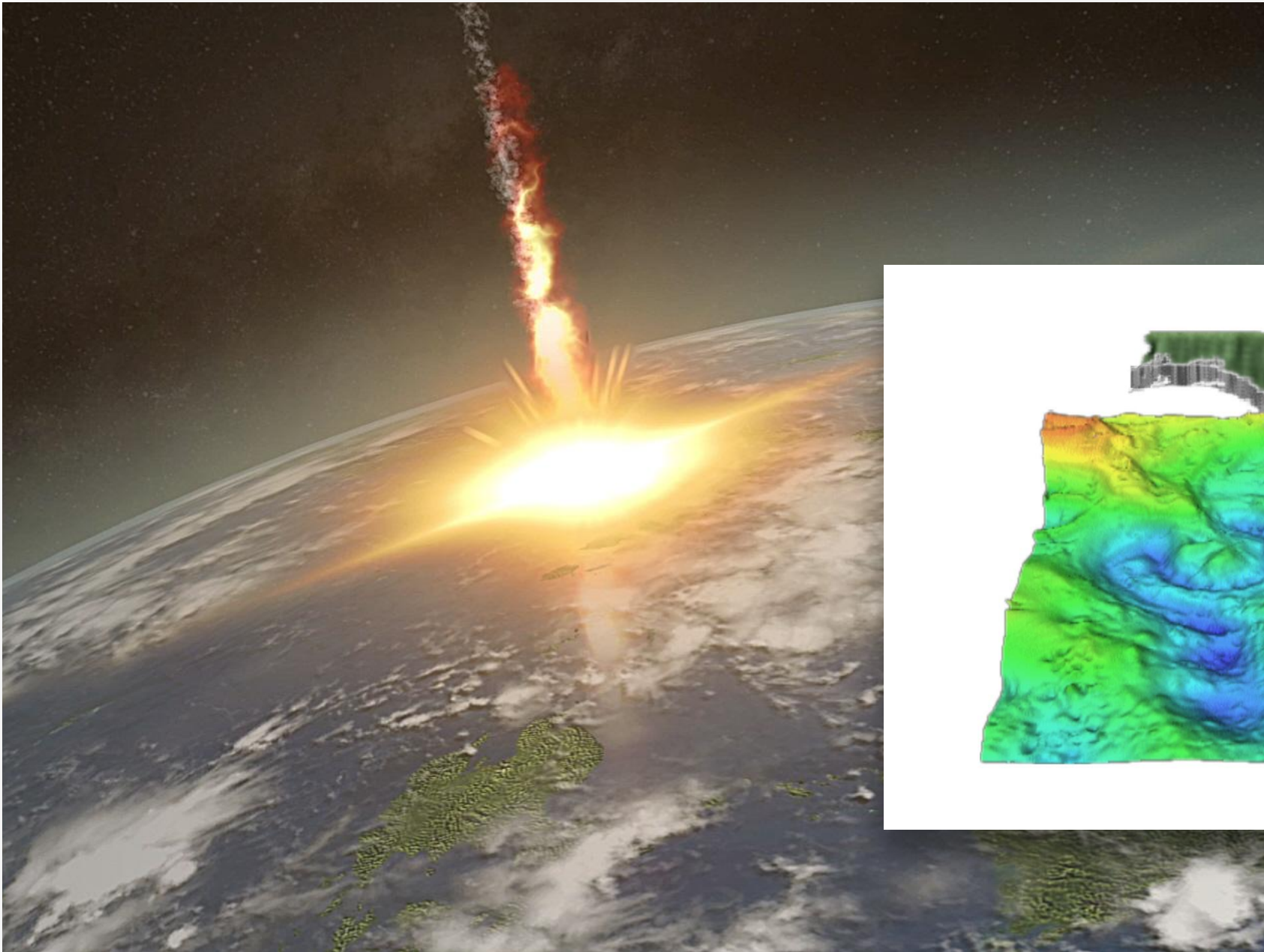
If objects the size of these hit
Earth, the results would be
catastrophic for humankind

