
JLG
TOUCAN 26E

1
00:00:00,960 --> 00:00:04,170
- Welcome to NASA's jet
propulsion laboratory

2
00:00:04,170 --> 00:00:05,730
in Southern California.

3
00:00:05,730 --> 00:00:08,690
Good morning and thanks for
tuning in, I'm Marina Jurica.

4
00:00:08,690 --> 00:00:10,560
And we're here in the viewing gallery

5
00:00:10,560 --> 00:00:13,560
of the spacecraft assembly facility.

6
00:00:13,560 --> 00:00:14,840
And right below me here

7
00:00:14,840 --> 00:00:18,840
is one of our next earth
observing satellites, SWOT,

8
00:00:18,840 --> 00:00:23,130
which stands for Surface
Water Ocean Topography.

9
00:00:23,130 --> 00:00:25,680
Launching in November, 2022,

10
00:00:25,680 --> 00:00:29,090
SWOT will give NASA
its first global survey

11
00:00:29,090 --> 00:00:30,870
of Earth's surface water,

12

00:00:30,870 --> 00:00:34,800
providing data about clean
air and water, extreme events

13
00:00:34,800 --> 00:00:37,550
and long-term environmental changes.

14
00:00:37,550 --> 00:00:40,000
You can join in on the
conversation here live,

15
00:00:40,000 --> 00:00:42,480
by putting your questions
in the comment box,

16
00:00:42,480 --> 00:00:45,560
and we'll get it as we head
throughout the program.

17
00:00:45,560 --> 00:00:47,930
And joining me now is Karen St. Germain,

18
00:00:47,930 --> 00:00:50,060
who is the Earth division science director

19
00:00:50,060 --> 00:00:51,280
at NASA headquarters.

20
00:00:51,280 --> 00:00:53,910
And she's gonna give us
a glimpse into the future

21
00:00:53,910 --> 00:00:55,760
of earth missions for NASA.

22
00:00:55,760 --> 00:00:57,530
And then a little later in the program,

23
00:00:57,530 --> 00:01:00,200

we'll be talking to Parag Vaze,

24
00:01:00,200 --> 00:01:02,360
who's the program manager for SWOT

25
00:01:02,360 --> 00:01:03,430
and he's gonna let us know

26
00:01:03,430 --> 00:01:05,350
what really sets SWOT apart

27
00:01:05,350 --> 00:01:07,850
and makes it unique, so welcome Karen.

28
00:01:07,850 --> 00:01:10,240
- Thank you so much Marina,
it's great to be here with you

29
00:01:10,240 --> 00:01:11,860
and it's great to be at JPL.

30
00:01:11,860 --> 00:01:14,120
- Yes and it's great to actually see SWOT

31
00:01:14,120 --> 00:01:15,500
down right here beside us.

32
00:01:15,500 --> 00:01:17,190
- Absolutely, absolutely.

33
00:01:17,190 --> 00:01:18,430
- So this is an exciting time

34
00:01:18,430 --> 00:01:21,260
and NASA has many NASA
earth science missions

35
00:01:21,260 --> 00:01:23,380

that are orbiting and studying the earth

36
00:01:23,380 --> 00:01:27,140
from the carbon cycle to the
atmosphere to sea level rise.

37
00:01:27,140 --> 00:01:30,140
And what is going to be in the future now

38
00:01:30,140 --> 00:01:33,410
as we head forward with
NASA earth science missions

39
00:01:33,410 --> 00:01:34,810
that we can get excited about?

40
00:01:34,810 --> 00:01:37,930
- Absolutely, so we have
a great year coming up.

41
00:01:37,930 --> 00:01:41,550
We've got uh we've got
five launches coming up,

42
00:01:41,550 --> 00:01:46,530
in the coming year or so
and including SWOT and NISAR

43
00:01:46,530 --> 00:01:48,160
which are both behind us here,

44
00:01:48,160 --> 00:01:49,860
of course, Landsat 9

45
00:01:49,860 --> 00:01:52,950
which is which is our partnership

46
00:01:52,950 --> 00:01:55,990
with USGS as well as Maya

47
00:01:55,990 --> 00:02:00,990
and Emit two other aerosol
inclusion observation systems.

