
EARTH SYSTEM
OBSERVATORY

1
00:00:02,635 --> 00:00:04,371
As NASA prepares to send

2
00:00:04,371 --> 00:00:06,139
humans to the Moon and Mars ...

3
00:00:06,840 --> 00:00:09,743
and peer even deeper into the universe,

4
00:00:09,743 --> 00:00:12,412
we turn with a renewed focus

5
00:00:12,412 --> 00:00:14,381
to our home planet of Earth.

6
00:00:18,518 --> 00:00:20,887
The next generation of Earth science

7
00:00:20,887 --> 00:00:24,324
begins with the new Earth System Observatory.

8
00:00:24,357 --> 00:00:26,159
The core of the observatory

9
00:00:26,192 --> 00:00:28,762
is an array of five new satellite missions

10
00:00:28,795 --> 00:00:31,297
that will study the atmosphere, the ground

11
00:00:31,297 --> 00:00:34,067
and even what's happening underneath the surface.

12
00:00:34,100 --> 00:00:37,003
These spacecraft will look at the Earth.

13
00:00:37,037 --> 00:00:39,172

Each one of them their own way and will

14
00:00:39,172 --> 00:00:41,941
integrate all the data and a common approach.

15
00:00:42,042 --> 00:00:45,378
Taken together as a single observatory,

16
00:00:45,578 --> 00:00:48,415
we will have a complete 3-dimensional

17
00:00:48,448 --> 00:00:50,717
understanding our earth's systems –

18
00:00:50,717 --> 00:00:52,252
how they work together …

19
00:00:52,252 --> 00:00:54,788
how one change can influence another.

20
00:00:56,756 --> 00:00:59,092
It will watch our planet change

21
00:00:59,092 --> 00:01:01,561
driving solutions for better living,

22
00:01:01,761 --> 00:01:04,531
managing water and food resources,

23
00:01:04,531 --> 00:01:06,633
predicting natural hazards,

24
00:01:06,733 --> 00:01:10,236
coping with sea level rise in coastal communities

25
00:01:10,370 --> 00:01:12,772
and heat islands in our cities.

26
00:01:15,642 --> 00:01:19,646
Every 10 years, the best scientists in the United States

27
00:01:19,646 --> 00:01:21,881
and worldwide come together and create a strategy

28
00:01:21,881 --> 00:01:23,183
that the decadal strategy

29
00:01:23,383 --> 00:01:26,553
and it recommended that we build missions

30
00:01:26,586 --> 00:01:29,122
that together form an Earth System Observatory.

31
00:01:29,222 --> 00:01:31,825
We're going to be looking at process

32
00:01:31,825 --> 00:01:34,160
at the microphysical scale,

33
00:01:34,194 --> 00:01:37,130
at the large kind of convective scale,

34
00:01:37,163 --> 00:01:39,365
at the smaller scale in the oceans,

35
00:01:39,399 --> 00:01:41,301
and we're going to be investigating those,

36
00:01:41,301 --> 00:01:43,903
pulling that out, encapsulating that

37
00:01:43,970 --> 00:01:45,505
putting that into weather

38
00:01:45,505 --> 00:01:46,773

models and climate models

39
00:01:46,773 --> 00:01:47,440
and those are going

40
00:01:47,440 --> 00:01:50,510
to allow us to predict and project

41
00:01:50,543 --> 00:01:52,979
the future with far more confidence.

42
00:01:53,780 --> 00:01:56,983
We can from space help farmers.

43
00:01:56,983 --> 00:01:58,518
We can help others

44
00:01:58,518 --> 00:02:00,553
that grow food around the earth.

45
00:02:00,587 --> 00:02:01,955
If there is an earthquake,

46
00:02:01,955 --> 00:02:04,691
we can get our models better

47
00:02:04,691 --> 00:02:06,860
and from there we can predict

48
00:02:06,860 --> 00:02:08,394
better also in the future.