Comet Hartley 2,
1.5 km wide (1 mile)
(credit: NASA/JPL-Caltech)

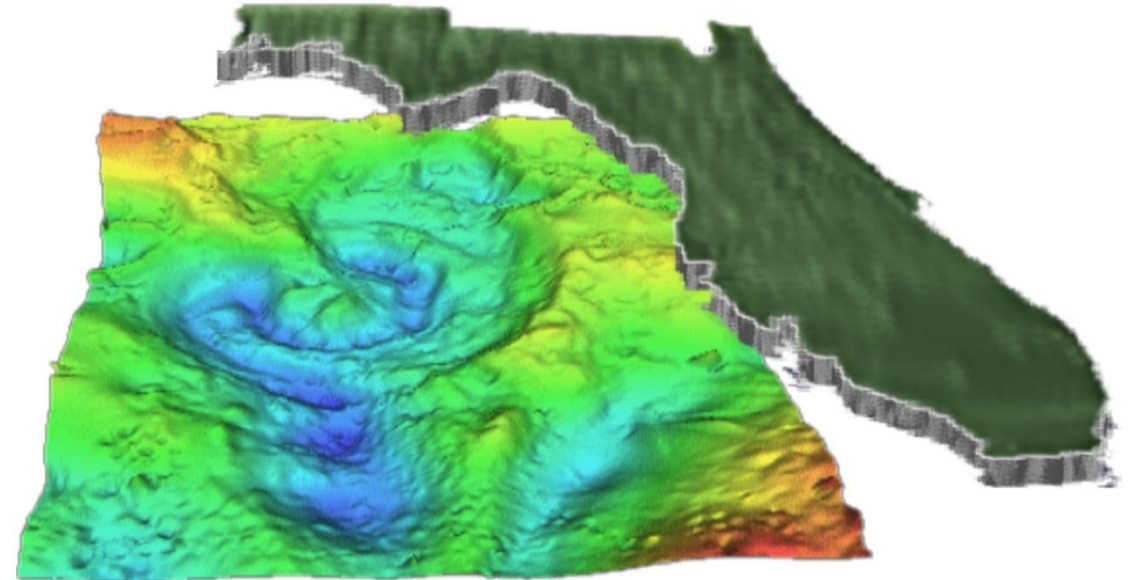


Comet Tempel-Tuttle,
4 km wide (2.5 miles)
(credit: NASA/JPL-Caltech)





Object that was
10 km wide (6 miles)
crashed into Mexico
66 million years ago



Credit: NASA/JPL-Caltech

It produced a crater that is
180 kilometers wide (110 miles),
or wider than Florida

