Moon landing!

1960

1965

1970

1
00:00:08,100 --> 00:00:04,050
[music]

2
00:00:08,120 --> 00:00:12,120
Narrator: After centuries of exploring the Arctic from the ground, sea

3
00:00:12,140 --> 00:00:16,210
and then by air, a revolution was about to take place.

4
00:00:16,230 --> 00:00:20,240
thanks to our new view from orbit. [rocket launching]

5
00:00:20,260 --> 00:00:24,250
With the space age in full bloom, the first satellites to take regular images

6
00:00:24,270 --> 00:00:28,300
of Arctic sea ice were TIROS weather satellites

7
00:00:28,320 --> 00:00:32,370
Archival narrator: ... collection of instruments ever assembled to study the use of space vehicles

8
00:00:32,390 --> 00:00:36,430
for comprehensive weather observation. The most important of these being

9
00:00:36,450 --> 00:00:40,440
two videcon cameras. Both record on this

10
00:00:40,460 --> 00:00:44,530
magnetic tape machine, and on command, send their scannings back to Earth.

11
00:00:44,550 --> 00:00:48,530
Narrator: But the TIROS instruments could not see through clouds

12
00:00:48,550 --> 00:00:52,700
or during the long polar night of winter.

13
00:00:52,720 --> 00:00:56,790

Starting in 1967 NASA began testing more advanced satellite instruments

14
00:00:56,810 --> 00:01:00,830
n board research aircraft over the Arctic. In 1972, a new

15
00:01:00,850 --> 00:01:05,010
satellite called Nimbus 5 and its ESMR instrument began four years of

16
00:01:05,030 --> 00:01:09,180
all-weather, all season imagery of sea ice,

17
00:01:09,200 --> 00:01:13,250
and in 1978, Nimbus 7 used its more advanced microwave

18
00:01:13,270 --> 00:01:17,420
instrument, which could for the first time help distinguish young ice from old.

19
00:01:17,440 --> 00:01:21,600
In 1983 The first Atlas of

20
00:01:21,620 --> 00:01:25,790
Antarctic sea ice was published by NASA Goddard researchers,

21
00:01:25,810 --> 00:01:29,830
followed by an Arctic Atlas four years later. Both were used by

22
00:01:29,850 --> 00:01:34,010
scientists and mariners around the globe. In the first few years

23
00:01:34,030 --> 00:01:38,110
of continuous data collection, researchers started to see a slight decline

24
00:01:38,130 --> 00:01:42,170
in the ice, but they reported the decrease was still within the realm of yearly variability,

25
00:01:42,190 --> 00:01:46,210
and not strong enough to tie decisively to a changing climate.

26
00:01:46,230 --> 00:01:50,300
But in 1999, the trend was becoming clear.

27
00:01:50,320 --> 00:01:54,330
The Arctic was losing ice cover at almost 3 percent per decade.

28
00:01:54,350 --> 00:01:58,400
In 2002, NASA launched the Aqua satellite

29
00:01:58,420 --> 00:02:02,600
with Japan's AMSR-E instrument, which provided even more enhanced

30
00:02:02,620 --> 00:02:06,810
observations of ice extent, and in 2003, NASA

31
00:02:06,830 --> 00:02:10,970
launched ICESat, which had a laser altimeter on board that provided data

32
00:02:10,990 --> 00:02:15,070
for producing maps of ice thickness.

33
00:02:15,090 --> 00:02:19,100
New record summer minimums were reached in '99, 2002, and 2005,

34
00:02:19,120 --> 00:02:23,280
but in 2007, a shockingly large decline

35
00:02:23,300 --> 00:02:27,410
stunned the research community, and scientists realized they needed to get a

36
00:02:27,430 --> 00:02:31,470
better handle on not just the surface area of the ice pack, but the thickness as well.

37
00:02:31,490 --> 00:02:35,520
[aircraft noise] New missions started to focus on

38
00:02:35,540 --> 00:02:39,530

sea ice thickness data, including an ongoing NASA airborne campaign

39
00:02:39,550 --> 00:02:43,570
called Operation IceBridge, and the European Space Agency’s Cryosat-2 satellite.

40
00:02:43,590 --> 00:02:47,720
In summer 2012, due in part

41
00:02:47,740 --> 00:02:51,740
to even thinner ice and a strong Arctic cyclone, yet another

42
00:02:51,760 --> 00:02:55,920
minimum was reached. The last few years haven’t set any new records,

43
00:02:55,940 --> 00:03:00,050
but ice extent and volume continue to be well below the levels

44
00:03:00,070 --> 00:03:04,110
scientists first saw when the satellite era began.

45
00:03:04,130 --> 00:03:08,260
Computer models predict Arctic sea ice will continue to shrink in coming years.

46
00:03:08,280 --> 00:03:12,300
With new satellite missions, instruments in the air, and boots on the ground,

47
00:03:12,320 --> 00:03:16,460
researchers will continue to study not only ice cover and thickness

48
00:03:16,480 --> 00:03:20,560
but also how the loss of ice will affect both the Arctic,