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1
00:00:00,160 --> 00:00:04,190
[chimes]

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00:00:04,210 --> 00:00:08,190
Q: We have with us

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00:00:08,210 --> 00:00:12,240
Dr. Carlos del Castillo, who will discuss what is happening in the Arctic this summer.

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00:00:12,260 --> 00:00:16,400
Thanks for coming to the program.A: Thank you for the invitation.

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00:00:16,420 --> 00:00:20,600
Q: Last year was a record year for sea ice loss in the Arctic.

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00:00:20,620 --> 00:00:24,640
What will happen this year?

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00:00:24,660 --> 00:00:28,660
A: This year, fortunately, the amount of ice that we've lost so far will not compare with

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00:00:28,680 --> 00:00:32,820
what was lost last year, but that does not mean that the Arctic is recovering.

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00:00:32,840 --> 00:00:36,850
Compared to the average, in the last 10

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00:00:36,870 --> 00:00:40,890
years we have lost a chunk of ice equivalent to

11
00:00:40,910 --> 00:00:44,930
1.5 times the area of Texas.

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00:00:44,950 --> 00:00:49,010
Besides the loss we are seeing in the ice that is on the ocean,

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00:00:49,030 --> 00:00:53,110

we are also losing large amounts of ice in Greenland and

14
00:00:53,130 --> 00:00:57,270
in the permafrost regions.

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00:00:57,290 --> 00:01:01,280
Q: So the long-term trend is a continued decline?

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00:01:01,300 --> 00:01:05,370
A: Yes, the long-term trend is a decrease in the ice cover of the Arctic.

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00:01:05,390 --> 00:01:09,560
The satellite data shows that the ice has been

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00:01:09,580 --> 00:01:13,740
declining consistently year after year.

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00:01:13,760 --> 00:01:17,940
Clearly, there are fluctuations: some years there is more ice than other years,

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00:01:17,960 --> 00:01:22,040
but the trend we see in our satellite and field measurements

21
00:01:22,060 --> 00:01:26,100
is unfortunately a steady decline.

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00:01:26,120 --> 00:01:30,130
Q: But the Arctic is far away. How does the melting of sea ice affect us in the United States?

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00:01:30,150 --> 00:01:34,180
A: Excellent question. The polar

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00:01:34,200 --> 00:01:38,200
The polar ice caps function as the air conditioner of the planet.

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00:01:38,220 --> 00:01:42,330
Heated air is generated in the tropics and

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00:01:42,350 --> 00:01:46,350
is cooled at the poles. When we lose this ability

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00:01:46,370 --> 00:01:50,370
to cool air in the polar areas, in this case in the Arctic,

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00:01:50,390 --> 00:01:54,400
we can experience variations in the location of the jet stream.

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00:01:54,420 --> 00:01:58,470
This can result in flow patterns

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00:01:58,490 --> 00:02:02,730
of air masses that can for example block

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00:02:02,750 --> 00:02:06,900
the movement of hot air and result in

32
00:02:06,920 --> 00:02:10,920
a heat wave, or result in ice storms, snow storms

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00:02:10,940 --> 00:02:14,960
In general, what we would experience would be extreme

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00:02:14,980 --> 00:02:19,000
weather conditions. Weather conditions that are new to us.

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00:02:19,020 --> 00:02:23,170
Q: Sea ice does not affect

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00:02:23,190 --> 00:02:28,370
sea level rise, but land ice does.

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00:02:28,390 --> 00:02:32,490
Could you explain what is happening in Greenland?

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00:02:32,510 --> 00:02:36,730

A: Yes, that’s correct. The ice covers the ocean, as in the case of the Arctic, when it melts, it does not change

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00:02:36,750 --> 00:02:40,790
sea level. But the ice is in Greenland, which is extremely

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00:02:40,810 --> 00:02:44,860
thick, is starting to melt at an accelerated pace.

