



1  
00:00:01,770 --> 00:00:07,660

\h Narrator: The Ocean Surface Topography Mission aboard the Jason-2 spacecraft is poised to take

2  
00:00:07,660 --> 00:00:12,830

\h its place in space to find out more about Earth and its oceans.

3  
00:00:12,830 --> 00:00:20,060

\h The OSTM/Jason-2 flight comes about 16 years after the first satellite was launched to measure the hei

4  
00:00:20,060 --> 00:00:26,510

\h of the world's seas in detail and show us how climate changes are impacting every continent.

5  
00:00:26,510 --> 00:00:33,000

\h That first satellite, called Topex/Poseidon, measured sea surface height down to about 1.5 inches and

6  
00:00:33,000 --> 00:00:40,050

\h provided the first database of global oceanographic information for this measurement. OSTM/Jason-2

7  
00:00:40,050 --> 00:00:48,000

\h will allow scientists to monitor ocean coastal regions with increased accuracy, nearly 50 percent closer t

8  
00:00:48,000 --> 00:00:54,750

\h Join NASA now for a look at this mission and what it means to life on Earth.

9  
00:00:54,750 --> 00:00:59,850

\h Tiffany Nail/NASA LSP: Hi, I'm Tiffany Nail of NASA's Launch Services Program. We're about to take

10  
00:00:59,850 --> 00:01:06,090

\h a closer look at the Ocean Surface Topography Mission on the Jason-2 spacecraft.

11  
00:01:06,090 --> 00:01:14,100

\h It's easy to think of the world's oceans as flat, blue expanses of water with waves relatively equal in sha

12  
00:01:14,100 --> 00:01:21,090

\h But NASA and the French Space Agency, CNES, have been working together since the 1990s to show

13  
00:01:21,090 --> 00:01:27,660

\h Earth's largest bodies of water actually have a very dynamic topography of hills and valleys.

14

00:01:27,660 --> 00:01:32,550

\h These hills and valleys give scientists information on the heat stored in the ocean

15

00:01:32,550 --> 00:01:37,930

\h and how ocean circulation influences earth's weather and climate.

16

00:01:37,930 --> 00:01:46,160

\h By better understanding the ocean, the minds behind OSTM/Jason-2 say we can all better understand t

17

00:01:46,160 --> 00:01:50,820

\h Narrator: The oceans are an indicator of changes to come in the planet's climate.

18

00:01:50,820 --> 00:01:55,900

\h By detecting minor changes in sea surface height now, scientists may be able to better

19

00:01:55,900 --> 00:01:59,380

\h forecast the strength and intensity of hurricanes.

20

00:01:59,380 --> 00:02:06,320

\h Researchers could forecast trouble for the world's fisheries in advance, possibly in time to prevent the p

21

00:02:06,320 --> 00:02:11,290

\h The OSTM/Jason-2 mission will take instruments into space that are similar to the

22

00:02:11,290 --> 00:02:15,280

\h ones launched on Topex/Poseidon and Jason-1.

23

00:02:15,280 --> 00:02:21,040

\h Those missions have already fueled studies on new theories about Earth's climate and weather patterns

24

00:02:21,040 --> 00:02:26,660

\h OSTM/Jason-2 will help create the first multi-decadal global record for

25

00:02:26,660 --> 00:02:30,850

\h understanding the vital roles of the ocean in climate change.

26

00:02:30,850 --> 00:02:35,450

\h Data from the new mission will allow us to continue monitoring global sea level change,

27

00:02:35,450 --> 00:02:41,930

\h one of the most important consequences and indicators of global climate change.

28

00:02:41,930 --> 00:02:45,160

\h Tiffany Nail/Launch Services Program, NASA: I'm here today with Armando Piloto, the LSP mission manager,

29

00:02:45,160 --> 00:02:50,030

\h for the launch of the OSTM/Jason-2 spacecraft. Armando, thanks for joining us.

30

00:02:50,030 --> 00:02:52,230

\h Armando Piloto/LSP Mission Manager: It's great to be here.

31

00:02:52,230 --> 00:02:53,500

\h Tiffany Nail/Launch Services Program, NASA: This mission is launching from the

32

00:02:53,500 --> 00:02:58,530

\h west coast of California. Why was that important for this flight?

33

00:02:58,530 --> 00:03:03,340

\h Armando Piloto/LSP Mission Manager: Launch from California is important for this flight because of the

34

00:03:03,340 --> 00:03:11,550

\h OSTM/Jason-2 orbital requirements. The spacecraft needs to be located at an orbit that is high in inclination

35

00:03:11,550 --> 00:03:16,960

\h The reason for that is because they want to be able to maximize their science and be

36

00:03:16,960 --> 00:03:20,260

\h able to map as much of the ocean as possible.

37

00:03:20,260 --> 00:03:29,700

\h So from a launch vehicle perspective, we can get them to this inclination more efficiently by being able to

38

00:03:29,700 --> 00:03:31,650

\h Tiffany Nail/Launch Services Program, NASA: We are a day away from launch. The

39

00:03:31,650 --> 00:03:39,790

\h OSTM/Jason-2 is inside the Delta II rocket out on Space Launch Complex 2. What work is left to be done

40

00:03:39,790 --> 00:03:44,880

\h Armando Piloto/LSP Mission Manager: Well Tiffany, as you can imagine a lot of work has been invested

41

00:03:44,880 --> 00:03:49,670

\h We're very excited but there are some very important activities coming up.

