
EARTH
SWOT


SWOT

1
00:00:06,110 --> 00:00:03,110
hello everyone and thanks for joining us

2
00:00:08,990 --> 00:00:06,120
here at Nasa jpl's Instagram live page

3
00:00:11,509 --> 00:00:09,000
I'm meteor world I'm Marina jurika and I

4
00:00:14,450 --> 00:00:11,519
am here live in Southern California at

5
00:00:16,550 --> 00:00:14,460
NASA's jet propulsion laboratory and we

6
00:00:20,330 --> 00:00:16,560
are going to do an exciting chat today

7
00:00:22,250 --> 00:00:20,340
about the SWAT satellite and the SWAT

8
00:00:25,550 --> 00:00:22,260
satellite just launched from Vandenberg

9
00:00:28,609 --> 00:00:25,560
space Force Base last month and the swap

10
00:00:30,589 --> 00:00:28,619
mission is a joint Mission between NASA

11
00:00:34,310 --> 00:00:30,599
and kness which is the French space

12
00:00:38,090 --> 00:00:34,320
agency and SWAT is going to be able to

13
00:00:40,970 --> 00:00:38,100

track water on more than 90 percent of

14
00:00:43,490 --> 00:00:40,980
the Earth's surface and we are super

15
00:00:45,229 --> 00:00:43,500
excited to talk to you about this

16
00:00:47,750 --> 00:00:45,239
satellite today in just a few moments

17
00:00:51,470 --> 00:00:47,760
I'm going to bring in Mark samard who is

18
00:00:53,810 --> 00:00:51,480
a senior scientist here at JPL and he

19
00:00:55,910 --> 00:00:53,820
has seen firsthand how climate change

20
00:00:58,010 --> 00:00:55,920
has really affected the water bodies

21
00:01:01,250 --> 00:00:58,020
across the planet and he's going to tell

22
00:01:03,950 --> 00:01:01,260
us a little bit about how SWAT is going

23
00:01:06,710 --> 00:01:03,960
to be able to track and monitor those

24
00:01:09,350 --> 00:01:06,720
changes from climate change so bear with

25
00:01:12,710 --> 00:01:09,360
me here just one moment while I bring

26
00:01:18,469 --> 00:01:12,720
Mark into the conversation from our

27
00:01:22,670 --> 00:01:18,479
sister Channel NASA climate change and

28
00:01:27,289 --> 00:01:24,609
switched in middle of December

29
00:01:30,289 --> 00:01:27,299
successfully from Vandenberg space force

30
00:01:32,149 --> 00:01:30,299
base and now it is deploying its solar

31
00:01:33,950 --> 00:01:32,159
arrays and different instruments and

32
00:01:35,870 --> 00:01:33,960
getting testing done and we're super

33
00:01:38,870 --> 00:01:35,880
excited for that data to come down hello

34
00:01:40,789 --> 00:01:38,880
Mark hello Marina are you doing great

35
00:01:41,810 --> 00:01:40,799
thank you so much for joining us here

36
00:01:43,130 --> 00:01:41,820
today

37
00:01:45,050 --> 00:01:43,140
thank you

38
00:01:47,390 --> 00:01:45,060

so tell us a little bit about where you

39
00:01:49,370 --> 00:01:47,400
are and what's behind you so currently I

40
00:01:51,410 --> 00:01:49,380
mean the one government auditorium at

41
00:01:53,870 --> 00:01:51,420
the jet propulsion laboratory Pasadena

42
00:01:57,530 --> 00:01:53,880
California on our beautiful planet Earth

43
00:02:00,410 --> 00:01:57,540
and I'm standing in front of a one-third

44
00:02:03,109 --> 00:02:00,420
model of SWAT the surface water and

45
00:02:05,690 --> 00:02:03,119
ocean topography so the the actual

46
00:02:08,029 --> 00:02:05,700
satellite is three times as big as this

47
00:02:10,070 --> 00:02:08,039
one so this is pretty small actually

48
00:02:12,949 --> 00:02:10,080
these antennas that you see here well

49
00:02:16,670 --> 00:02:12,959
you see part of it only but they are 10

50
00:02:19,250 --> 00:02:16,680
meters wide so 30 feet wide

51
00:02:21,589 --> 00:02:19,260
now SWAT has already launched into orbit

52
00:02:23,330 --> 00:02:21,599
as I mentioned before you joined us Mark

53
00:02:26,210 --> 00:02:23,340
and the real work is just getting

54
00:02:28,070 --> 00:02:26,220
started so tell us what SWAT stands for

55
00:02:31,369 --> 00:02:28,080
and what your part of the mission is

56
00:02:35,030 --> 00:02:31,379
okay SWAT is an acronym so surface water

57
00:02:37,250 --> 00:02:35,040
and ocean topography so as its name says

58
00:02:39,229 --> 00:02:37,260
it's going to measure topography so the

59
00:02:40,910 --> 00:02:39,239
Topography is just the height right so

60
00:02:44,089 --> 00:02:40,920
it's the height of the oceans the

61
00:02:45,949 --> 00:02:44,099
heights of the lakes and the rivers and

62
