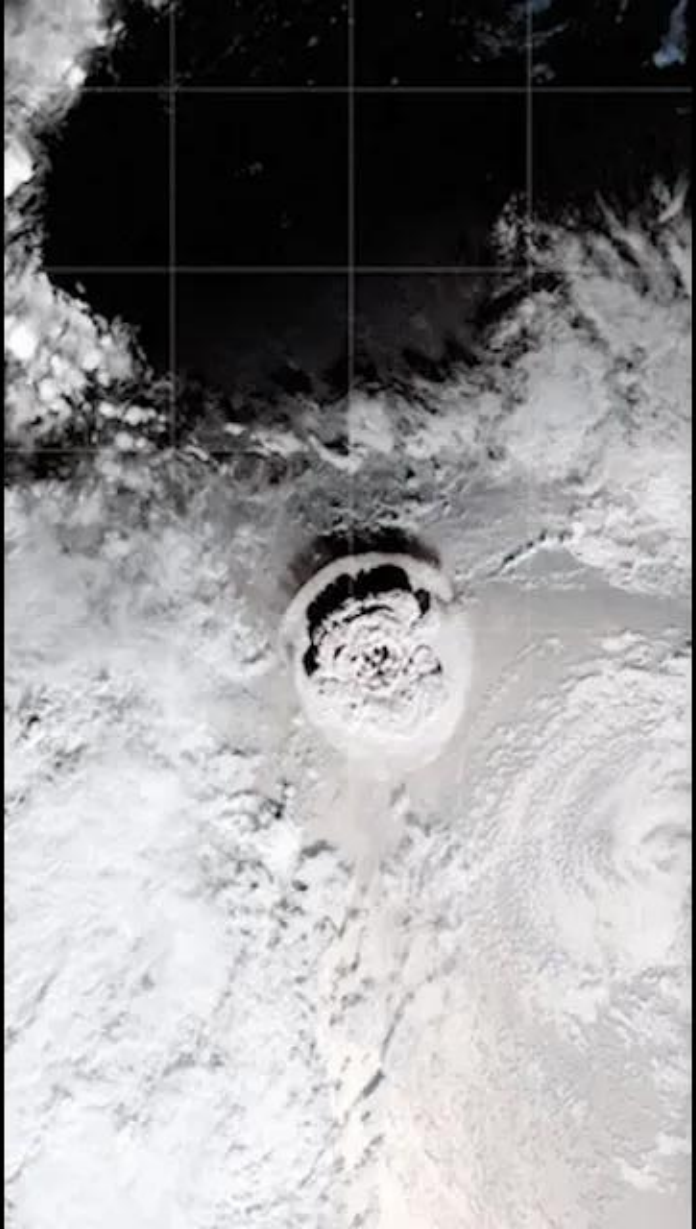

1
00:00:07,730 --> 00:00:05,210
on January 15 2022 the uninhabited

2
00:00:10,549 --> 00:00:07,740
volcanic island hungatanga hunger Hape

3
00:00:14,030 --> 00:00:10,559
erupted violently creating worldwide

4
00:00:15,829 --> 00:00:14,040
shock waves Sonic booms tsunamis and

5
00:00:17,689 --> 00:00:15,839
powerful winds all while blanketing

6
00:00:19,250 --> 00:00:17,699
surrounding Islands in two centimeters

7
00:00:21,769 --> 00:00:19,260
of Ash

8
00:00:23,810 --> 00:00:21,779
it was a fatal eruption and its impact

9
00:00:26,090 --> 00:00:23,820
on nearby communities was further

10
00:00:28,750 --> 00:00:26,100
compounded by the disruption cause to

11
00:00:31,009 --> 00:00:28,760
Emergency Services

12
00:00:33,110 --> 00:00:31,019
NASA has been following the Pacific

13
00:00:35,630 --> 00:00:33,120

Island's unusual Evolution for years

14
00:00:37,790 --> 00:00:35,640
using historical observations and

15
00:00:40,190 --> 00:00:37,800
satellite data of the January eruption

16
00:00:42,410 --> 00:00:40,200
scientists have shed a new light on why

17
00:00:44,630 --> 00:00:42,420
this explosion is so unique and how such

18
00:00:46,790 --> 00:00:44,640
a small island is making such a huge

19
00:00:50,330 --> 00:00:46,800
impact across the planet

20
00:00:52,190 --> 00:00:50,340
it gave us a window into a rapid-paced

21
00:00:54,290 --> 00:00:52,200
life history of an island that we can

22
00:00:56,869 --> 00:00:54,300
compare to hundreds of other islands in

23
00:00:58,729 --> 00:00:56,879
the oceans over time and these islands

24
00:01:00,470 --> 00:00:58,739
are sensitive indicators for the

25
00:01:02,330 --> 00:01:00,480
activities of climate environmental

26
00:01:04,789 --> 00:01:02,340
change and we can project them forward

27
00:01:06,469 --> 00:01:04,799
even to other planets so what an

28
00:01:08,929 --> 00:01:06,479
opportunity

29
00:01:10,789 --> 00:01:08,939
geologic records suggest that while the

30
00:01:13,190 --> 00:01:10,799
volcano may have produced massive

31
00:01:14,990 --> 00:01:13,200
explosive eruptions in the past an

32
00:01:16,789 --> 00:01:15,000
eruption of this magnitude wasn't

33
00:01:18,590 --> 00:01:16,799
expected so soon

34
00:01:21,410 --> 00:01:18,600
this was what we call a volcanic

35
00:01:23,929 --> 00:01:21,420
explosivity index six eruption nothing

36
00:01:26,330 --> 00:01:23,939
like it since Krakatoa in the 19th

37
00:01:28,490 --> 00:01:26,340
century and so what happened was this

38
00:01:31,670 --> 00:01:28,500

beautiful little island 100 meters tall

39
00:01:35,210 --> 00:01:31,680
growing forming by the nature of the way

40
00:01:38,090 --> 00:01:35,220
volcanoes and and water interact was

41
00:01:40,490 --> 00:01:38,100
explosively changed forever and

42
00:01:44,149 --> 00:01:40,500
literally the entire base of the volcano

43
00:01:46,990 --> 00:01:44,159
fell hundreds of meters in to a shallow

44
00:01:50,030 --> 00:01:47,000
magma Reservoir a liquid rock chamber

45
00:01:52,609 --> 00:01:50,040
literally under the ocean and that

46
