
EXPLORING
ENERGY

1
00:00:00,010 --> 00:00:04,060
Music.

2
00:00:12,200 --> 00:00:08,160
Music

3
00:00:12,220 --> 00:00:16,240
Rob: We have an energy question today. Can you tell us about the energy within a hurricane?

4
00:00:16,260 --> 00:00:20,340
Jeff: The energy in a hurricane comes from the ocean. Of all

5
00:00:20,360 --> 00:00:24,370
the places, who would think, but the really warm water in the ocean,

6
00:00:24,390 --> 00:00:28,400
that causes the water to evaporate. And when

7
00:00:28,420 --> 00:00:32,440
these molecules leave the surface of the water, they take some heat energy with them, and

8
00:00:32,460 --> 00:00:36,470
as that heat energy gets up into the hurricane, those water vapor

9
00:00:36,490 --> 00:00:40,530
molecules condense and they release their heat into the atmosphere.

10
00:00:40,550 --> 00:00:44,580
And that's how the hurricane gets its power. That warm air we see in the

11
00:00:44,600 --> 00:00:48,640
center of the storm--the eye--that comes from the ocean basically.

12
00:00:48,660 --> 00:00:52,720
Rob: Is there a name for that heat?
Jeff: That's called latent heat because

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00:00:52,740 --> 00:00:56,760
latent means it's kind of hidden. So you can't put a thermometer in it and measure it directly,

14
00:00:56,780 --> 00:01:00,760
but it's in those molecules. They're like little mobile solar collectors.

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00:01:00,780 --> 00:01:03,810
Rob: And what happens to the energy after the hurricane is dissipating?

16
00:01:03,830 --> 00:01:07,880
Jeff: So the top of the hurricane behaves like a giant radiator in

17
00:01:07,900 --> 00:01:11,930
an engine. It's warmer than its surroundings because of all that heat

18
00:01:11,950 --> 00:01:15,970
and it just radiates it out to space.
Narrator: Researchers from

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00:01:15,990 --> 00:01:20,010
NASA and the National Oceanic and Atmospheric Administration work from both

20
00:01:20,030 --> 00:01:24,030
in the air and on the ground, investigating the energy needed to form hurricanes,

21
00:01:24,050 --> 00:01:28,040
as well as the energy hurricanes release. Looking at these factors

22
00:01:28,060 --> 00:01:32,060
may help scientists better predict the strength and paths of the storms

23
00:01:32,080 --> 00:01:36,110
ensuring the safety of people everywhere. While NASA and NOAA work all around the

24
00:01:36,130 --> 00:01:40,200
globe studying hurricanes, here's a classroom activity that lets us look at

25
00:01:40,220 --> 00:01:44,230

real hurricanes and make some observations of our own.

26
00:01:44,250 --> 00:01:48,270
This activity from My NASA Data allows students to examine sea surface

27
00:01:48,290 --> 00:01:52,290
temperature to explore how hurricanes extract heat energy from the ocean's

28
00:01:52,310 --> 00:01:56,300
surface. In this exercise, we have access to data

29
00:01:56,320 --> 00:02:00,330
and images that researchers and satellites have gathered on Hurricane Rita,

30
00:02:00,350 --> 00:02:04,340
a Category 5 hurricane that tore through the Gulf of Mexico in September 2005.

31
00:02:04,360 --> 00:02:08,360
If we want to look at energy on a large scale, this is a

32
00:02:08,380 --> 00:02:12,400
good place to start. Here, we're looking at the period during

33
00:02:12,420 --> 00:02:16,450
and right after Hurricane Rita, using data from the GOES and Aqua satellites

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00:02:16,470 --> 00:02:20,490
which provide information on clouds and infrared energy from the ocean's

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00:02:20,510 --> 00:02:24,510
surface. We'll be creating a time series of images of the Gulf

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00:02:24,530 --> 00:02:28,530
of Mexico in order to investigate sea surface temperature changes in the wake

37
00:02:28,550 --> 00:02:32,550
of a hurricane. Hurricanes cause a large transfer of heat between

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00:02:32,570 --> 00:02:36,570
the ocean's surface and the atmosphere. They also cause upwelling,

39
00:02:36,590 --> 00:02:40,600
which is ocean circulation that brings cold, deep water to the surface.