48
00:02:01,010 --> 00:02:05,150
But after that, we are, we
are already starting to build,

49
00:02:05,150 --> 00:02:06,970
starting to move out on the planning

50
00:02:06,970 --> 00:02:09,070
of what we're calling the
Earth System Observatory.

51
00:02:09,070 --> 00:02:10,680
It will be a collection

52
00:02:10,680 --> 00:02:15,680
of missions, instruments that
view the entire earth system

53
00:02:15,880 --> 00:02:18,880
from the atmosphere to the
surface, to the subsurface

54
00:02:18,880 --> 00:02:21,940
to give us a full 3D view of our planet.

55
00:02:21,940 --> 00:02:24,640
- So it's going to be a really
busy next couple of years

56
00:02:24,640 --> 00:02:28,090
for us, which is so exciting
studying our planet earth.

57
00:02:28,090 --> 00:02:30,980

Now I've noticed with many
of the earth science missions

58
00:02:30,980 --> 00:02:33,400
there's a lot of
international collaboration.

59
00:02:33,400 --> 00:02:34,233
Why is that?

60
00:02:34,233 --> 00:02:35,320
And why is that important?

61
00:02:35,320 --> 00:02:37,044
- Oh, it's so important to us.

62
00:02:37,044 --> 00:02:39,110
The, the changes that we're seeing

63
00:02:39,110 --> 00:02:41,630
in our environment are, are global.

64
00:02:41,630 --> 00:02:45,700
And uh and that means we
need the global community

65
00:02:45,700 --> 00:02:48,610
of space faring nations to join with us

66
00:02:48,610 --> 00:02:50,830
to make all of the
observations we need to make

67
00:02:50,830 --> 00:02:53,320
to really understand what's
happening on our planet.

68
00:02:53,320 --> 00:02:55,700
And so are these partnerships really just

69
00:02:55,700 --> 00:02:57,930
multiply what we're able to do.

70
00:02:57,930 --> 00:02:59,950
- And thanks so much for
all of guys tuning in.

71
00:02:59,950 --> 00:03:02,010
We're getting a lot of great
social media questions.

72
00:03:02,010 --> 00:03:04,210
Karen, Jennifer on Twitter asks

73
00:03:04,210 --> 00:03:06,070
will we be sharing this information

74
00:03:06,070 --> 00:03:08,480
with people in other parts of the globe?

75
00:03:08,480 --> 00:03:12,570
- Absolutely. So NASA
has long had a policy

76
00:03:12,570 --> 00:03:14,630
of full, free, and open data.

77
00:03:14,630 --> 00:03:17,110
But one of the things, one
of our major initiatives

78
00:03:17,110 --> 00:03:19,150
right now, something
we're calling open science

79
00:03:19,150 --> 00:03:23,930
and the idea there is to
get all of the data and all

80
00:03:23,930 --> 00:03:26,690
of the models in the
applications that we derive

81
00:03:26,690 --> 00:03:30,370
from the data into one
ecosystem to get data out

82
00:03:30,370 --> 00:03:31,270
to people who need it,

83
00:03:31,270 --> 00:03:33,780
no matter where they are around the globe

84
00:03:33,780 --> 00:03:36,060
- And societal impacts are
so important, especially

85
00:03:36,060 --> 00:03:37,970
to the people who are
watching out there today.

86
00:03:37,970 --> 00:03:39,070
Karen you've spent the bulk

87
00:03:39,070 --> 00:03:41,770
of your career studying
earth science emissions

88
00:03:41,770 --> 00:03:43,760
and previously being with NOAA

89
00:03:43,760 --> 00:03:46,990
how will these earth science
missions collectively

90
00:03:46,990 --> 00:03:49,540
help society and understand

our earth better?

91
00:03:49,540 --> 00:03:51,590
- Yeah. So we get,

92
00:03:51,590 --> 00:03:53,610
we get excited about
building the satellites

93
00:03:53,610 --> 00:03:55,520
and collecting the observations and

94
00:03:55,520 --> 00:03:59,310
but really that's just
the start, the next step,

95
00:03:59,310 --> 00:04:01,530
once we have the
observing systems launched

96
00:04:01,530 --> 00:04:04,010
and we have the observations,
the next step is

97
00:04:04,010 --> 00:04:06,410
really to extract the
scientific understanding

98
00:04:06,410 --> 00:04:07,730
from those observations

99
00:04:07,730 --> 00:04:10,340
the understanding what's
actually happening

100
00:04:10,340 --> 00:04:14,130
and then converting that
into actionable information.