Credit: Dreamstime.com

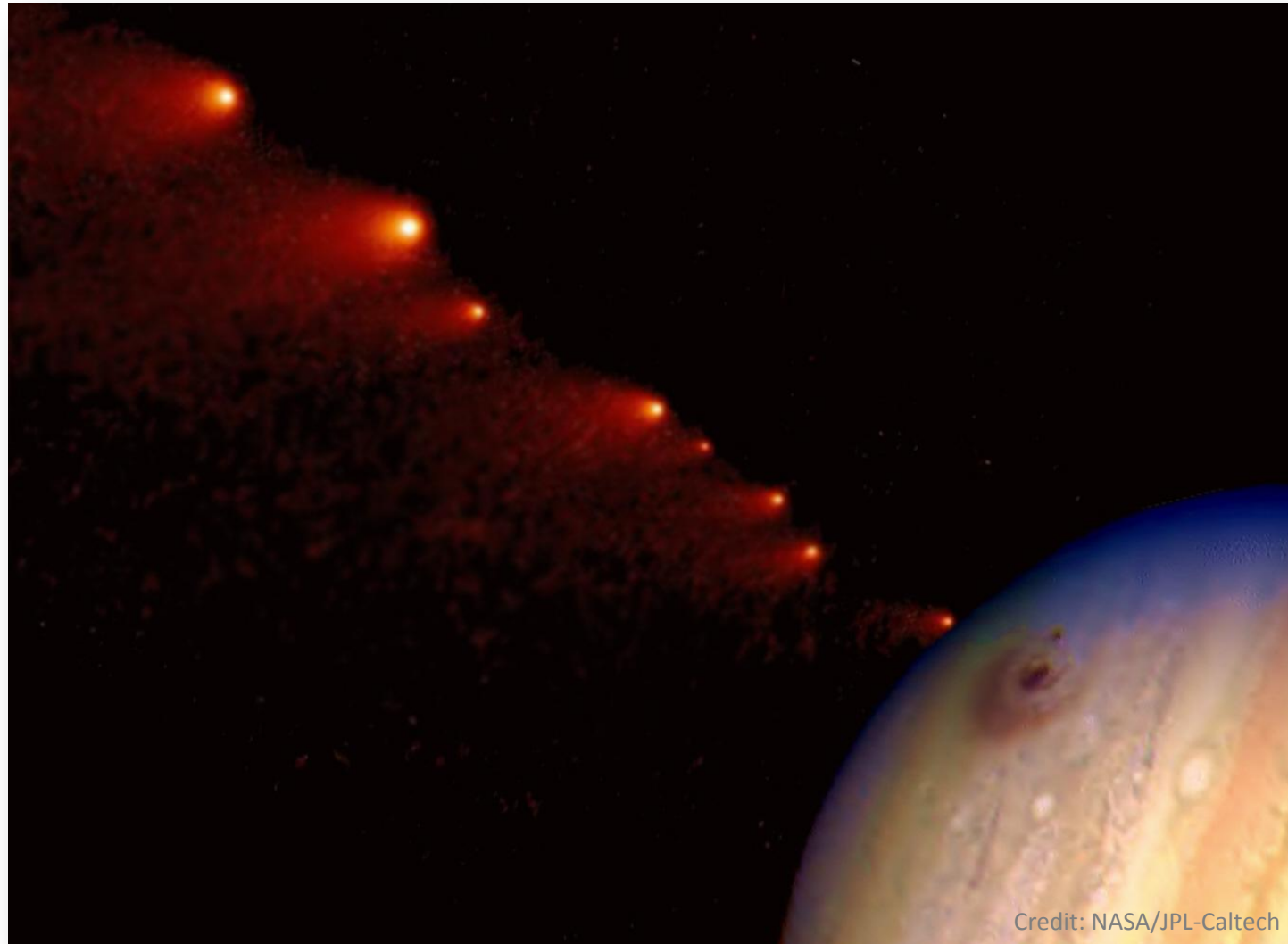
**The impact forced millions of dinosaurs into extinction,
along with much of the rest of life on Earth**