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00:02:44,880 --> 00:02:48,920
For example, last year we had an large surface melting event

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00:02:48,940 --> 00:02:52,930
and even in the coldest regions in the north of Greenland,

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00:02:52,950 --> 00:02:57,160
we are experiencing an increase in the speed of movement

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00:02:57,180 --> 00:03:01,340
of the ice that goes from land to ocean,

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00:03:01,360 --> 00:03:05,380
which will obviously increase the volume [of the ocean] and will increase sea level.

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00:03:05,400 --> 00:03:09,610
Q: But meanwhile, in the opposite pole of Earth,

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00:03:09,630 --> 00:03:13,660
we are seeing an increase in the extent of sea ice in Antarctica. Can you explain why

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00:03:13,680 --> 00:03:17,730
this is happening, does is have anything to do with global warming?

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00:03:17,750 --> 00:03:21,750
A: Yes, absolutely. First of all, the

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00:03:21,770 --> 00:03:25,940
Arctic and Antarctica are very different. The Arctic is an ocean surrounded

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00:03:25,960 --> 00:03:30,040
by continents, and ice is floating in the water. In the case of

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00:03:30,060 --> 00:03:34,250
Antarctica, it is a huge continent with ice on land,

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00:03:34,270 --> 00:03:38,280
and the ocean is surrounding the land.

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00:03:38,300 --> 00:03:42,320
In Antarctica, we have seen a small increase

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00:03:42,340 --> 00:03:46,330
in the amount of the sea ice surrounding the continent, but

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00:03:46,350 --> 00:03:50,540
we have observed substantial decreases in the amount

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00:03:50,560 --> 00:03:54,540
of ice that is on the continent, particularly in the west.

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00:03:54,560 --> 00:03:58,600
In the eastern part of the continent, ices has somewhat

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00:03:58,620 --> 00:04:02,680
increased, but in the west it has declined further, particularly in the Antarctic Peninsula,

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00:04:02,700 --> 00:04:06,690
and we are experiencing a net loss of ice.

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00:04:06,710 --> 00:04:10,880
Q: Usually when people think of NASA, they think of space exploration, but NASA is also looking

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00:04:10,900 --> 00:04:14,880
at what is happening on the planet. Could you explain what NASA does to better understand

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00:04:14,900 --> 00:04:19,070

what is happening in the Arctic?

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00:04:19,090 --> 00:04:23,160
A: Absolutely. Space is one of the best places to study planet Earth, because we're seeing

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00:04:23,180 --> 00:04:27,250
it from the perspective of being off the planet. NASA has a fleet of over

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00:04:27,270 --> 00:04:31,250
20 satellites that are devoted to study different aspects

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00:04:31,270 --> 00:04:35,360
of the planet: the atmosphere, ocean, land...

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00:04:35,380 --> 00:04:39,410
And sometimes all together. We also have expeditions

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00:04:39,430 --> 00:04:43,460
in which we use aircraft that carry fantastic tools: combinations of laser

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00:04:43,480 --> 00:04:47,540
and radar that can measure not only the thickness of the ice,

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00:04:47,560 --> 00:04:51,620
but even the thickness of the snow on top

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00:04:51,640 --> 00:04:55,820
of the ice. And this allows us to not only determine the area

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00:04:55,840 --> 00:04:59,830
that the ice is covering, but also the thickness [of the ice], which is very important

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00:04:59,850 --> 00:05:03,870
in order to determine the changes in this region of the planet.

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00:05:03,890 --> 00:05:07,870
Q: Thanks for the explanations, this is all fascinating.

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00:05:07,890 --> 00:05:11,920
Could you tell our viewers where they can go to learn more about these topics?

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00:05:11,940 --> 00:05:16,100
A: Absolutely. They can

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00:05:16,120 --> 00:05:20,230
visit nasa.gov / Earth

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00:05:20,250 --> 00:05:24,350
We also have a Twitter page in Spanish that can be found at