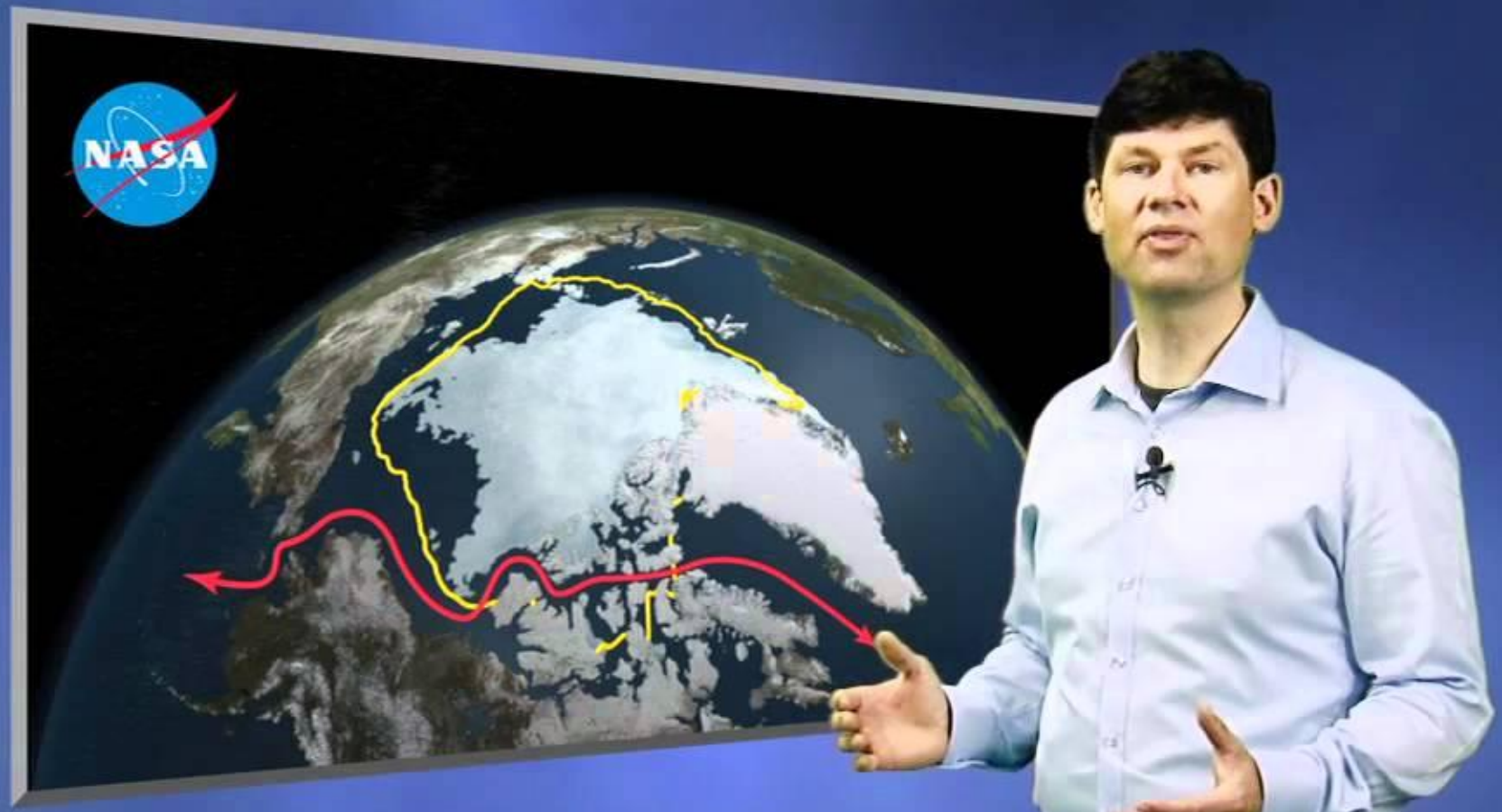
NASA

1
00:00:00,010 --> 00:00:04,090
Dr. Wagner, can you tell us exactly what sea ice is

2
00:00:04,110 --> 00:00:08,170
and what's new about it this year?

3
00:00:08,190 --> 00:00:12,250
Sea ice forms on the ocean in the winter months, and the image you're looking at right here

4
00:00:12,270 --> 00:00:16,320
is a picture of the top of the planet -- not a model, not a simulation, not an artist's impression

5
00:00:16,340 --> 00:00:20,370
but this is actual data from a satellite showing us the sea ice cover

6
00:00:20,390 --> 00:00:24,410
on the Arctic Ocean. And what's really important to us is we're trying to understand

7
00:00:24,430 --> 00:00:28,450
how that sea ice changes over the course of the year and how much it melts back

8
00:00:28,470 --> 00:00:32,480
and what we're looking at is just changes over the last six months here.

9
00:00:32,500 --> 00:00:36,490
Well, can you tell us why sea ice is important?