101

00:04:14,130 --> 00:04:15,390
People at

102
00:04:15,390 --> 00:04:18,400
at every level need
information to make decisions.

103
00:04:18,400 --> 00:04:21,030
We're very familiar
with NOAA's mission with

104
00:04:21,030 --> 00:04:23,400
with weather prediction
and severe weather warning.

105
00:04:23,400 --> 00:04:27,310
And of course that helps people
prepare in the near term.

106
00:04:27,310 --> 00:04:30,210
We're also wanting, we
want to help people prepare

107
00:04:30,210 --> 00:04:33,210
for the long-term changes
that are coming, and that's

108
00:04:33,210 --> 00:04:35,900
that's important at the
federal, state, local,

109
00:04:35,900 --> 00:04:37,510
tribal levels.

110
00:04:37,510 --> 00:04:40,090
It's also important for
the private sector there.

111
00:04:40,090 --> 00:04:42,810
They have to be able to

plan for risks as well.

112
00:04:42,810 --> 00:04:45,420
So the idea is, get this information

113
00:04:45,420 --> 00:04:47,800
out there where people can make use

114
00:04:47,800 --> 00:04:51,380
of it to make better,
science informed decisions.

115
00:04:51,380 --> 00:04:52,213
- And that's what's great.

116
00:04:52,213 --> 00:04:54,190
And what's incredible
about all this information,

117
00:04:54,190 --> 00:04:57,820
Karen, is it's, it's
accessible to everybody.

118
00:04:57,820 --> 00:04:59,310
- Absolutely. In fact, part

119
00:04:59,310 --> 00:05:02,390
of the open science
initiative not only is to

120
00:05:02,390 --> 00:05:06,360
get information out there,
but it's also to get more

121
00:05:06,360 --> 00:05:10,060
more people working on our data and

122
00:05:10,060 --> 00:05:13,580
and joining us in asking a broader variety

123
00:05:13,580 --> 00:05:16,660
of questions that we can
answer with our data.

124
00:05:16,660 --> 00:05:19,520
So it's, we're, we're trying to lower the

125
00:05:19,520 --> 00:05:23,560
any barriers to access through
this initiative as well.

126
00:05:23,560 --> 00:05:26,700
- And it's so important
to get the prognostics

127
00:05:26,700 --> 00:05:29,050
into the models, make them better.

128
00:05:29,050 --> 00:05:32,260
Get the earlier warning signals
out for places like NOAA

129
00:05:32,260 --> 00:05:33,560
the National Weather Service

130
00:05:33,560 --> 00:05:35,140
and each earth satellite that we put

131
00:05:35,140 --> 00:05:37,030
up there is a part of that.

132
00:05:37,030 --> 00:05:40,550
- Absolutely. We, we assimilate the data

133
00:05:40,550 --> 00:05:42,940
from all of our observing systems.

134

00:05:42,940 --> 00:05:45,450
And as you said, capture it in models

135
00:05:45,450 --> 00:05:48,530
and it's the models that give
us the predictive capability.

136
00:05:48,530 --> 00:05:50,990
The observations tell
us what's happening now

137
00:05:50,990 --> 00:05:54,030
but it's the models that
help us see into the future.

138
00:05:54,030 --> 00:05:57,869
And that's really where
we get the maximum benefit

139
00:05:57,869 --> 00:05:59,870
from these observations.

140
00:05:59,870 --> 00:06:01,210
- That's great. We've got another question

141
00:06:01,210 --> 00:06:03,370
on Facebook from Genie asking

142
00:06:03,370 --> 00:06:05,910
how did you personally
get into earth science?

143
00:06:05,910 --> 00:06:09,530
- Ah well, so going all the way back to

144
00:06:09,530 --> 00:06:11,550
to my undergraduate days, I

145
00:06:11,550 --> 00:06:16,550

I loved physics and engineering
and, uh and I found my way

146
00:06:16,670 --> 00:06:20,000
into a terrific graduate
program that really

147
00:06:20,000 --> 00:06:23,730
that looked at earth
science from end to end.