00:02:50,089 --> 00:02:45,959
it will make that with unprecedented

63
00:02:51,710 --> 00:02:50,099

accuracy and with very very wide spatial

64
00:02:53,809 --> 00:02:51,720
coverage

65
00:02:56,990 --> 00:02:53,819
and what is your part of the mission

66
00:02:58,850 --> 00:02:57,000
Mark so my part of the mission so I'm a

67
00:03:02,330 --> 00:02:58,860
principal investigator within the

68
00:03:06,050 --> 00:03:02,340
Schwartz science team so my component is

69
00:03:08,750 --> 00:03:06,060
actually the end in surface water and

70
00:03:11,630 --> 00:03:08,760
ocean topography because I'm interested

71
00:03:13,369 --> 00:03:11,640
in coastal areas so coastal areas are

72
00:03:16,790 --> 00:03:13,379
very interesting because it's basically

73
00:03:20,330 --> 00:03:16,800
where the interaction of the rivers and

74
00:03:22,729 --> 00:03:20,340
the ocean tides come into play so you

75
00:03:25,430 --> 00:03:22,739
have the fresh water coming in and the

76
00:03:28,309 --> 00:03:25,440
salt water coming in and out and pushing

77
00:03:30,229 --> 00:03:28,319
back and forth that fresh water from the

78
00:03:33,830 --> 00:03:30,239
river it's like you have an eternal

79
00:03:35,449 --> 00:03:33,840
dance between the river and the ocean

80
00:03:37,729 --> 00:03:35,459
it's beautiful there's a lot of

81
00:03:41,750 --> 00:03:37,739
processes happening there it's very very

82
00:03:43,750 --> 00:03:41,760
Dynamic it's also very productive this

83
00:03:46,250 --> 00:03:43,760
is where you find Mangrove ecosystems

84
00:03:49,430 --> 00:03:46,260
marshes salt marshes even freshwater

85
00:03:54,550 --> 00:03:49,440
marshes like in Louisiana and

86
00:03:58,550 --> 00:03:54,560
this is uh where a lot of Life happens

87
00:04:00,649 --> 00:03:58,560
and this life and everything that is

88
00:04:04,009 --> 00:04:00,659

sustains whether it's it's fish

89
00:04:06,770 --> 00:04:04,019
crustacean also sustain the livelihood

90
00:04:09,289 --> 00:04:06,780
the livelihood of millions of people so

91
00:04:12,410 --> 00:04:09,299
these are really really important areas

92
00:04:13,309 --> 00:04:12,420
not only scientifically but also for the

93
00:04:16,610 --> 00:04:13,319
people

94
00:04:18,710 --> 00:04:16,620
that's right the wetlands are like a

95
00:04:22,069 --> 00:04:18,720
barrier a lot of folks here at home

96
00:04:23,930 --> 00:04:22,079
don't know how protective these places

97
00:04:26,390 --> 00:04:23,940
are and I know when you and I were in

98
00:04:28,370 --> 00:04:26,400
Louisiana together we saw so much of

99
00:04:30,830 --> 00:04:28,380
this it's not only for infrastructure

100
00:04:33,110 --> 00:04:30,840
and for people but like you said who

101
00:04:35,689 --> 00:04:33,120
inhabits the Wetland so tell us a little

102
00:04:38,590 --> 00:04:35,699
bit about the benefits you are seeing

103
00:04:41,570 --> 00:04:38,600
from conservation in that area but also

104
00:04:44,090 --> 00:04:41,580
the loss of the wetlands which is so

105
00:04:46,610 --> 00:04:44,100
critical to contain so

106
00:04:49,129 --> 00:04:46,620
uh because we have long time series of

107
00:04:50,930 --> 00:04:49,139
data say from the landsat archive for

108
00:04:53,870 --> 00:04:50,940
example we can go back all the way to

109
00:04:57,170 --> 00:04:53,880
the 70s 80s we've seen a lot of land

110
00:05:00,950 --> 00:04:57,180
loss in these coastal wetlands whether

111
00:05:03,050 --> 00:05:00,960
they're marshes or Mangrove forests it

112
00:05:06,290 --> 00:05:03,060
can be due to It's a combination of

113
00:05:10,370 --> 00:05:06,300

climate change and also human impact of

114
00:05:13,370 --> 00:05:10,380
course so the the role of human cannot

115
00:05:17,510 --> 00:05:13,380
be neglected and the benefits of these

116
00:05:20,390 --> 00:05:17,520
uh Wetlands to man is also not to be

117
00:05:23,450 --> 00:05:20,400
neglected is is very important so these

118
00:05:25,670 --> 00:05:23,460
ecosystems protect us against the impact

119
00:05:30,409 --> 00:05:25,680
of climate change whether it's the fact

120
00:05:31,570 --> 00:05:30,419
that sea level rises or the intensity or

121
00:05:35,629 --> 00:05:31,580
the

122
00:05:37,969 --> 00:05:35,639
intensifying impact of hurricanes for

123
00:05:41,450 --> 00:05:37,979
example and storms the act as a buffer

