
A MONTH AT SEA:
SCIENTISTS PREPARE TO SET SAIL
FOR NASA'S S-MODE MISSION

1
00:00:05,580 --> 00:00:12,610
foreign

2
00:00:17,510 --> 00:00:15,650
Oregon during the month of October an

3
00:00:19,910 --> 00:00:17,520
environmental research vessel called The

4
00:00:21,769 --> 00:00:19,920
Bold Horizon prepared to embark on a

5
00:00:25,450 --> 00:00:21,779
month-long Journey as part of a

6
00:00:28,849 --> 00:00:25,460
scientific mission called S Mode

7
00:00:31,669 --> 00:00:28,859
so S Mode is one of the NASA Earth

8
00:00:33,950 --> 00:00:31,679
Venture series experiments so it's a big

9
00:00:36,590 --> 00:00:33,960
multi-institutional experiments we're

10
00:00:40,310 --> 00:00:36,600
mostly looking at the upper ocean

11
00:00:43,490 --> 00:00:40,320
velocities how the upper meters of the

12
00:00:46,310 --> 00:00:43,500
ocean move so we're learning that these

13
00:00:48,170 --> 00:00:46,320

small scales small-scale currents are

14
00:00:50,750 --> 00:00:48,180
more and more important for our

15
00:00:53,029 --> 00:00:50,760
understanding of ventilation or how the

16
00:00:55,250 --> 00:00:53,039
upper ocean is interacting with the

17
00:00:58,310 --> 00:00:55,260
atmosphere

18
00:01:00,110 --> 00:00:58,320
so right now it's important to uh we're

19
00:01:01,670 --> 00:01:00,120
unpacking all our packages and

20
00:01:05,030 --> 00:01:01,680
installing instrumentation making sure

21
00:01:07,490 --> 00:01:05,040
everything works everything fits we have

22
00:01:09,730 --> 00:01:07,500
just two days maybe three days just to

23
00:01:12,830 --> 00:01:09,740
do it and it's a lot of work a lot of

24
00:01:14,990 --> 00:01:12,840
instrumentation go up top very to the

25
00:01:19,550 --> 00:01:15,000
top of the ship some go down below

26
00:01:21,770 --> 00:01:19,560
[Music]

27
00:01:23,810 --> 00:01:21,780
so we care about the vertical movement

28
00:01:25,550 --> 00:01:23,820
of things like heat and carbon in the

29
00:01:28,429 --> 00:01:25,560
ocean because it's really important for

30
00:01:30,590 --> 00:01:28,439
climate change so I'm on the biology

31
00:01:32,510 --> 00:01:30,600
team and in terms of biology we care

32
00:01:34,130 --> 00:01:32,520
about how carbon moves throughout the

33
00:01:36,770 --> 00:01:34,140
ocean because if that carbon gets deep

34
00:01:39,109 --> 00:01:36,780
enough in the ocean it stays there and

35
00:01:40,310 --> 00:01:39,119
it's not released to the atmosphere and

36
00:01:41,990 --> 00:01:40,320
that's really important for What's

37
00:01:44,330 --> 00:01:42,000
called the greenhouse effect if you have

38
00:01:46,670 --> 00:01:44,340

more carbon dioxide in the atmosphere

39
00:01:48,590 --> 00:01:46,680
you have more Heating and then in terms

40
00:01:50,929 --> 00:01:48,600
of the physics side we care about things

41
00:01:52,550 --> 00:01:50,939
like temperature and salinity because

42
00:01:55,609 --> 00:01:52,560
the ocean moves around heat and that's

43
00:02:01,000 --> 00:01:55,619
how the ocean controls the world's

44
00:02:10,010 --> 00:02:07,690
[Music]