148
00:06:23,730 --> 00:06:26,470
And I always loved solving problems.

149
00:06:26,470 --> 00:06:27,890
Uh you know, I did puzzles

150
00:06:27,890 --> 00:06:31,270
as a kid and I was always
romping around, out in nature.

151
00:06:31,270 --> 00:06:34,770
So this seemed like a great marriage

152
00:06:34,770 --> 00:06:38,550
and that graduate program
was had a hardware element.

153
00:06:38,550 --> 00:06:41,120
We built instruments, we
took them to the field

154
00:06:41,120 --> 00:06:43,790
we did scientific work
and we presented the work.

155
00:06:43,790 --> 00:06:46,640
And so it really perfectly prepared me

156

00:06:46,640 --> 00:06:49,810
for a career to get to where I am today.

157
00:06:49,810 --> 00:06:51,070
Right? Where were we

158
00:06:51,070 --> 00:06:54,970
we look at that whole end-to-end
scientific value chain,

159
00:06:54,970 --> 00:06:57,940
but I I'm here because I love this earth.

160
00:06:57,940 --> 00:06:59,561
I, and honestly

161
00:06:59,561 --> 00:07:03,110
the other part about earth
science, you know, we, we talk

162
00:07:03,110 --> 00:07:06,700
about the earth a lot, but
it's really about the people

163
00:07:06,700 --> 00:07:11,026
because you know, the,
the, the earth changes.

164
00:07:11,026 --> 00:07:14,080
It, it in, in the earth is resilient.

165
00:07:14,080 --> 00:07:16,600
The question for us is how are

166
00:07:16,600 --> 00:07:18,760
how resilient are we going to be

167
00:07:18,760 --> 00:07:19,870
in the face of these changes?

168
00:07:19,870 --> 00:07:23,380
And so it's, that's a big
motivator for me as well.

169
00:07:23,380 --> 00:07:24,213
- Well, Karen that's right.

170
00:07:24,213 --> 00:07:25,560
We all live on this earth together

171
00:07:25,560 --> 00:07:27,210
and it's all our jobs to protect it.

172
00:07:27,210 --> 00:07:28,043
That's for sure.

173
00:07:28,043 --> 00:07:28,946
- Absolutely.

174
00:07:28,946 --> 00:07:30,340
- Thank you so much for
joining us here today.

175
00:07:30,340 --> 00:07:31,330
- Thank you so much.

176
00:07:31,330 --> 00:07:34,360
It's great to be here
and, and see the hardware.

177
00:07:34,360 --> 00:07:36,660
- Yes. Wonderful. Safe travels back home.

178
00:07:36,660 --> 00:07:37,820
- Thank you.

179
00:07:37,820 --> 00:07:39,710

- Remember if you'd like to
ask the mission a question

180
00:07:39,710 --> 00:07:41,140
just make sure you pop that question

181
00:07:41,140 --> 00:07:44,110
in the comment box and
we'll try to get it answered

182
00:07:44,110 --> 00:07:46,890
for you as we head into
the rest of the program.

183
00:07:46,890 --> 00:07:48,000
Now here at JPL

184
00:07:48,000 --> 00:07:51,090
we have been completing some
very critical testing on SWOT

185
00:07:51,090 --> 00:07:54,050
which you can see right
here in the clean room.

186
00:07:54,050 --> 00:07:57,489
And this testing is very
important because it makes sure

187
00:07:57,489 --> 00:08:01,670
that the satellite can survive
launch and be in space.

188
00:08:01,670 --> 00:08:03,900
Now, SWOT is getting ready
to be shipped to France

189
00:08:03,900 --> 00:08:06,990
soon, as our partners
CNES the French Space

190
00:08:06,990 --> 00:08:10,250
Agency finished preparing
the satellite for launch.

191
00:08:10,250 --> 00:08:14,160
So joining me right now is
project manager, Parag Vaze.

192
00:08:14,160 --> 00:08:15,300
Good morning, Parag.

193
00:08:15,300 --> 00:08:16,200
- Good morning Marina.

194
00:08:16,200 --> 00:08:18,260
Happy to be here. I'm excited.