124
00:05:43,310 --> 00:05:41,460
that protect us against these impact and

125
00:05:45,830 --> 00:05:43,320
we've seen that in several areas around

126
00:05:48,650 --> 00:05:45,840
the world where there is in Southeast

127
00:05:51,710 --> 00:05:48,660
Asia or even Louisiana the Everglades

128
00:05:53,689 --> 00:05:51,720
National Park so these these ecosystems

129
00:05:56,270 --> 00:05:53,699
are really important and they protect us

130
00:05:58,790 --> 00:05:56,280
so I think it's also our duty to protect

131
00:06:01,730 --> 00:05:58,800
this ecosystem and I think that's one of

132
00:06:04,270 --> 00:06:01,740
the things what will help us do is to

133
00:06:09,650 --> 00:06:04,280
better understand how these ecosystem

134
00:06:11,810 --> 00:06:09,660
can be helped to continue and protect us

135
00:06:14,270 --> 00:06:11,820
because the interaction between these

136
00:06:17,210 --> 00:06:14,280
ecosystems and the water is critical

137
00:06:19,430 --> 00:06:17,220
this the thrive in these regions where

138
00:06:22,070 --> 00:06:19,440

you have the mix of fresh water and salt

139
00:06:24,050 --> 00:06:22,080
water so I think sword here will be

140
00:06:26,689 --> 00:06:24,060
really really helpful

141
00:06:29,809 --> 00:06:26,699
yes it's hope for the future which is

142
00:06:32,330 --> 00:06:29,819
great mark So speaking about Dynamic

143
00:06:34,129 --> 00:06:32,340
environments and unusual weather here in

144
00:06:36,050 --> 00:06:34,139
California we have tapped into an

145
00:06:38,809 --> 00:06:36,060
atmospheric River and we've been seeing

146
00:06:40,909 --> 00:06:38,819
some very unusual weather coming in from

147
00:06:43,129 --> 00:06:40,919
the Pacific Ocean now we are getting as

148
00:06:47,090 --> 00:06:43,139
much rain as we usually see in an entire

149
00:06:50,570 --> 00:06:47,100
season in a week tell us how SWAT is

150
00:06:53,629 --> 00:06:50,580
going to be able to show us atmospheric

151
00:06:55,730 --> 00:06:53,639
rivers in the future yes so SWAT will

152
00:06:59,210 --> 00:06:55,740
not see those atmospheric Rivers

153
00:07:02,809 --> 00:06:59,220
directly however it will be able to

154
00:07:05,270 --> 00:07:02,819
observe the the impact it has once the

155
00:07:07,670 --> 00:07:05,280
water hits the ground it goes into the

156
00:07:10,430 --> 00:07:07,680
rivers and the lakes this is when SWAT

157
00:07:12,529 --> 00:07:10,440
will be able to help us it will be able

158
00:07:15,290 --> 00:07:12,539
to help us understand the impact of

159
00:07:18,230 --> 00:07:15,300
those atmospheric rivers on the water

160
00:07:20,629 --> 00:07:18,240
level in rivers and lakes around the

161
00:07:22,490 --> 00:07:20,639
world everywhere and thanks to the

162
00:07:26,089 --> 00:07:22,500
technology that's on board so it's based

163
00:07:28,550 --> 00:07:26,099

on radar right so we're radar helps us

164
00:07:29,930 --> 00:07:28,560
see through clouds we can actually see

165
00:07:32,150 --> 00:07:29,940
through clouds so we can make

166
00:07:35,089 --> 00:07:32,160
measurements during the storm of course

167
00:07:36,650 --> 00:07:35,099
if the the platform is above the storm

168
00:07:38,689 --> 00:07:36,660
so it can be somewhere else in the world

169
00:07:41,150 --> 00:07:38,699
right so it doesn't cover the entire

170
00:07:44,390 --> 00:07:41,160
Earth instantaneously it goes around the

171
00:07:47,150 --> 00:07:44,400
earth so we can make measurements during

172
00:07:48,950 --> 00:07:47,160
the storm and even after if there's some

173
00:07:50,689 --> 00:07:48,960
clouds remaining we can still make

174
00:07:53,089 --> 00:07:50,699
measurements thanks to that radar

175
00:07:56,029 --> 00:07:53,099
technology we can make measurements of

176
00:07:58,730 --> 00:07:56,039
the impact of that atmospheric River on

177
00:08:00,710 --> 00:07:58,740
the water level in the rivers and the

178
00:08:03,230 --> 00:08:00,720
lakes so in

179
00:08:06,110 --> 00:08:03,240
with SWOT we can only see water level

180
00:08:09,710 --> 00:08:06,120
where where you have the rivers and the

181
00:08:10,969 --> 00:08:09,720
lakes but with nysar in 2024 which will

182
00:08:13,550 --> 00:08:10,979
be launched

183
00:08:15,830 --> 00:08:13,560
we can combine the data from SWAP and

184
00:08:20,390 --> 00:08:15,840