00:01:54,710 --> 00:01:52,619
allowed the explosive interaction of a

47
00:01:58,130 --> 00:01:54,720
massive Pacific Ocean sea water with

48
00:02:00,710 --> 00:01:58,140
this hot rod 1300 degrees Kelvin that's

49
00:02:03,050 --> 00:02:00,720
super hot hotter than your oven and that

50
00:02:06,289 --> 00:02:03,060
explosion with the pressure moved the

51
00:02:07,550 --> 00:02:06,299
water the rock the small amounts of Ash

52
00:02:09,770 --> 00:02:07,560
that were part of building the island

53
00:02:12,470 --> 00:02:09,780
all the way into the atmosphere and

54
00:02:14,449 --> 00:02:12,480
triggered a large tsunami a 15 meter

55
00:02:17,150 --> 00:02:14,459
High super wave that traveled out

56
00:02:19,369 --> 00:02:17,160
hundreds of miles buried some low local

57
00:02:21,350 --> 00:02:19,379
Islands as part of the Tonga archipelago

58
00:02:24,350 --> 00:02:21,360
but allowed us to see the power of

59
00:02:26,750 --> 00:02:24,360
Mother Nature's volcanoes when water and

60
00:02:28,130 --> 00:02:26,760
liquid rock come together to shape our

61
00:02:30,650 --> 00:02:28,140
planet

62
00:02:33,650 --> 00:02:30,660
NASA and Esa satellites clocked wind

63
00:02:35,869 --> 00:02:33,660

speeds up to 450 miles per hour just

64
00:02:38,690 --> 00:02:35,879
hours after the eruption and showed

65
00:02:41,210 --> 00:02:38,700
material rising up to 36 miles the

66
00:02:43,369 --> 00:02:41,220
highest volcanic plume ever measured

67
00:02:45,290 --> 00:02:43,379
within two weeks the main plume of

68
00:02:47,750 --> 00:02:45,300
volcanic materials circled the entire

69
00:02:49,729 --> 00:02:47,760
Globe injecting dust particles into the

70
00:02:50,630 --> 00:02:49,739
stratosphere that remained for upwards

71
00:02:53,089 --> 00:02:50,640
of a year

72
00:02:54,710 --> 00:02:53,099
NASA also found that the volcano

73
00:02:57,050 --> 00:02:54,720
injected a tremendous amount of water

74
00:02:59,270 --> 00:02:57,060
vapor into the Earth's stratosphere the

75
00:03:01,610 --> 00:02:59,280
increase of water vapor which traps heat

76
00:03:03,350 --> 00:03:01,620
could modify atmospheric chemistry and

77
00:03:06,070 --> 00:03:03,360
have a warming effect on the Earth's

78
00:03:11,089 --> 00:03:09,229
so outside of its sheer magnitude what

79
00:03:13,009 --> 00:03:11,099
makes this eruption so unique

80
00:03:16,130 --> 00:03:13,019
well it's really a matter of our ability

81
00:03:17,930 --> 00:03:16,140
to see it at the end of 2021 the

82
00:03:19,130 --> 00:03:17,940
Island's volcanic activities started

83
00:03:21,410 --> 00:03:19,140
picking up

84
00:03:23,630 --> 00:03:21,420
small underwater eruptions began to

85
00:03:26,089 --> 00:03:23,640
reshape the Island's landscape expanding

86
00:03:28,009 --> 00:03:26,099
the island these shallow water events

87
00:03:30,710 --> 00:03:28,019
are classified as certain eruptions

88
00:03:32,270 --> 00:03:30,720

where hot magma interacts explosively

89
00:03:34,550 --> 00:03:32,280
with water

90
00:03:36,470 --> 00:03:34,560
in other words we've been able to see

91
00:03:38,750 --> 00:03:36,480