49
00:02:08,428 --> 00:02:10,163
We can monitor freshwater

50
00:02:10,163 --> 00:02:12,432
both on the surface and underground

51
00:02:12,465 --> 00:02:13,900
to help water managers

52
00:02:13,967 --> 00:02:16,202
both for communities as well as agriculture.

53
00:02:19,038 --> 00:02:20,673
To build the observatory,

54
00:02:20,707 --> 00:02:22,942
we will expand our partnerships

55
00:02:22,942 --> 00:02:24,310
with commercial companies

56
00:02:24,310 --> 00:02:26,613
and international space agencies

57
00:02:26,779 --> 00:02:28,915
to take advantage of innovation

58
00:02:28,948 --> 00:02:30,183
and new technology.

59
00:02:30,216 --> 00:02:32,252
We recognize because of the global

60
00:02:32,252 --> 00:02:34,087
nature of the issues at hand,

61
00:02:34,320 --> 00:02:36,022
we want international partners

62
00:02:36,022 --> 00:02:37,590
to be part of that also.

63
00:02:37,891 --> 00:02:39,292

We are working together

64
00:02:39,325 --> 00:02:41,327
and the science that we're doing

65
00:02:41,427 --> 00:02:43,563
has to serve all of us.

66
00:02:44,697 --> 00:02:47,800
NISAR is our first major partnership

67
00:02:47,800 --> 00:02:50,370
with the Indian Space Agency in Earth science.

68
00:02:50,470 --> 00:02:55,308
It brings together two different kinds of radar systems

69
00:02:55,575 --> 00:02:57,744
that together will see

70
00:02:57,810 --> 00:02:59,913
changes in our Earth's surface

71
00:02:59,946 --> 00:03:01,181
that will help us predict

72
00:03:01,181 --> 00:03:02,549
natural hazards in. the future.

73
00:03:02,549 --> 00:03:03,950
The NISAR mission will

74
00:03:03,950 --> 00:03:06,019
measure changes in Earth's surface

75
00:03:06,052 --> 00:03:08,321
less than a centimeter across.

76
00:03:08,721 --> 00:03:10,023
It will measure the movement

77
00:03:10,023 --> 00:03:11,858
of glaciers and ice sheets ...

78
00:03:11,858 --> 00:03:13,626
the dynamics of earthquakes

79
00:03:13,660 --> 00:03:14,627
and volcanoes ...

80
00:03:14,627 --> 00:03:16,663
and changes in farmland.

81
00:03:16,696 --> 00:03:19,532
We will observe the earth

82
00:03:19,566 --> 00:03:21,167
every 12 days exactly

83
00:03:21,167 --> 00:03:23,736
at the righ repeat pass orbit.

84
00:03:23,770 --> 00:03:26,573
We can study small changes

85
00:03:26,606 --> 00:03:28,841
in the Earth system sciences.

86
00:03:31,911 --> 00:03:33,713
The Earth's climate is changing.

87
00:03:33,746 --> 00:03:35,782
We have documented the changes

88
00:03:35,782 --> 00:03:38,918

that we're seeing over the last few decades.

89
00:03:38,952 --> 00:03:40,753
We know that it's being driven

90
00:03:40,787 --> 00:03:42,255
by human activities

91
00:03:42,355 --> 00:03:44,891
and it's absolutely essential

92
00:03:44,924 --> 00:03:47,093
that we continue to understand

93
00:03:47,126 --> 00:03:49,062
what's happening, what's changing

94
00:03:49,229 --> 00:03:50,897
in order to better predict

95
00:03:50,897 --> 00:03:53,066
what's going to happen, and perhaps

96
00:03:53,099 --> 00:03:55,001
help people make better choices.

97
00:03:55,101 --> 00:03:58,371
Understanding how our planet and its climate are changing

98
00:03:58,404 --> 00:04:01,407
is the foundation. for a more resilient

99
00:04:01,441 --> 00:04:03,109
and sustainable future.

100
00:04:03,109 --> 00:04:05,612
NASA's Earth System Observatory

101
00:04:05,712 --> 00:04:08,781
is the next step in this ongoing mission.