Credit: Pond5.com

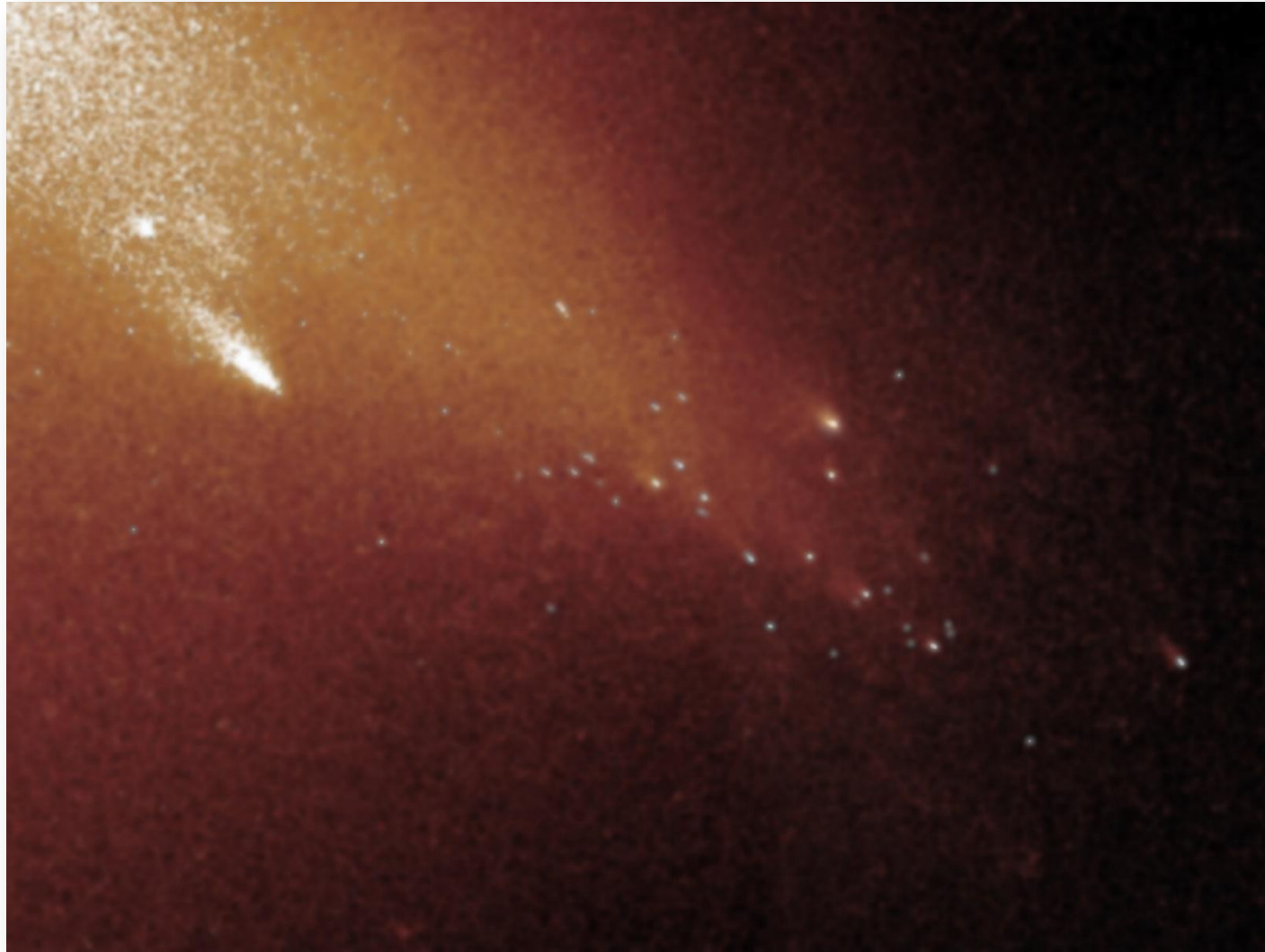
Dangerous impacts are more common than we have been taught

50 broken-up comets have been discovered in the last 150 years, or a new one every 3 years. Comet Shoemaker-Levy, a large broken-up comet, hit Jupiter in 1994, leaving a dark scar wider than Earth.