45
00:02:12,290 --> 00:02:10,020
this is an Imaging flow ciderbot we're

46
00:02:15,110 --> 00:02:12,300
going to use it to look at phytoplankton

47
00:02:16,910 --> 00:02:15,120
Community composition at the sea surface

48
00:02:18,949 --> 00:02:16,920
a little sample from the ship sea water

49
00:02:22,250 --> 00:02:18,959
intake over there

50
00:02:25,190 --> 00:02:22,260
I'm gonna sell flows through

51
00:02:28,190 --> 00:02:25,200
the system from the seawater intake it

52
00:02:31,430 --> 00:02:28,200
will trigger the lasers and then once

53
00:02:32,690 --> 00:02:31,440
that happens the camera will take a

54
00:02:34,550 --> 00:02:32,700
picture

55
00:02:36,890 --> 00:02:34,560
teams of scientists spent the better

56
00:02:44,930 --> 00:02:36,900
part of a week retrofitting the ship for

57
00:02:48,589 --> 00:02:46,250
yeah

58
00:02:51,070 --> 00:02:48,599
I'm just testing this blue this load

59
00:02:54,650 --> 00:02:51,080
will be deployed in this point mission

60
00:02:57,170 --> 00:02:54,660
to measure the vertical velocity

61
00:02:58,970 --> 00:02:57,180
and this is the means this is the

62
00:03:01,130 --> 00:02:58,980
special characteristics of these clothes

63
00:03:04,729 --> 00:03:01,140

because it can move with the water

64
00:03:10,790 --> 00:03:04,739
person so it can measure the w means the

65
00:03:14,270 --> 00:03:12,350
we have

66
00:03:15,949 --> 00:03:14,280
like these two primary disciplines that

67
00:03:17,750 --> 00:03:15,959
are going to be on one boat together and

68
00:03:19,430 --> 00:03:17,760
that's going to be the biology folks

69
00:03:20,809 --> 00:03:19,440
that are trying to understand how the

70
00:03:22,790 --> 00:03:20,819
biology of the ocean is react

71
00:03:23,869 --> 00:03:22,800
interacting with the physics so then we

72
00:03:25,910 --> 00:03:23,879
also have a lot of physical

73
00:03:27,410 --> 00:03:25,920
oceanographers on the boat and it's kind

74
00:03:29,509 --> 00:03:27,420
of bringing us together that we can

75
00:03:31,610 --> 00:03:29,519
piece together this larger story of some

76
00:03:33,350 --> 00:03:31,620
music scale features what's happening on

77
00:03:35,449 --> 00:03:33,360
these smaller scales that are not

78
00:03:37,509 --> 00:03:35,459
currently captured by existing models

79
00:03:40,190 --> 00:03:37,519
and measurements

80
00:03:42,649 --> 00:03:40,200
in addition to the scientific fields on

81
00:03:44,300 --> 00:03:42,659
board the Bold Horizon isn't the only

82
00:03:46,009 --> 00:03:44,310
component of the mission

83
00:03:47,930 --> 00:03:46,019
[Music]

84
00:03:49,670 --> 00:03:47,940
excitement of this project is that a lot

85
00:03:52,670 --> 00:03:49,680
of this is cutting edge

86
00:03:54,890 --> 00:03:52,680
so the interaction of this multiple

87
00:03:57,589 --> 00:03:54,900
platforms is the biggest challenge so we

88
00:03:59,809 --> 00:03:57,599

have three aircraft flying overhead we

89
00:04:02,630 --> 00:03:59,819
have multiple of vehicles on the surface

90
00:04:05,089 --> 00:04:02,640
we have multiple Vehicles underwater

91
00:04:06,770 --> 00:04:05,099
but we will need to navigate our way

92
00:04:07,789 --> 00:04:06,780
through this constellation of

93
00:04:10,970 --> 00:04:07,799
instruments

94
00:04:13,789 --> 00:04:10,980
the other thing is that we are chasing

95
00:04:15,969 --> 00:04:13,799
this really fast ocean features they

96
00:04:19,189 --> 00:04:15,979
change really fast in a matter of hours

97
00:04:20,930 --> 00:04:19,199
that's why having eye in the sky is a

98
00:04:22,969 --> 00:04:20,940
great asset so they will be able to

99
00:04:25,790 --> 00:04:22,979
direct us to just the right spots and we

100
00:04:27,170 --> 00:04:25,800
will try to move all our surface assets

101
00:04:30,650 --> 00:04:27,180
move our

102
00:04:32,800 --> 00:04:30,660
ship to where the action is and be there

103
00:04:37,969 --> 00:04:32,810
right in time

104
00:04:40,249 --> 00:04:37,979
[Music]

105
00:04:43,790 --> 00:04:40,259
for these we are watching radio songs to

106
00:04:45,310 --> 00:04:43,800
measure uh atmospheric that weather in

107
00:04:48,950 --> 00:04:45,320
the atmosphere so temperature pressure

108
00:04:50,570 --> 00:04:48,960
humidity and winds and the reason we're

109
00:04:53,450 --> 00:04:50,580
doing this as part of our field

110
00:04:56,390 --> 00:04:53,460
experiment is because the

111
00:04:59,150 --> 00:04:56,400
um we know from other past evidence that

112
00:05:00,770 --> 00:04:59,160
the ocean can affect the weather and one

113
00:05:03,710 --> 00:05:00,780

thing that we're really interested in is

114
00:05:05,870 --> 00:05:03,720
seeing how big of a change in ocean

115
00:05:07,189 --> 00:05:05,880
temperature or ocean currents can affect

116
00:05:09,469 --> 00:05:07,199
the weather

117
00:05:11,870 --> 00:05:09,479
pray the low cost of the system is it's

118
00:05:13,430 --> 00:05:11,880
just a styrofoam cup really and the

119
00:05:14,370 --> 00:05:13,440
electronics are really the star of the

120
00:05:24,469 --> 00:05:14,380
show here

121
00:05:30,110 --> 00:05:28,010
most exciting thing about this line of

122
00:05:32,270 --> 00:05:30,120
work is that you never know what to

123
00:05:35,270 --> 00:05:32,280
expect so this this sense of discovery

124
00:05:38,150 --> 00:05:35,280
that I think drives most people that go

125
00:05:40,370 --> 00:05:38,160
out to sea we know there will be new

126
00:05:42,230 --> 00:05:40,380
exciting features waiting for us there

127
00:05:44,210 --> 00:05:42,240
we don't know what they are we don't

128
00:05:46,790 --> 00:05:44,220
know where they are we'll be chasing

129
00:05:48,710 --> 00:05:46,800
them we know we will find something that

130
00:05:50,090 --> 00:05:48,720
will motivate us and really get us

131
00:05:51,650 --> 00:05:50,100
excited to keep us you know working

132
00:05:54,350 --> 00:05:51,660
through the nights to actually

133
00:05:56,450 --> 00:05:54,360
understand what it is happening how the