



PHOTON
PHRIGHTDAY

1
00:00:05,972 --> 00:00:09,409
The death of an island
is a common occurrence on our Earth.

2
00:00:09,409 --> 00:00:13,380
And today ICESat-2, our satellite lidar

3
00:00:13,380 --> 00:00:17,350
altimetry system, can see
and watch these spectacular places.

4
00:00:17,350 --> 00:00:22,055
It's almost spooky
because islands are part of the glimmers

5
00:00:22,055 --> 00:00:25,325
of how the Earth works
in the giant oceanic environment.

6
00:00:25,325 --> 00:00:28,495
So let's take a look
at one of these island systems in a remote

7
00:00:28,495 --> 00:00:32,532
part of the Southwest Pacific,
known as the Kingdom of Tonga,

8
00:00:32,532 --> 00:00:36,870
and this island archipelago is special
because it has lots of volcanoes.

9
00:00:36,870 --> 00:00:42,509
Recently, ICESat-2 was able to produce
topography of one of these islands.

10
00:00:42,509 --> 00:00:46,312
A recently formed one known as Hunga
Tonga Hunga Ha'apai

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00:00:46,312 --> 00:00:49,816

in the Southwest Pacific
and this island, only a couple

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00:00:49,816 --> 00:00:53,953

hundred hectares in extent, was burst
from the shallow waters

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00:00:53,953 --> 00:00:57,891

oceans of this part of the Pacific
about six years ago.

14

00:00:57,891 --> 00:01:03,830

It constructed a 120-meter high volcano
and that volcanic island's

15

00:01:03,830 --> 00:01:07,667

been crumbling against the barrage
of forces of the ocean

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00:01:07,667 --> 00:01:10,637

and tropical cyclones
over the last six years.

17

00:01:10,637 --> 00:01:15,075

ICESat-2 was able to see that island
with the finest scale

18

00:01:15,075 --> 00:01:19,179

precision of satellite laser
altimetry possible

19

00:01:19,179 --> 00:01:22,715

and show us the structure of the island
as it's crumbling.

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00:01:23,183 --> 00:01:28,321

What ICESat-2 shows us the shallow crater
lake that formed as the volcano

21

00:01:28,321 --> 00:01:33,493
was erupting and then filled with ocean
water is only ten or 15 meters deep.

22

00:01:33,760 --> 00:01:38,098
It reflects what might be the volcanic
vent system that led to the formation

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00:01:38,098 --> 00:01:39,532
of this special island.

24

00:01:44,270 --> 00:01:47,073
Now, other islands in the Tonga system

25

00:01:47,173 --> 00:01:52,946
haven't survived as well, and one erupted
beautifully in the fall of 2019.

26

00:01:52,946 --> 00:01:54,647
And that island, which is named

27

00:01:54,647 --> 00:01:58,518
Late'iki, formed a new island
just several meters above sea level

28

00:01:58,518 --> 00:02:03,223
that was then witnessed by ICESat-2
a few months after the island washed away.

29

00:02:03,656 --> 00:02:08,495
And what's left are the remnant shoals
of a region that's very active.

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00:02:08,495 --> 00:02:13,967
The tip of a three kilometer,
10,000 foot undersea volcano

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00:02:13,967 --> 00:02:18,705
that pops its head above
and below the waves every decade or two.

32

00:02:19,606 --> 00:02:24,244

The death of islands is like the ghostlike
relics of what the Earth once was.

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00:02:24,244 --> 00:02:27,347

And we know there's thousands
of these things on the ocean