Credit: NASA/JPL-Caltech

This is Comet LINEAR, broken into dozens of large pieces
If a comet fragments like this hit Earth, the effects would be catastrophic



Credit: NASA/JPL-Caltech

Tunguska Airburst

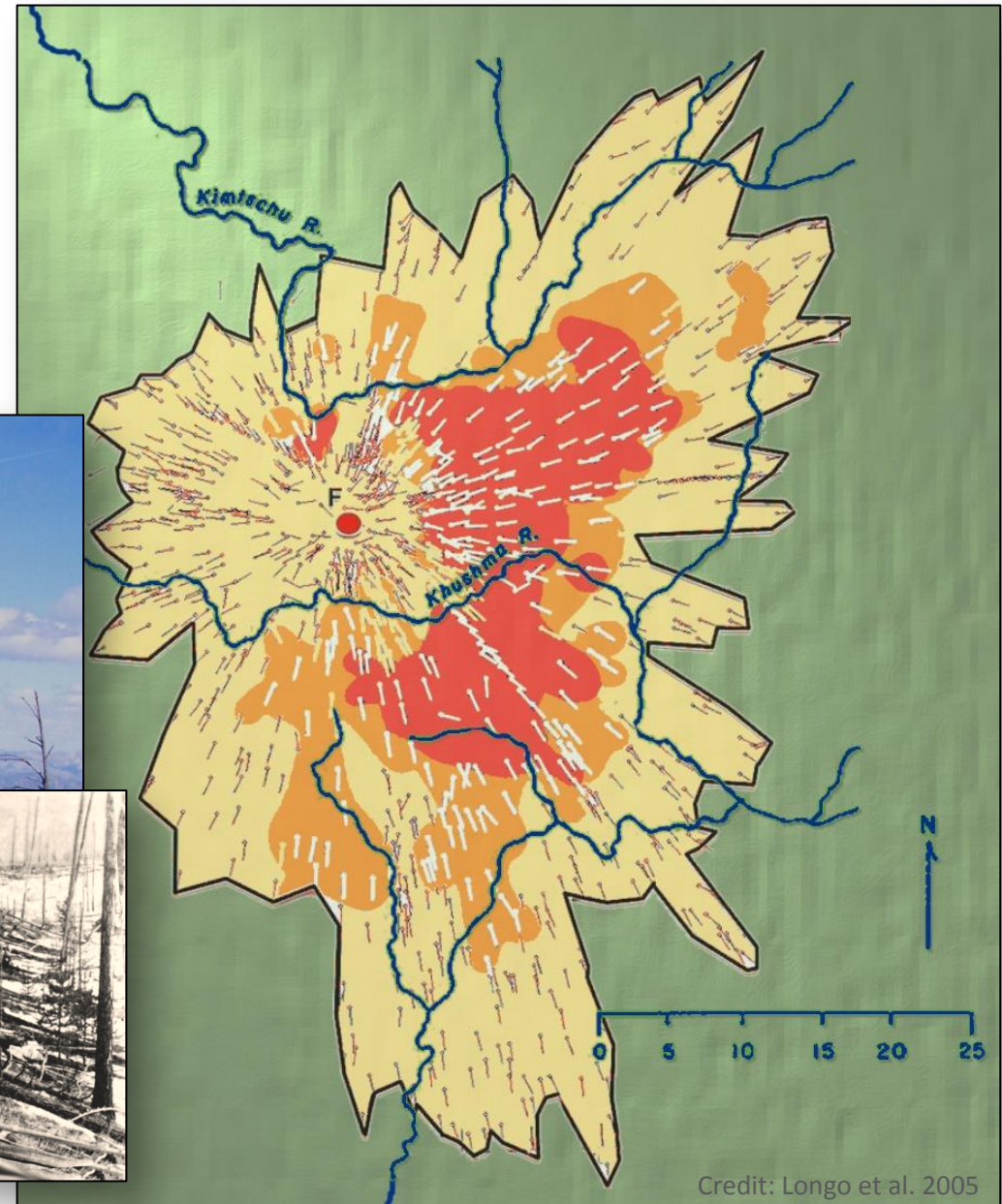
A house-sized space object blew up over Russia in 1908. It knocked down 80 million trees that radiated outward in a “butterfly” pattern (right). The blast started raging wildfires and produced nanodiamonds, melted spherules, and meltglass.