195
00:08:18,260 --> 00:08:19,119
- So excited. I know!

196
00:08:19,119 --> 00:08:21,390
- Excited, really excited
with what you just saw.

197
00:08:21,390 --> 00:08:24,100
So we're, we're very happy and

198
00:08:24,100 --> 00:08:25,970
and getting prepared for our next step.

199
00:08:25,970 --> 00:08:28,831
- That's so great. And it's
so amazing to see it here

200
00:08:28,831 --> 00:08:32,030
in all its glory and SWOT
is right below us here.

201
00:08:32,030 --> 00:08:34,460
Can you tell us a little
bit about how it works

202
00:08:34,460 --> 00:08:36,940
and what your team's going to
be doing to prepare to ship it

203
00:08:36,940 --> 00:08:38,690
over to France in the
next couple of weeks?

204
00:08:38,690 --> 00:08:39,800
- Right. So, first of all

205
00:08:39,800 --> 00:08:43,370
what you're seeing is the
product of about 10 years

206
00:08:43,370 --> 00:08:46,797
of work with hundreds of
people, engineers, scientists

207
00:08:46,797 --> 00:08:49,209
and one of the major features of

208
00:08:49,209 --> 00:08:52,220
of what you're seeing here is really all

209
00:08:52,220 --> 00:08:54,860
of the instrumentation for the satellite

210
00:08:54,860 --> 00:08:56,550
what's called the payload module.

211
00:08:56,550 --> 00:08:59,360
Within that we have six
intr- science instruments

212
00:08:59,360 --> 00:09:01,820
along with all of the supporting hardware.

213
00:09:01,820 --> 00:09:04,000
And then one of the main
features that we have

214
00:09:04,000 --> 00:09:07,677
for SWOT that really sets it
apart is a new radar system.

215
00:09:07,677 --> 00:09:11,890
That's called the KA Band
Radar Interferometer it's,

216
00:09:11,890 --> 00:09:14,990
it does a very high precision,
wide swath measurement.

217
00:09:14,990 --> 00:09:18,750
So we really want to be
able to sense the water,

218
00:09:18,750 --> 00:09:21,820
the water height, the water
slope, all across the world.

219
00:09:21,820 --> 00:09:25,850
And uh this radar system
will basically bounce signals

220
00:09:25,850 --> 00:09:28,390
to the surface, receive
them to the two antennas

221
00:09:28,390 --> 00:09:30,880
and help us understand the height and the

222
00:09:30,880 --> 00:09:33,750

and the slope of the, of, of
the water that we're seeing.

223
00:09:33,750 --> 00:09:35,500
- And can you point KaRin out to us?

224
00:09:35,500 --> 00:09:40,280
- Yeah, so KaRin, first of
all, is the things that you see

225
00:09:40,280 --> 00:09:43,160
are are actually not as visible, but the

226
00:09:43,160 --> 00:09:46,520
all of the white structure
that you see sort of

227
00:09:46,520 --> 00:09:49,238
the bottom two thirds of
the payload module houses

228
00:09:49,238 --> 00:09:52,030
all of the electronics,
but the basic biggest,

229
00:09:52,030 --> 00:09:55,920
visible feature are the antennas
that are stowed right now.

230
00:09:55,920 --> 00:09:57,020
They're large antennas.

231
00:09:57,020 --> 00:10:00,660
That'll basically deploy
out and then extend out.

232
00:10:00,660 --> 00:10:03,500
And that'll be about 15 feet on each side

233

00:10:03,500 --> 00:10:06,990
along with about 10 feet
of antennas on each side.

234
00:10:06,990 --> 00:10:09,460
So that is the main visible feature.

235
00:10:09,460 --> 00:10:12,820
And all the electronics are
inside the payload module.

236
00:10:12,820 --> 00:10:13,653
- Now we've talked

237
00:10:13,653 --> 00:10:15,770
about all the critical testing
we've been doing here at JPL.

238
00:10:15,770 --> 00:10:17,450
Why is that important?