10
00:00:36,510 --> 00:00:40,590
The reason that sea ice is important is that it's kind of one of the main controls on weather over the

11
00:00:40,610 --> 00:00:44,670
whole planet. The Arctic Ocean actually functions as kind of like a mirror

12
00:00:44,690 --> 00:00:48,750
or hat up on the surface of the Earth, and as that ice begins to decrease

13
00:00:48,770 --> 00:00:52,830

and melt away, that sunlight encounters dark ocean where it gets absorbed and begins

14
00:00:52,850 --> 00:00:56,890
to heat the ocean up. And what happens is that normally Pacific and Atlantic water

15
00:00:56,910 --> 00:01:00,950
goes into the Arctic, gets cooled off, and becomes denser and sinks and flows out

16
00:01:00,970 --> 00:01:04,990
as ocean circulation. And ocean circulation is what sets the weather and the climate

17
00:01:05,010 --> 00:01:09,020
for the entire planet. So as we change the Arctic Ocean we change that.

18
00:01:09,040 --> 00:01:13,050
But we also change the Arctic itself quite a bit. You've probably heard about some of the polar bears

19
00:01:13,070 --> 00:01:17,070
that as the ice decreases, they're getting taken further away from their food.

20
00:01:17,090 --> 00:01:21,160
But also too as that ice changes we do things like open up the Northwest Passage shown here in red.

21
00:01:21,180 --> 00:01:25,240
And what we're really concerned about is that over the last 30 years

22
00:01:25,260 --> 00:01:29,330
which is this yellow line here, that's what the average ice extent

23
00:01:29,350 --> 00:01:33,400
has been at this kind of minimum period after the summer melt in September.

24
00:01:33,420 --> 00:01:37,460
And as you can see there's a lot more blue in there -- that's a lot more open water.

25
00:01:37,480 --> 00:01:41,570
And what we're trying to understand is how those changes are correlated with warming

26
00:01:41,590 --> 00:01:45,620
of the planet overall.

27
00:01:45,640 --> 00:01:49,650
Have you identified what's causing more sea ice to melt?

28
00:01:49,670 --> 00:01:53,680
We think that it's likely associated with warming of the planet. And the reason for that is if you look at how

29
00:01:53,700 --> 00:01:57,700
the planet warms, what's happened is that even just over the last couple of decades,

30
00:01:57,720 --> 00:02:01,810
you can see that the temperate zones warm up but the poles warm up

31
00:02:01,830 --> 00:02:05,900
faster than the whole rest of the planet. And it looks like the Arctic just in the last decade

32
00:02:05,920 --> 00:02:10,000
has probably warmed by about one to four degrees.

33
00:02:10,020 --> 00:02:14,140
What is NASA doing in particular to better understand the polar changes and their impacts?

34
00:02:14,160 --> 00:02:18,200
NASA does three things to really understand the polar regions.

35
00:02:18,220 --> 00:02:22,260
The first one is we send people out. They go out there and they stand on the ice

36
00:02:22,280 --> 00:02:26,320
and make measurements and they try to understand how it's changing.

37
00:02:26,340 --> 00:02:30,370
We also use a whole range of aircraft to understand the ice. We've got everything from

38
00:02:30,390 --> 00:02:34,410

old spy planes to even things like a DC-8, which you may have flown on,

39
00:02:34,430 --> 00:02:38,440
which have all these special holes cut in them and this unbelievable array of instruments,

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00:02:38,460 --> 00:02:42,450
instruments that can measure the surface of the ice. We also have things like radars that can penetrate

41
00:02:42,470 --> 00:02:46,540
the ice and map the bed underneath it. But probably the most important and unique thing we do is

42
00:02:46,560 --> 00:02:50,640
study the ice with satellites. And we need to use satellites because these polar

43
00:02:50,660 --> 00:02:54,720
icesheets are so vast, you need a satellite to get the coverage.

44
00:02:54,740 --> 00:02:58,780
And next month, we're going to launch the next polar-orbiting weather satellite, NPP.

45
00:02:58,800 --> 00:03:02,870
What is causing our other recent dramatic events,

46
00:03:02,890 --> 00:03:06,920
hurricanes, tornadoes, earthquakes, floods -- is that related?

47
00:03:06,940 --> 00:03:10,960
It seems like there's been a lot of changes happening on the planet with all these

48
00:03:10,980 --> 00:03:15,000
natural disasters and things. In terms of like earthquakes and volcanoes,

49
00:03:15,020 --> 00:03:19,020
there's no evidence that there's any more of those now then there have ever been, but there's more people no

50
00:03:19,040 --> 00:03:23,040
We live in more hazardous areas along coasts and fertile valleys around volcanoes and things.

51
00:03:23,060 --> 00:03:27,140
But the changes that are happening with weather, we're still trying to

52
00:03:27,160 --> 00:03:31,230
work those out. In general though the changes we're seeing are

53
00:03:31,250 --> 00:03:35,330
probably consistent with a warming planet, but that's kind of the edge of the research that we're working on.