Credit: Pond5.com



Credit: Wikipedia.com



Credit: Longo et al. 2005

Relative size of Tunguska Airburst

The Tunguska blast area is shown superimposed on nighttime satellite images. The blast was larger than downtown New York City, London, and Tokyo. If a similar blast occurred those, cities today would be demolished.



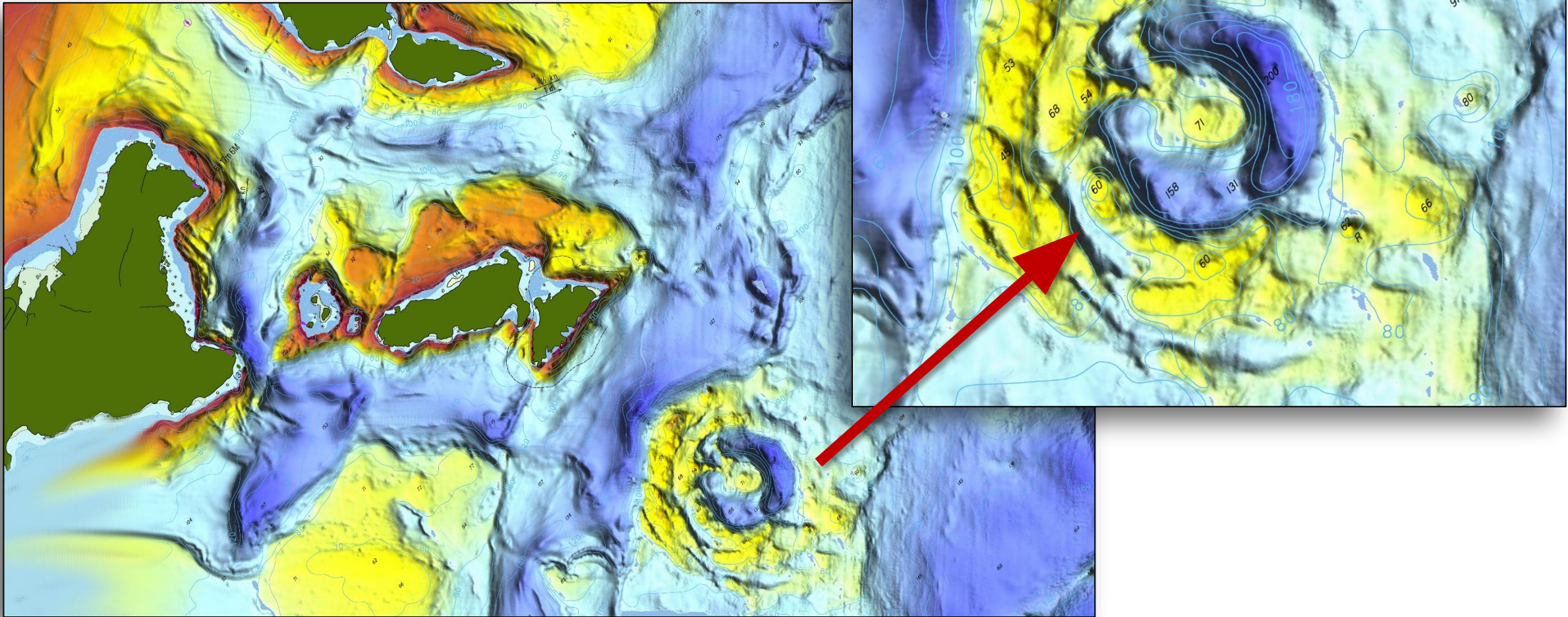
Artist's composite image of Younger Dryas comet impact

Thousands of large pieces collided with Earth, causing explosions like atomic bombs