239
00:10:17,450 --> 00:10:19,970
I know they're doing
metrology testing today

240
00:10:19,970 --> 00:10:21,746
- Right, so first of all

241
00:10:21,746 --> 00:10:25,240
what we do as we're
developing the whole system

242
00:10:25,240 --> 00:10:28,130
is we build each system,
we test each system

243
00:10:28,130 --> 00:10:28,963
we then assemble it

244

00:10:28,963 --> 00:10:32,360
to the next higher level of
integration and test it again.

245
00:10:32,360 --> 00:10:35,840
And this is right now has finished all

246
00:10:35,840 --> 00:10:39,610
of the functional performance
and environmental testing.

247
00:10:39,610 --> 00:10:43,170
So the environmental testing
is that last piece to check

248
00:10:43,170 --> 00:10:44,280
that it's ready for space.

249
00:10:44,280 --> 00:10:45,540
It's not only ready for space

250
00:10:45,540 --> 00:10:48,320
but it's ready for the ride to space.

251
00:10:48,320 --> 00:10:50,520
And it's very important to make sure so

252
00:10:50,520 --> 00:10:54,120
that when we get to that next
step, we don't discover some

253
00:10:54,120 --> 00:10:57,400
some sort of new features that
we have to go back and fix

254
00:10:57,400 --> 00:10:58,960
but we're in very good shape.

255
00:10:58,960 --> 00:11:02,410

We've completed all of that
testing and ready to mate

256
00:11:02,410 --> 00:11:06,677
with our hardware, which is
our spacecraft bus provided

257
00:11:06,677 --> 00:11:08,800
by the French Space Agency in France.

258
00:11:08,800 --> 00:11:11,405
- So shipping off to
the French Space Agency

259
00:11:11,405 --> 00:11:12,238
in the next couple weeks.

260
00:11:12,238 --> 00:11:13,266
- Shipping of to, yeah.

261
00:11:13,266 --> 00:11:14,280
And at the end of June, we're planning

262
00:11:14,280 --> 00:11:19,270
on shipping this whole structure
out to France and mating it

263
00:11:19,270 --> 00:11:22,190
with the spacecraft
platform, which will be about

264
00:11:22,190 --> 00:11:25,190
about two-thirds of what you see here and

265
00:11:25,190 --> 00:11:27,337
and mating that whole structure together.

266
00:11:27,337 --> 00:11:30,765
And then starting, it's a

final journey toward testing.

267
00:11:30,765 --> 00:11:32,640
And then, and then launch

268
00:11:32,640 --> 00:11:33,690
- Later next year.

269
00:11:33,690 --> 00:11:36,390
And we talked about your
journey many times, Parag

270
00:11:36,390 --> 00:11:37,930
your entire career has been

271
00:11:37,930 --> 00:11:40,300
on earth science mission now for decades.

272
00:11:40,300 --> 00:11:43,000
And we're getting a lot of
great social media questions.

273
00:11:43,000 --> 00:11:45,000
And this one's awesome
from Edgar on Facebook

274
00:11:45,000 --> 00:11:48,250
asking what were and are your inspirations

275
00:11:48,250 --> 00:11:51,750
for this concept, informing
the SWOT satellite?

276
00:11:51,750 --> 00:11:52,583
And like you said

277
00:11:52,583 --> 00:11:55,060
your journey been on all
earth science missions.

278
00:11:55,060 --> 00:11:57,580
So what has made this one stand out?

279
00:11:57,580 --> 00:12:02,500
- So, first of all, I, I got
into really being fascinated

280
00:12:02,500 --> 00:12:04,950
with satellites in space, even as a child

281
00:12:04,950 --> 00:12:07,490
but really I was fortunate to work

282
00:12:07,490 --> 00:12:11,500
in earth science because it's
something very tangible to me.

283
00:12:11,500 --> 00:12:14,348
We see results of that very quickly

284
00:12:14,348 --> 00:12:16,940
from the projects that we've worked on.

285
00:12:16,940 --> 00:12:19,440
And almost every project we we've set

286
00:12:19,440 --> 00:12:21,600
out we've achieved that
goal, but what's really

287
00:12:21,600 --> 00:12:26,160
exciting is all the things we
learned that we didn't expect.