nisor to also look at the impact of

185
00:08:22,369 --> 00:08:20,400
flooding across uh the land and also

186
00:08:26,029 --> 00:08:22,379
better understand the impact of these

187
00:08:27,770 --> 00:08:26,039
atmospheric rivers on our landscapes

188
00:08:30,670 --> 00:08:27,780

takes a village even if it's a village

189
00:08:33,589 --> 00:08:30,680
of satellites right Mark yes

190
00:08:34,969 --> 00:08:33,599
now what's up sets SWAT apart also like

191
00:08:36,409 --> 00:08:34,979
you mentioned is the fact that you can

192
00:08:38,209 --> 00:08:36,419
see through clouds a lot of its

193
00:08:40,730 --> 00:08:38,219
predecessors wasn't able weren't able to

194
00:08:42,709 --> 00:08:40,740
do that before so that is a really great

195
00:08:44,029 --> 00:08:42,719
break in technology now is there

196
00:08:45,470 --> 00:08:44,039
anything in your background that

197
00:08:47,870 --> 00:08:45,480
uniquely has prepared you for this

198
00:08:49,790 --> 00:08:47,880
Mission I know you love to travel and

199
00:08:52,670 --> 00:08:49,800
that you've seen firsthand these effects

200
00:08:54,710 --> 00:08:52,680
of climate change on Deltas in Louisiana

201
00:08:57,769 --> 00:08:54,720
and across the world so tell us a little

202
00:09:00,470 --> 00:08:57,779
bit about that okay so uh I've been

203
00:09:03,650 --> 00:09:00,480
studying uh Mangrove ecosystems and

204
00:09:06,290 --> 00:09:03,660
marshes for the last few decades using

205
00:09:09,710 --> 00:09:06,300
radar interferometry so a technology

206
00:09:12,290 --> 00:09:09,720
very similar to that of SWAT I was

207
00:09:14,570 --> 00:09:12,300
looking at vegetation structure for

208
00:09:18,769 --> 00:09:14,580
example so the height of trees and how

209
00:09:21,889 --> 00:09:18,779
they grow so going around the world and

210
00:09:25,910 --> 00:09:21,899
understanding the interaction of these

211
00:09:28,430 --> 00:09:25,920
ecosystems with the hydrology is

212
00:09:31,970 --> 00:09:28,440
critical so it's really important to

213
00:09:32,829 --> 00:09:31,980

understand how these ecosystems work

214
00:09:36,889 --> 00:09:32,839
together

215
00:09:39,410 --> 00:09:36,899
with water and also with people so from

216
00:09:41,690 --> 00:09:39,420
my background in radar remote sensing

217
00:09:45,050 --> 00:09:41,700
and also my understanding and my

218
00:09:47,930 --> 00:09:45,060
experience in these Coastal ecosystems I

219
00:09:51,650 --> 00:09:47,940
really think that here with SWOT we're

220
00:09:55,310 --> 00:09:51,660
covering a missing link and I'm really

221
00:09:57,290 --> 00:09:55,320
hopeful on what SWAT can bring us on in

222
00:10:00,650 --> 00:09:57,300
helping our understanding of this

223
00:10:02,810 --> 00:10:00,660
ecosystem which are extremely dynamic

224
00:10:04,130 --> 00:10:02,820
wonderful thanks so much Mark now we've

225
00:10:05,990 --> 00:10:04,140
got a lot of questions over the last

226
00:10:08,329 --> 00:10:06,000
couple of weeks from different social

227
00:10:09,769 --> 00:10:08,339
media platforms and I think you will be

228
00:10:13,250 --> 00:10:09,779
able to answer a lot of them are you up

229
00:10:16,370 --> 00:10:13,260
for that I am all right our first

230
00:10:19,190 --> 00:10:16,380
question comes from clavi on Twitter and

231
00:10:21,410 --> 00:10:19,200
they ask how will SWOT data be shared

232
00:10:24,949 --> 00:10:21,420
with institutions and the general public

233
00:10:26,329 --> 00:10:24,959
okay so swap data first of all will be

234
00:10:29,570 --> 00:10:26,339
free to all

235
00:10:31,250 --> 00:10:29,580
starting in the fall of this year so

236
00:10:34,190 --> 00:10:31,260
whether you're a high school student

237
00:10:36,590 --> 00:10:34,200
working on a science fair uh grad

238
00:10:39,230 --> 00:10:36,600

student working in a thesis or a

239
00:10:42,650 --> 00:10:39,240
professional researcher engineer the

240
00:10:44,990 --> 00:10:42,660
data is all yours it's yours to use

241
00:10:46,910 --> 00:10:45,000
it's what we provide data everywhere in

242
00:10:49,370 --> 00:10:46,920
the world so

243
00:10:54,769 --> 00:10:49,380
whether you're interested in the Niger

244
00:10:57,949 --> 00:10:54,779
Delta in Bangladesh the Everglades the

245
00:11:02,210 --> 00:10:57,959
Amazon River or even Coastal New York