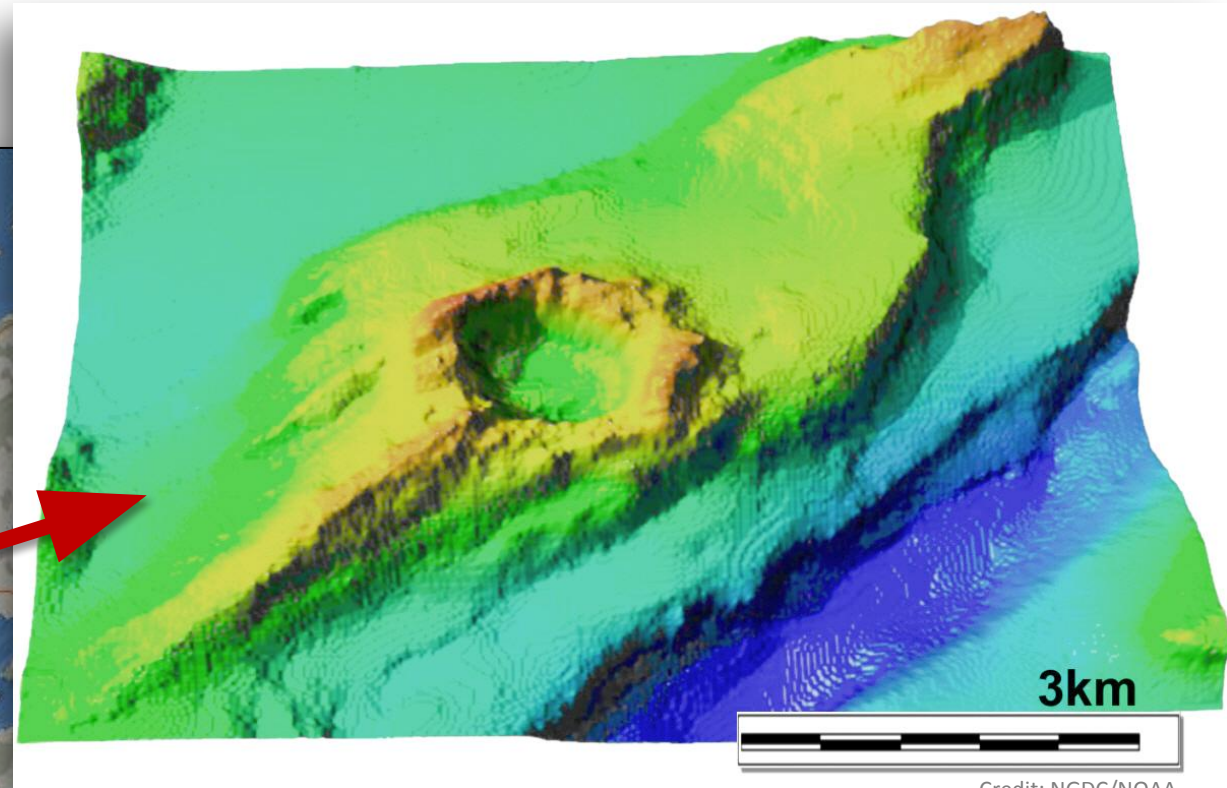
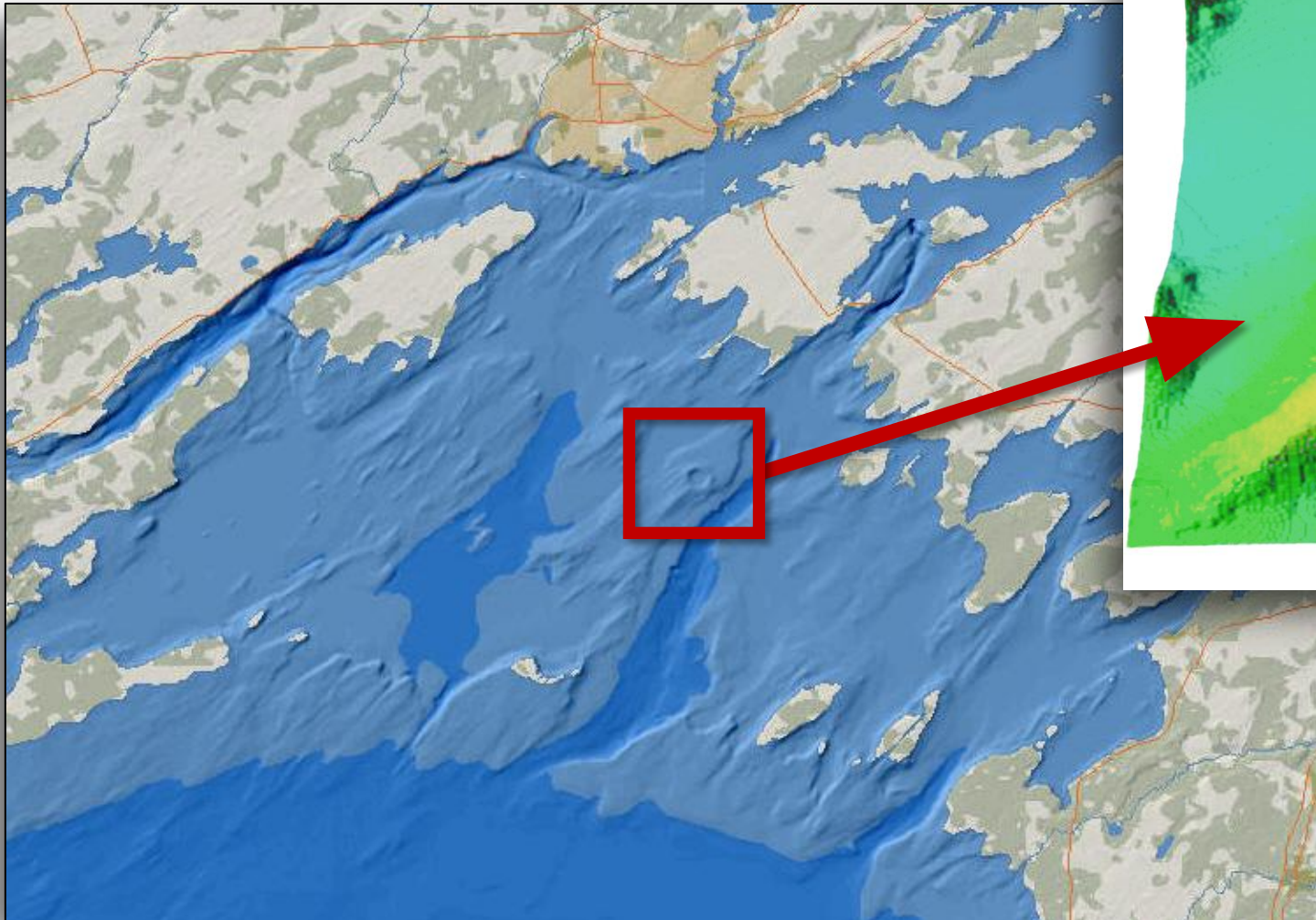
Potential YDB impact crater in SE Canada:

Corossol crater; 4 km wide (2.5 miles). Made by object about 500 meter wide (1600 feet). Age is about 12,800 yrs ago (or older). We plan to travel there to take samples.



Credit: Canadian Hydrographic Service

Potential YDB impact crater under Lake Ontario: Charity Shoal crater is about 1 km wide (0.6 miles). Impactor was about 150 meter wide (500 ft). Age is about 12,800 yrs ago (or older).



Credit: NGDC/NOAA

Credit: NGDC/NOAA

Are the craters the right age?

The scientists who studied Corossol and Charity Shoal craters don't know their true ages, but concluded that both could be about 12,800 years old.

To try to determine the age, we plan to take samples at each site in the near future.

Both craters may have been created by fragments of the same 12,800-year-old object that spread impact evidence across at least 4 continents.