288
00:12:26,160 --> 00:12:29,610
And that every time we do one
of these satellite campaigns

289
00:12:29,610 --> 00:12:32,775
it's very exciting to not only see what we

290
00:12:32,775 --> 00:12:35,521
we of course expected, but all

291
00:12:35,521 --> 00:12:38,390
of the tremendous
possibilities that it opens

292
00:12:38,390 --> 00:12:41,978
up and that's going to be
really the future for SWOT

293
00:12:41,978 --> 00:12:45,010
because we're expecting
a brand new measurement

294
00:12:45,010 --> 00:12:49,460
over the inland waters and
exploring that whole area.

295
00:12:49,460 --> 00:12:52,410
That's, that's not really
been seen before as a

296
00:12:52,410 --> 00:12:53,600
as a full world.

297
00:12:53,600 --> 00:12:56,260
- And keying that information in for folks

298
00:12:56,260 --> 00:13:00,140
at home here is that SWOT
will see the inland water

299
00:13:00,140 --> 00:13:02,010
which we haven't been able to see before.

300
00:13:02,010 --> 00:13:04,120
So tell us why that's impactful.

301
00:13:04,120 --> 00:13:07,940
- Yeah. So SWOT, the name,
it doesn't say oceans

302
00:13:07,940 --> 00:13:10,140
it says surface water, right?

303
00:13:10,140 --> 00:13:13,210
So all of the water that
we are able to sense

304
00:13:13,210 --> 00:13:17,330
from space, oceans,
rivers, any larger body

305
00:13:17,330 --> 00:13:19,766
of water that we are able to observe

306
00:13:19,766 --> 00:13:23,320
we're going to see that
it's going to be one

307
00:13:23,320 --> 00:13:26,390
of those features that we
really haven't seen before

308
00:13:26,390 --> 00:13:29,910
for fresh water on
hydrology as we call it.

309
00:13:29,910 --> 00:13:33,359
And that's something that
is really tremendous again

310
00:13:33,359 --> 00:13:34,760
in everyday life.

311
00:13:34,760 --> 00:13:35,770
I don't need to explain

312
00:13:35,770 --> 00:13:39,794
to people how important it
is to have fresh water coming

313
00:13:39,794 --> 00:13:41,720
that they're using daily.

314
00:13:41,720 --> 00:13:43,460
Right? So that connection

315
00:13:43,460 --> 00:13:46,780
of understanding is, is just tremendous.

316
00:13:46,780 --> 00:13:47,900
- And along those lines

317
00:13:47,900 --> 00:13:50,890
how will SWOT help those
people who are impacted

318
00:13:50,890 --> 00:13:53,230
by those bodies of water
who live near those bodies?

319
00:13:53,230 --> 00:13:54,260
- Right. Right.

320
00:13:54,260 --> 00:13:56,370
So Karen just talked a little bit earlier

321
00:13:56,370 --> 00:13:59,300
about how we use the data
and provide the data.

322

00:13:59,300 --> 00:14:03,700
So our plan is to provide
that data very quickly, maybe

323
00:14:03,700 --> 00:14:07,310
within a few days of exactly
what we're, we're observing

324
00:14:07,310 --> 00:14:10,810
there's lots of direct
applications that are happening.

325
00:14:10,810 --> 00:14:12,950
And then of course, providing that data

326
00:14:12,950 --> 00:14:16,530
for understanding other
patterns as we go out further

327
00:14:16,530 --> 00:14:21,090
but things where we're have
floods, we want to understand

328
00:14:21,090 --> 00:14:24,670
and provide that data as
quickly as we can for the people

329
00:14:24,670 --> 00:14:29,650
the decision-makers and SWOT
within just a overflight

330
00:14:29,650 --> 00:14:33,350
within a few days, we'll be
able to provide very clear maps

331
00:14:33,350 --> 00:14:34,930
of exactly what's happening.

332
00:14:34,930 --> 00:14:36,700
- Our next question comes from Bradley

333
00:14:36,700 --> 00:14:40,090
on Facebook asking will
SQAT be utilizing SAR

334
00:14:40,090 --> 00:14:42,580
data harmonization with SMAPP and NISAR

335
00:14:42,580 --> 00:14:45,130
measurements would be
a fantastic application

336
00:14:45,130 --> 00:14:48,518
for modeling future ecosystem scenarios.

337
00:14:48,518 --> 00:14:51,628
- Right, so yes, it's, it's
using interferometric SAR

338
00:14:51,628 --> 00:14:53,600
synthetic aperture radar.