42

00:03:49,670 --> 00:03:56,480

\h From a spacecraft perspective they have to go in and finalize their inspection and final closeouts.

43

00:03:56,480 --> 00:04:04,970

\h They also have to continue charging the batteries, close to T-0. In addition to that, the launch vehicle team

44

00:04:04,970 --> 00:04:08,550

\h doing their final inspection of the entire vehicle to make sure all systems

45

00:04:08,550 --> 00:04:11,220

\h are ready to go. In addition to that,

46

00:04:11,220 --> 00:04:17,340

\h once that's completed, there will be some final connections made to the ordnance lines on the solid rocket

47

00:04:17,340 --> 00:04:24,700

\h Then the mobile service tower will be removed away from the launch vehicle. Once that's completed,

48

00:04:24,700 --> 00:04:31,320

\h then we will enter the final stages of the campaign. We will go into our terminal count.

49

00:04:31,320 --> 00:04:36,980

\h And during these final hours, there's a lot that's going on. We will be fueling the first stage.

50

00:04:36,980 --> 00:04:47,850

\h We would also be doing checks with the gimbling of the engines. There will also be several polls directing

51

00:04:47,850 --> 00:04:53,880

\h Toward the end, the spacecraft and both the launch vehicle, once everything's ready to go,

52

00:04:53,880 --> 00:05:00,740

\h they will go to internal power and hopefully tomorrow morning, early in the morning, we will be having a

53

00:05:00,740 --> 00:05:03,200

\h A successful launch of the OSTM/Jason-2 mission. Tiffany Nail/Launch Services Program, NASA:

54

00:05:03,200 --> 00:05:06,340

\h Thanks for coming by Armando, and good luck with the launch.

55

00:05:06,340 --> 00:05:08,480

\h Armando Piloto/LSP Mission Manager: Thank you, Tiffany.

56

00:05:08,480 --> 00:05:13,380

\h Tiffany Nail/Launch Services Program, NASA: Now that we've learned more about the remaining launch

57

00:05:13,380 --> 00:05:19,140

\h OSTM/Jason-2, let's find out more about the science of the mission from the project scientist. Take a lo

58

00:05:19,140 --> 00:05:21,680

\h Josh Willis/Oceanographer, Jet Propulsion Laboratory It's a very difficult technological challenge in orde

59

00:05:21,680 --> 00:05:27,550

\h measure sea surface height with the precision of about one inch, from 830 miles in space.

60

00:05:27,550 --> 00:05:33,200

\h This is accomplished in two ways. First you have to know the position of the satellite very accurately.

61

00:05:33,200 --> 00:05:39,400

\h So this is accomplished with a number of instruments, including a GPS receiver, sort of like the one in y

62

00:05:39,400 --> 00:05:45,910

\h but a little more sophisticated. Laser reflecting array and another system called DORIS (dual-frequency

63

00:05:45,910 --> 00:05:50,160

\h These essentially tell us where the satellite is. Now the radar altimeter tells us the distance

64

00:05:50,160 --> 00:05:53,620

\h between the satellite and the surface of the ocean,

65

00:05:53,620 --> 00:06:00,760

\h by basically just bouncing a radio wave off of it. So using these two pieces of information; the position of

66

00:06:00,760 --> 00:06:05,790

\h distance of the satellite from the ocean to itself, you can figure out the height of the ocean.

67

00:06:05,790 --> 00:06:13,400

\h That's what the satellite tells us. Scientists use these data to help understand the ocean and its role in the

68

00:06:13,400 --> 00:06:21,430

\h The ocean is sort of like the fly wheel of the climate system. It's big, it's slow moving and it helps move the

69

00:06:21,430 --> 00:06:27,120

\h So the oceans really are important to understanding climate and measuring sea level is a

70

00:06:27,120 --> 00:06:33,530

\h really important way of measuring the oceans and their role in the climate system.

71

00:06:33,530 --> 00:06:39,860

\h The oceans absorb 84 percent of the heat from global warming. Now, when they absorb this heat they expand

72

00:06:39,860 --> 00:06:46,730

\h just like a lot of other materials. Water, when it gets warm, it stands a little taller. This is part of the signal

73

00:06:46,730 --> 00:06:55,530

\h So satellites like OSTM, Jason and Topex before it really help us measure the total amount of heat that's

74

00:06:55,530 --> 00:07:00,810

\h That's a big chunk of the heat that goes into the climate system from global warming.

75

00:07:00,810 --> 00:07:09,100

\h This mission is really a stepping stone, along the path of a long record of sea level rise. In order to understand

76

00:07:09,100 --> 00:07:15,600

\h you really have to measure the earth for a long period of time. OSTM, the Ocean Surface Topography M

77

00:07:15,600 --> 00:07:23,160

\h will extend our record of sea level, almost to 20 years. But 20 years is not all that long in terms of global

78

00:07:23,160 --> 00:07:28,440

\h I mean this has been going on for 100 years or more. So, we definitely need future missions.

79

00:07:28,440 --> 00:07:33,830

\h We definitely need to keep our eyes on the oceans, because that's where a lot of the action is.

80

00:07:33,830 --> 00:07:36,170

\h Tiffany Nail/Launch Services Program, NASA: Thanks for joining us. You can log on