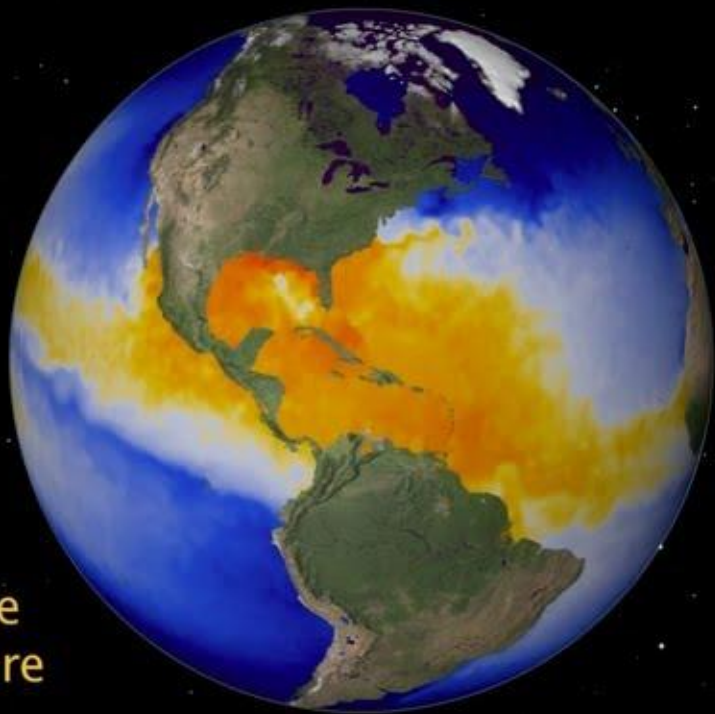


AMSR-E
sea surface
temperature



1
00:00:08,390 --> 00:00:12,560
NASA satellites

2
00:00:12,580 --> 00:00:16,740
constantly circle the globe, using a range of ingenious instruments to monitor the

3
00:00:16,760 --> 00:00:20,910
weather, climate, and biosphere. But just like our eyes,

4
00:00:20,930 --> 00:00:25,050
there's one thing many of them can't do - see through clouds.

5
00:00:25,070 --> 00:00:29,150
Luckily there are a few instruments that are here to help.

6
00:00:29,170 --> 00:00:33,280
The AMSR-E instrument is a microwave radiometer

7
00:00:33,300 --> 00:00:37,420
That's sort of like a radar in reverse. It has a big dish,

8
00:00:37,440 --> 00:00:41,530
kind of like one of those TV dishes that you see out in people's

9
00:00:41,550 --> 00:00:45,610
yards. It sits up on the Aqua satellite kind of like a hood ornament

10
00:00:45,630 --> 00:00:49,680
and it measures all kinds of important things that we need to know to understand

11
00:00:49,700 --> 00:00:53,730
the water cycle. You know, where the water goes, from

12
00:00:53,750 --> 00:00:57,740
evaporation in the ocean to rainfall

13
00:00:57,760 --> 00:01:01,920

over ocean and land, and sea ice, and snow cover and all of the

14

00:01:01,940 --> 00:01:06,100

different things that we can measure with this instrument and

15

00:01:06,120 --> 00:01:10,290

they're important to understand the Earth's system, the climate system to see how

16

00:01:10,310 --> 00:01:14,460

everything interacts with everything else.

17

00:01:14,480 --> 00:01:18,640

One of the things that we can measure with AMSR-E is sea ice cover.

18

00:01:18,660 --> 00:01:22,810

In the Arctic and around the Antarctic. And one of the cool things you can do

19

00:01:22,830 --> 00:01:26,960

with this imagery that we have in the microwave - and we're looking through clouds -

20

00:01:26,980 --> 00:01:31,110

at the sea ice - is, since we cover the Arctic and Antarctic every day,

21

00:01:31,130 --> 00:01:35,260

day after day after day after day, and sea ice changes kind of slowly

22

00:01:35,280 --> 00:01:39,400

as it melts or as it freezes and as the wind pushes it around,

23

00:01:39,420 --> 00:01:43,540

you can make an animation of this which ends up showing you very nicely

24

00:01:43,560 --> 00:01:47,640

how sea ice evolves during, let's say, the freeze portion

25

00:01:47,660 --> 00:01:51,720

of the winter. Or during the summer melt season. And how the ice

26

00:01:51,740 --> 00:01:55,780

flows as the wind pushes it down past Greenland in between Greenland and

27

00:01:55,800 --> 00:01:59,800

Canada. It shows us dynamically what's happening.

28

00:01:59,820 --> 00:02:03,990

And what's really cool is that with an instrument like AMSR-E, you can see

29

00:02:04,010 --> 00:02:08,170

all this even if there are clouds in the way.

30

00:02:08,190 --> 00:02:12,390

Sunlight issue becomes big because

31

00:02:12,410 --> 00:02:16,510

in the wintertime, there are months without sunlight.

32

00:02:16,530 --> 00:02:20,640

So for all those months where a visible satellite instrument

33

00:02:20,660 --> 00:02:24,830

would not allow you to get information because you didn't

34

00:02:24,850 --> 00:02:29,010

have sunlight, the AMSR-E microwave instrument

35

00:02:29,030 --> 00:02:33,210

will allow you to get the information, so with the AMSR we can get information

36

00:02:33,230 --> 00:02:37,360

daytime or nighttime or cloudy or not cloudy

37

00:02:37,380 --> 00:02:41,480

about the Earth surface.

38

00:02:41,500 --> 00:02:45,590

One of the products from AMSR-E that's being used more and more

39

00:02:45,610 --> 00:02:49,740

is sea surface temperatures that we can measure right through clouds because

40

00:02:49,760 --> 00:02:53,820

the hurricane centers around the world, using sea surface temperatures from

41

00:02:53,840 --> 00:02:57,890

AMSR-E to see how warm the water is out ahead of the hurricane, but then also

42

00:02:57,910 --> 00:03:01,940

as the hurricane goes by it leaves behind a cold wake of water.

43

00:03:01,960 --> 00:03:05,980

Which if there's a hurricane that's coming behind it, that will tend to kill the

44

00:03:06,000 --> 00:03:10,150

hurricane coming behind it. And the hurricane forecasters are excited about

45

00:03:10,170 --> 00:03:14,330

the information they have that they didn't have before.

46

00:03:14,350 --> 00:03:18,510

AMSR-E data also help us understand our changing climate.

47

00:03:18,530 --> 00:03:22,710

AMSR's contribution to the science of climate change

48

00:03:22,730 --> 00:03:26,890

has been, for example, a long term record

49

00:03:26,910 --> 00:03:31,060

of global sea surface temperatures in all weather conditions through

50

00:03:31,080 --> 00:03:35,250

clouds, so we have this very important long-term data set

51

00:03:35,270 --> 00:03:39,410

showing how much is the Earth warming? What happens with the Earth

52

00:03:39,430 --> 00:03:43,560

cools during a La Niña event? We can ask the question, what caused

53

00:03:43,580 --> 00:03:47,680

the cooling, how did the cooling affect cloudiness? These are things that we can