339
00:14:53,600 --> 00:14:56,860
That is the key to the
new current instrument.

340
00:14:56,860 --> 00:15:01,390
And yes, it's our goal that
the measurements that SWOT is

341
00:15:01,390 --> 00:15:04,360
providing stand alone
are very power- powerful

342
00:15:04,360 --> 00:15:08,070
but really combined with
NISAR and other data sets

343
00:15:08,070 --> 00:15:12,250

and observations is really
going to be a tremendous amount

344
00:15:12,250 --> 00:15:15,970
of additional information to
answer those tough questions

345
00:15:15,970 --> 00:15:18,830
- And Emerson on Facebook
asks, what is the type

346
00:15:18,830 --> 00:15:21,700
of technology you use
to make the measurements

347
00:15:21,700 --> 00:15:23,350
which is a little along what
you were just talking about.

348
00:15:23,350 --> 00:15:25,890
- Right? So, you know, the, the genesis

349
00:15:25,890 --> 00:15:28,600
of this idea is actually
from a prior shuttle

350
00:15:28,600 --> 00:15:31,280
mission called the Shuttle
Radar Topography Mission.

351
00:15:31,280 --> 00:15:32,520
So the basic concept

352
00:15:32,520 --> 00:15:36,250
of interferometry has been
demonstrated and used before.

353
00:15:36,250 --> 00:15:39,630
That was actually used
to sense the solid earth

354
00:15:39,630 --> 00:15:40,950
and map the solid earth.

355
00:15:40,950 --> 00:15:45,290
And we thought, hey, why can't
we do this for the ocean?

356
00:15:45,290 --> 00:15:48,080
And, and we can, we, it
turns out we can do it.

357
00:15:48,080 --> 00:15:50,050
It is a tough problem to do

358
00:15:50,050 --> 00:15:52,790
because those measurements really have to

359
00:15:52,790 --> 00:15:55,860
be done very high power
radar, lots of data

360
00:15:55,860 --> 00:15:57,150
and lots of stability.

361
00:15:57,150 --> 00:15:58,060
You name it.

362
00:15:58,060 --> 00:15:59,990
Everything is about stability

363
00:15:59,990 --> 00:16:02,600
but we were able to have
that technology to design

364
00:16:02,600 --> 00:16:05,350
in that stability and those capabilities

365

00:16:05,350 --> 00:16:09,250
and data processing, even
on board to enable this now.

366
00:16:09,250 --> 00:16:11,210
- Well, thanks so much
for joining us here, Parag

367
00:16:11,210 --> 00:16:12,410
and good luck to you and your team

368
00:16:12,410 --> 00:16:14,710
as you prepare to ship off to France.

369
00:16:14,710 --> 00:16:15,543
- Thank you.

370
00:16:15,543 --> 00:16:16,376
We're really excited.

371
00:16:16,376 --> 00:16:19,030
And we're excited to see
everybody following us

372
00:16:19,030 --> 00:16:19,980
in our journey.

373
00:16:19,980 --> 00:16:20,813
- That's wonderful.

374
00:16:20,813 --> 00:16:22,290
Thank you so much, Parag.

375
00:16:22,290 --> 00:16:24,620
Now, as we mentioned before,
SWOT is going to be launching

376
00:16:24,620 --> 00:16:26,360
from Vandenberg Air Force Base

377
00:16:26,360 --> 00:16:30,540
which is in central California
in November of 2022.

378
00:16:30,540 --> 00:16:33,810
So late next year, and taking a final look

379
00:16:33,810 --> 00:16:35,890
at SWOT here in the clean room

380
00:16:35,890 --> 00:16:38,220
you can get the very
latest from this mission.

381
00:16:38,220 --> 00:16:41,160
Just follow @NASAJPL and @NASAEarth

382
00:16:41,160 --> 00:16:44,500
on Twitter and Facebook, and
for more in-depth information

383
00:16:44,500 --> 00:16:49,500
visit swot.jpl.nasa.gov
at NASA earth science.

384
00:16:51,700 --> 00:16:54,280
Your home is our mission.

385
00:16:54,280 --> 00:16:55,790
Thank you so much for watching