246
00:11:05,630 --> 00:11:02,220
the data is there for you to use and for

247
00:11:08,509 --> 00:11:05,640
us it's not only to make sure that you

248
00:11:10,250 --> 00:11:08,519
can use the data we we really want you

249
00:11:13,190 --> 00:11:10,260
to use the data we want to make

250
00:11:16,310 --> 00:11:13,200
something that is useful all the data

251
00:11:20,030 --> 00:11:16,320
that's collected by SWOT and other NASA

252
00:11:22,610 --> 00:11:20,040
satellites are free and available to all

253
00:11:23,810 --> 00:11:22,620
and that's what's so incredible I hope

254
00:11:25,190 --> 00:11:23,820
everyone is going to really take

255
00:11:27,290 --> 00:11:25,200
advantage of that Mark and if you're

256
00:11:30,050 --> 00:11:27,300
just joining us we're here with senior

257
00:11:32,329 --> 00:11:30,060
scientist Mark Simard at NASA's jet

258
00:11:35,569 --> 00:11:32,339
propulsion laboratory talking about the

259
00:11:37,490 --> 00:11:35,579
latest launched Earth Mission SWAT which

260
00:11:39,350 --> 00:11:37,500
will be tracking the Earth's water so

261
00:11:41,569 --> 00:11:39,360
going on to our next social media

262
00:11:44,150 --> 00:11:41,579
question comes from shikar on YouTube

263
00:11:46,550 --> 00:11:44,160

what exactly is the swap Mission doing

264
00:11:48,710 --> 00:11:46,560
for Earth and how will it help us better

265
00:11:51,769 --> 00:11:48,720
understand climate change

266
00:11:54,110 --> 00:11:51,779
okay so climate change uh you may you

267
00:11:56,389 --> 00:11:54,120
may have heard of the carbon cycle so

268
00:11:59,990 --> 00:11:56,399
the carbon when it's in the atmosphere

269
00:12:02,509 --> 00:12:00,000
is a greenhouse gas it can be stored in

270
00:12:05,690 --> 00:12:02,519
forests or the ocean

271
00:12:08,150 --> 00:12:05,700
so there's a missing link here in our

272
00:12:11,269 --> 00:12:08,160
understanding of that carbon cycle and I

273
00:12:14,750 --> 00:12:11,279
believe this missing link is not between

274
00:12:16,790 --> 00:12:14,760
uh we know about the link between the

275
00:12:18,949 --> 00:12:16,800
ocean and the atmosphere and the

276
00:12:20,870 --> 00:12:18,959
atmosphere and the forest we still you

277
00:12:22,850 --> 00:12:20,880
know it's a super accurate but we're

278
00:12:25,850 --> 00:12:22,860
working on it but the big missing link

279
00:12:29,569 --> 00:12:25,860
to my point of view is the transport of

280
00:12:33,230 --> 00:12:29,579
carbon from the land to the ocean and

281
00:12:36,170 --> 00:12:33,240
that transport is Through Rivers and

282
00:12:39,829 --> 00:12:36,180
estuaries and river deltas and this is

283
00:12:42,650 --> 00:12:39,839
SWAT this is where SWAT can really help

284
00:12:45,949 --> 00:12:42,660
us since SWOT will give us estimates of

285
00:12:48,829 --> 00:12:45,959
the flux of water from land to Sea

286
00:12:51,110 --> 00:12:48,839
and if we know what's how much carbon

287
00:12:54,170 --> 00:12:51,120
there is in that water we can also know

288
00:12:56,150 --> 00:12:54,180

about the export of carbon from the land

289
00:12:58,790 --> 00:12:56,160
to the Sea and that I think this is

290
00:13:01,610 --> 00:12:58,800
where the the big breakthrough will be

291
00:13:03,769 --> 00:13:01,620
in terms of climate change understanding

292
00:13:06,829 --> 00:13:03,779
climate change but

293
00:13:10,670 --> 00:13:06,839
I think in my opinion the the big thing

294
00:13:14,629 --> 00:13:10,680
for SWOT will mainly be about the impact

295
00:13:17,090 --> 00:13:14,639
of climate change so we do have a

296
00:13:19,250 --> 00:13:17,100
shifting precipitation patterns around

297
00:13:22,670 --> 00:13:19,260
the globe we're seeing that in

298
00:13:25,910 --> 00:13:22,680
California right now so sometimes we'll

299
00:13:28,730 --> 00:13:25,920
have places where we used to have water

300
00:13:30,650 --> 00:13:28,740
a lot of rain maybe there won't be so

301
00:13:32,269 --> 00:13:30,660
much rain in the future some other

302
00:13:34,389 --> 00:13:32,279
places where they didn't have much rain

303
00:13:36,889 --> 00:13:34,399
will have more rain

304
00:13:40,129 --> 00:13:36,899
there's a big shift in these

305
00:13:43,009 --> 00:13:40,139
precipitation patterns and SWOT will

306
00:13:45,650 --> 00:13:43,019