the birth of the island happen in ways

92
00:03:41,210 --> 00:03:38,760
we haven't been able to before and with

93
00:03:43,130 --> 00:03:41,220
modern satellite technology we're also

94
00:03:45,890 --> 00:03:43,140
able to see the end of the Island's life

95
00:03:47,449 --> 00:03:45,900
cycle in new detail as we did with the

96
00:03:49,369 --> 00:03:47,459
January eruption

97
00:03:51,710 --> 00:03:49,379
this has happened in Earth history in

98
00:03:54,530 --> 00:03:51,720
famous places like Yellowstone topple

99
00:03:56,750 --> 00:03:54,540
New Zealand Krakatoa and now in the

100
00:03:59,330 --> 00:03:56,760
island nation of Tonga it's a weaving

101
00:04:01,630 --> 00:03:59,340
opportunity 21st century techniques

102
00:04:03,770 --> 00:04:01,640
laser altimeters like ice tattoo

103
00:04:05,990 --> 00:04:03,780
satellite techniques that can see at

104
00:04:08,869 --> 00:04:06,000
Scales of sub-meter put those together

105
00:04:10,670 --> 00:04:08,879
and tell a story of the birth and death

106
00:04:13,130 --> 00:04:10,680
of this island

107
00:04:15,229 --> 00:04:13,140
NASA's vantage point of hungatanga

108
00:04:16,969 --> 00:04:15,239
hunger Hape could even be used as a

109
00:04:19,490 --> 00:04:16,979
means to study other planets in our

110
00:04:21,469 --> 00:04:19,500
solar system specifically the world that

111
00:04:24,409 --> 00:04:21,479
volcanic islands play in water planets

112
00:04:26,330 --> 00:04:24,419
like Mars and Venus where you live on an

113
00:04:28,909 --> 00:04:26,340

ocean planet and so these kind of

114
00:04:31,909 --> 00:04:28,919
eruptions are part of our history how we

115
00:04:33,530 --> 00:04:31,919
got here as we evolved ourselves in the

116
00:04:35,570 --> 00:04:33,540
context of our planet and we want to

117
00:04:37,610 --> 00:04:35,580
take the lessons that we learn as we go

118
00:04:40,249 --> 00:04:37,620
forward as we continue to watch what's

119
00:04:42,350 --> 00:04:40,259
next in this exciting volcano and apply

120
00:04:44,930 --> 00:04:42,360
it forward to other worlds like Mars and

121
00:04:48,409 --> 00:04:44,940
Venus that may have harbored surface

122
00:04:50,749 --> 00:04:48,419
waters as oceans or seas and understand

123
00:04:53,210 --> 00:04:50,759
them in the context of our Earth

124
00:04:55,610 --> 00:04:53,220
using geostationary satellites and

125
00:04:57,650 --> 00:04:55,620
observed data NASA's scientists hope to

126
00:04:59,810 --> 00:04:57,660
learn from The Continuous evolution of

127
00:05:02,870 --> 00:04:59,820
this special volcano the question is

128
00:05:05,450 --> 00:05:02,880
will those come again at algatanga and

129
00:05:07,790 --> 00:05:05,460
then explode again we don't know so we

130
00:05:10,969 --> 00:05:07,800
need to use what we saw from this

131
00:05:13,850 --> 00:05:10,979
eruption in 22. to train ourselves for

132
00:05:16,969 --> 00:05:13,860
what to be able to predict and so this

133
00:05:18,950 --> 00:05:16,979
is our chance to learn and then to apply

134
00:05:21,550 --> 00:05:18,960
it to the other ocean worlds nearby that