really help us measure what's happening

307
00:13:49,490 --> 00:13:45,660
with that shift what the impact of that

308
00:13:52,790 --> 00:13:49,500
shift is on the transport of water

309
00:13:55,550 --> 00:13:52,800
across the land and because of the

310
00:13:58,009 --> 00:13:55,560
measurements that it will provide on

311
00:14:00,530 --> 00:13:58,019
these shifting patterns and also on the

312
00:14:03,470 --> 00:14:00,540
current ones it will help us calibrate

313
00:14:07,009 --> 00:14:03,480

hydrodynamic hydrological models for the

314
00:14:08,389 --> 00:14:07,019
surface so once we have these accurate

315
00:14:11,030 --> 00:14:08,399
models because they'll be accurate

316
00:14:12,829 --> 00:14:11,040
because now we have something watching

317
00:14:15,350 --> 00:14:12,839
over us to make sure that these models

318
00:14:17,810 --> 00:14:15,360
are good we can use these models to

319
00:14:20,750 --> 00:14:17,820
forecast where water will be transported

320
00:14:22,250 --> 00:14:20,760
and where it will not be transported and

321
00:14:25,430 --> 00:14:22,260
how much of that water is being

322
00:14:28,190 --> 00:14:25,440
transported so I think it's about the

323
00:14:29,629 --> 00:14:28,200
impact right and in a lot of cases we

324
00:14:32,150 --> 00:14:29,639
haven't had that information before

325
00:14:34,250 --> 00:14:32,160
especially globally and so that's really

326
00:14:37,730 --> 00:14:34,260
what sets SWAT apart

327
00:14:39,470 --> 00:14:37,740
yes all right on to the next question a

328
00:14:41,449 --> 00:14:39,480
great one from social and I know you

329
00:14:43,910 --> 00:14:41,459
have a lot to do with this so is there a

330
00:14:46,129 --> 00:14:43,920
process that goes into validating and

331
00:14:49,850 --> 00:14:46,139
confirming the data before it is

332
00:14:52,310 --> 00:14:49,860
released publicly yes uh definitely so

333
00:14:53,689 --> 00:14:52,320
we have several teams within the

334
00:14:56,030 --> 00:14:53,699
Schwartz science team and the swap

335
00:14:58,129 --> 00:14:56,040
project going around the world across

336
00:14:59,509 --> 00:14:58,139
North America making Institute

337
00:15:02,150 --> 00:14:59,519
measurements so we're basically

338
00:15:04,550 --> 00:15:02,160

installing water level gauges in several

339
00:15:07,430 --> 00:15:04,560
places around the world some of those

340
00:15:10,069 --> 00:15:07,440
places will also be collecting light

341
00:15:12,110 --> 00:15:10,079
door measurements from aircrafts and air

342
00:15:14,990 --> 00:15:12,120
swap measurement air SWOT is a an

343
00:15:16,670 --> 00:15:15,000
instrument that simulates uh SWOT but

344
00:15:19,569 --> 00:15:16,680
it's on an aircraft and we know it

345
00:15:25,189 --> 00:15:19,579
worked so we can check and make sure

346
00:15:28,069 --> 00:15:25,199
that swap data is accurate and that it

347
00:15:30,889 --> 00:15:28,079
can be distributed with great accuracy

348
00:15:33,350 --> 00:15:30,899
so we have several campaigns going on my

349
00:15:36,650 --> 00:15:33,360
team we're going into three different

350
00:15:40,009 --> 00:15:36,660
regions uh and we're focusing on

351
00:15:42,290 --> 00:15:40,019
estuaries so during the calval the

352
00:15:46,569 --> 00:15:42,300
calibration and validation phase of SWOT

353
00:15:49,250 --> 00:15:46,579
which is from March to June SWOT will be

354
00:15:51,829 --> 00:15:49,260
overpassing just several areas around

355
00:15:55,009 --> 00:15:51,839
the world very few estuaries and Deltas

356
00:15:56,990 --> 00:15:55,019
so we picked three we picked the guaya

357
00:16:00,590 --> 00:15:57,000
century in Ecuador where we'll be

358
00:16:02,870 --> 00:16:00,600
installing a dozen of water level gauges

359
00:16:05,410 --> 00:16:02,880
just to make sure again that SWOT is

360
00:16:07,689 --> 00:16:05,420
making actual and accurate measurement

361
00:16:11,930 --> 00:16:07,699
we're also being

362
00:16:14,569 --> 00:16:11,940
deployed to Gabon in the Como Estuary so

363
00:16:17,870 --> 00:16:14,579

again there will be placing a few water

364
00:16:21,710 --> 00:16:17,880
level gauges around to compare with SWAT

365
00:16:24,430 --> 00:16:21,720
and then in April May we'll be going to

366
00:16:27,949 --> 00:16:24,440
the Saint Lawrence River to install

367
00:16:29,269 --> 00:16:27,959
gauges but we the experiment there is a

368
00:16:32,629 --> 00:16:29,279
lot more

369
00:16:34,910 --> 00:16:32,639
intense let's say we have light doors

370
00:16:37,730 --> 00:16:34,920
flying so aircraft with laser

371
00:16:40,910 --> 00:16:37,740
antimatter's and we also have what I

372
00:16:45,290 --> 00:16:40,920
mentioned before the air SWOT which is a

373
00:16:46,910 --> 00:16:45,300
radar interferometer just like SWOT but

374
00:16:49,430 --> 00:16:46,920
install an aircraft and we know it

375
00:16:51,410 --> 00:16:49,440
worked because we used it in the

376
00:16:55,629 --> 00:16:51,420
Mississippi River delta for a Delta X

377
00:16:59,749 --> 00:16:55,639
experiment that occurred in 2020 so

378
00:17:02,870 --> 00:16:59,759
2021. so uh we'll be deploying these

379
00:17:05,090 --> 00:17:02,880
instruments everywhere making sure that

380
00:17:07,610 --> 00:17:05,100
SWOT is giving you and providing you

381
00:17:09,890 --> 00:17:07,620
accurate measurements so think of it as

382
00:17:11,870 --> 00:17:09,900
quality control

383
00:17:13,850 --> 00:17:11,880
that's right so you guys are going all

384
00:17:16,010 --> 00:17:13,860
over the world many different groups of

385
00:17:18,049 --> 00:17:16,020
you to make sure that you're validating

386
00:17:19,490 --> 00:17:18,059
all the SWAT data that's coming down to

387
00:17:20,750 --> 00:17:19,500
make sure that it's accurate and one of

388
00:17:23,809 --> 00:17:20,760

those places you're going to is near

389
00:17:25,429 --> 00:17:23,819
your hometown yes indeed it's pretty

390
00:17:28,069 --> 00:17:25,439
fortunate I'm pretty happy about that

391
00:17:30,770 --> 00:17:28,079
that's fun and tell us about where

392
00:17:34,610 --> 00:17:30,780
you're from yeah so I'm from a town

393
00:17:36,950 --> 00:17:34,620
called arvida which is uh two hours

394
00:17:39,710 --> 00:17:36,960
north of Quebec City along a river

395
00:17:42,470 --> 00:17:39,720
called sagni that's sagne is actually an

396
00:17:44,470 --> 00:17:42,480
estuary that throws itself into the

397
00:17:47,450 --> 00:17:44,480
Saint Lawrence Estuary

398
00:17:49,850 --> 00:17:47,460
so SWAT will be covering during its

399
00:17:52,010 --> 00:17:49,860
calibration and validation phase those

400
00:17:55,850 --> 00:17:52,020
two estuaries so the the Saint Lawrence

401
00:17:57,850 --> 00:17:55,860
fishery and the sagini Estuary so it

402
00:18:00,890 --> 00:17:57,860
would be a pleasure to be there and

403
00:18:02,750 --> 00:18:00,900
finally understand things that are close

404
00:18:04,190 --> 00:18:02,760
to home which I still don't really

405
00:18:06,230 --> 00:18:04,200
understand

406
00:18:08,210 --> 00:18:06,240
and hopefully in that area you won't

407
00:18:11,029 --> 00:18:08,220
encounter what we did in Louisiana Mark

408
00:18:13,330 --> 00:18:11,039
I'll never forget the mom alligator near

409
00:18:18,730 --> 00:18:13,340
that river gauge for sure

410
00:18:23,390 --> 00:18:21,529
the water is just very cold so I don't

411
00:18:24,230 --> 00:18:23,400
think we'll be encountering anything in

412
00:18:27,770 --> 00:18:24,240
the water

413
00:18:28,970 --> 00:18:27,780

just in Louisiana and and a point I

414
00:18:31,190 --> 00:18:28,980
wanted to make sure people understand

415
00:18:33,470 --> 00:18:31,200
that are joining us today is is the

416
00:18:36,169 --> 00:18:33,480
wetlands are such a sacred and really

417
00:18:38,029 --> 00:18:36,179
beautiful place and and the conservation

418
00:18:41,150 --> 00:18:38,039
and protection that you're doing in

419
00:18:43,010 --> 00:18:41,160
Louisiana has shown improvements so I I

420
00:18:45,350 --> 00:18:43,020
really wanted to show folks that there

421
00:18:46,970 --> 00:18:45,360
is a positivity that's coming out of the

422
00:18:48,590 --> 00:18:46,980
the preservation and the steps you're

423
00:18:50,570 --> 00:18:48,600
taking to make sure that that they're

424
00:18:52,730 --> 00:18:50,580
here for many generations to come yeah

425
00:18:55,549 --> 00:18:52,740
indeed so I mentioned earlier the

426
00:18:57,830 --> 00:18:55,559
landsat archive so there's we see a lot

427
00:18:59,750 --> 00:18:57,840
of land loss around the world including

428
00:19:02,270 --> 00:18:59,760
in the Mississippi River delta but we

429
00:19:04,970 --> 00:19:02,280
also witnessed using these uh these

430
00:19:07,909 --> 00:19:04,980
Archives of data some places where we're

431
00:19:10,909 --> 00:19:07,919
gaining land so if you think if you look

432
00:19:12,650 --> 00:19:10,919
at the hfaleria Basin which includes you

433
00:19:15,770 --> 00:19:12,660
know it's a basis it's a coastal Basin

434
00:19:20,330 --> 00:19:15,780
where the hfalaya river and the wax Lake

435
00:19:22,669 --> 00:19:20,340
Outlet go into the Gulf of Mexico this

436
00:19:24,950 --> 00:19:22,679
place is actually building land we're

437
00:19:26,750 --> 00:19:24,960
talking about all the impact of climate

438
00:19:28,730 --> 00:19:26,760

change and people and so on but some

439
00:19:33,650 --> 00:19:28,740
areas are building in so there is hope

440
00:19:37,490 --> 00:19:33,660
so if we understand how nature can build

441
00:19:40,310 --> 00:19:37,500
resilience to climate change and we can

442
00:19:42,890 --> 00:19:40,320
maybe try to replicate that in other

443
00:19:45,409 --> 00:19:42,900
places around the world so with this

444
00:19:48,470 --> 00:19:45,419
Delta X Mission which is Airborne which

445
00:19:50,270 --> 00:19:48,480
I mentioned we're trying to do that but

446
00:19:51,830 --> 00:19:50,280
for the Mississippi River delta you know

447
00:19:55,370 --> 00:19:51,840
we cannot send airplanes everywhere in

448
00:19:58,190 --> 00:19:55,380
the world so SWAT will do that for us so

449
00:20:01,130 --> 00:19:58,200
we'll be able to do what we're trying to

450
00:20:03,950 --> 00:20:01,140
do in the Mississippi River delta using

451
00:20:05,690 --> 00:20:03,960
and swap to other places so we can go

452
00:20:08,210 --> 00:20:05,700
around the world trying to better

453
00:20:10,730 --> 00:20:08,220
understand the interaction and how we

454
00:20:12,950 --> 00:20:10,740
can build deltas from

455
00:20:15,470 --> 00:20:12,960
base from

456
00:20:17,990 --> 00:20:15,480
and then boots on the ground on land

457
00:20:22,549 --> 00:20:18,000
indeed

458
00:20:27,470 --> 00:20:25,010
and this isn't in

459
00:20:29,210 --> 00:20:27,480
what so are there any closing remarks

460
00:20:30,409 --> 00:20:29,220
that you might want to say in each of

461
00:20:34,430 --> 00:20:30,419
those languages

462
00:20:36,730 --> 00:20:34,440
so I I would say 4.2 languages my

463
00:20:40,250 --> 00:20:36,740

Portuguese is more like Portugal

464
00:20:42,049 --> 00:20:40,260
so uh okay so just maybe uh just

465
00:20:51,890 --> 00:20:42,059
summarize

466
00:20:51,900 --> 00:21:01,150
electricity

467
00:21:14,590 --> 00:21:02,750
uh

468
00:21:23,169 --> 00:21:17,029
a and now what's like where's that okay

469
00:21:59,840 --> 00:21:40,870
is

470
00:22:04,870 --> 00:22:01,909
[Music]

471
00:22:07,490 --> 00:22:04,880
so yeah that's it that's my Portuguese

472
00:22:09,230 --> 00:22:07,500
wonderful wonderful and I'll add a

473
00:22:15,430 --> 00:22:09,240
little bit of Croatian here to the mix

474
00:22:21,529 --> 00:22:19,010
we all need water on our planet Earth so

475
00:22:24,169 --> 00:22:21,539
thank you so much for joining us here

476
00:22:25,909 --> 00:22:24,179
today Mark we learned so much and it was

477
00:22:27,710 --> 00:22:25,919
a real pleasure talking with you all

478
00:22:30,470 --> 00:22:27,720
right thank you very much

479
00:22:32,570 --> 00:22:30,480
see you bye everyone

480
00:22:34,549 --> 00:22:32,580
and thank you so much to all of our

481
00:22:35,810 --> 00:22:34,559
viewers for joining us today now if you

482
00:22:38,750 --> 00:22:35,820
want to learn a little bit more about

483
00:22:40,850 --> 00:22:38,760
the SWAT Mission you can join us and

484
00:22:42,710 --> 00:22:40,860
follow us on our two social channels

485
00:22:47,330 --> 00:22:42,720
that were featured here today at NASA

486
00:22:49,310 --> 00:22:47,340
JPL and at Nasa climate change and two

487
00:22:51,470 --> 00:22:49,320
weeks from today get excited we're going

488
00:22:54,350 --> 00:22:51,480

to be talking to one of swat's Engineers

489
00:22:57,110 --> 00:22:54,360
Christine Jabara and we're going to go

490
00:23:00,169 --> 00:22:57,120
into more depth about what sets SWAT

491
00:23:02,710 --> 00:23:00,179
apart on the engineering aspect and

492
00:23:06,590 --> 00:23:02,720
always remember at Nasa earth science