



TRACKING WORLD WATER, PROTECTING COMMUNITIES



Jet Propulsion Laboratory
California Institute of Technology

1
00:00:04,370 --> 00:00:02,050

[Music]

2
00:00:05,990 --> 00:00:04,380

SWAT is the surface water and ocean

3
00:00:07,490 --> 00:00:06,000

topography satellite it's an

4
00:00:08,690 --> 00:00:07,500

International satellite that's going to

5
00:00:10,430 --> 00:00:08,700

give us this complete view of the

6
00:00:12,410 --> 00:00:10,440

surface water here on Earth what's

7
00:00:14,509 --> 00:00:12,420

happening the Lakes reservoirs rivers

8
00:00:16,430 --> 00:00:14,519

and also in the ocean it'll tell us

9
00:00:18,590 --> 00:00:16,440

about how sea level is rising along

10
00:00:20,029 --> 00:00:18,600

coastlines and in the open ocean and

11
00:00:21,830 --> 00:00:20,039

really give us a good understanding of

12
00:00:23,410 --> 00:00:21,840

how surface water is moving about the

13
00:00:28,570 --> 00:00:23,420

Earth

14

00:00:32,450 --> 00:00:28,580

[Music]

15

00:00:34,610 --> 00:00:32,460

our goal is to provide data forecasts

16

00:00:36,889 --> 00:00:34,620

watches and warnings at some key

17

00:00:39,590 --> 00:00:36,899

locations like the Willamette River in

18

00:00:41,569 --> 00:00:39,600

Portland which is a major U.S city that

19

00:00:42,590 --> 00:00:41,579

historically has seen some catastrophic

20

00:00:45,830 --> 00:00:42,600

floods

21

00:00:48,950 --> 00:00:45,840

the better quality of the data that we

22

00:00:51,049 --> 00:00:48,960

have that feeds into our models the

23

00:00:52,610 --> 00:00:51,059

better the forecasts are going to be the

24

00:00:54,170 --> 00:00:52,620

more time that people will have to

25

00:00:56,869 --> 00:00:54,180

protect themselves and their property

26
00:00:59,209 --> 00:00:56,879
and ultimately our communities a tool

27
00:01:00,610 --> 00:00:59,219
like SWAT is going to help us with

28
00:01:02,689 --> 00:01:00,620
making these really difficult

29
00:01:03,370 --> 00:01:02,699
projections and predictions for the

30
00:01:07,789 --> 00:01:03,380
future

31
00:01:10,010 --> 00:01:07,799
[Music]

32
00:01:12,170 --> 00:01:10,020
we're in the Willamette Valley in Oregon

33
00:01:13,789 --> 00:01:12,180
it is a human-made lake it is a

34
00:01:16,250 --> 00:01:13,799
reservoir operated by the Army Corps of

35
00:01:18,230 --> 00:01:16,260
Engineers the water managers here they

36
00:01:20,510 --> 00:01:18,240
use you know weather prediction they use

37
00:01:21,950 --> 00:01:20,520
hydrologic models and the hope is that

38
00:01:23,749 --> 00:01:21,960

data like SWAT might be incorporated

39

00:01:25,550 --> 00:01:23,759

into those predictions to help them

40

00:01:26,749 --> 00:01:25,560

better understand this water body's

41

00:01:28,370 --> 00:01:26,759

filling and we don't want to over top

42

00:01:30,109 --> 00:01:28,380

the dams you might want to start letting

43

00:01:32,870 --> 00:01:30,119

water out really quickly they have to

44

00:01:34,969 --> 00:01:32,880

make a lot of complicated decisions

45

00:01:36,649 --> 00:01:34,979

when you get a big storm event we want

46

00:01:39,230 --> 00:01:36,659

to keep the communities safe in the best

47

00:01:41,210 --> 00:01:39,240

way that we can so how do we best manage

48

00:01:42,830 --> 00:01:41,220

operation of these reservoirs in terms

49

00:01:45,170 --> 00:01:42,840

of putting water out Downstream to

50

00:01:47,030 --> 00:01:45,180

prevent flooding at a larger scale

51
00:01:49,249 --> 00:01:47,040
in lots of states there are you know

52
00:01:51,050 --> 00:01:49,259
hundreds thousands of reservoirs and

53
00:01:53,270 --> 00:01:51,060
many of those reservoirs don't have

54
00:01:55,069 --> 00:01:53,280
automated gauging available and so these

55
00:01:56,270 --> 00:01:55,079
agencies have to kind of estimate how

56
00:01:58,429 --> 00:01:56,280
much water is in them and how that's

57
00:02:00,300 --> 00:01:58,439
changing and with SWAT they can just

58
00:02:03,289 --> 00:02:00,310
monitor that directly from space

59
00:02:06,170 --> 00:02:03,299
[Music]

60
00:02:09,169 --> 00:02:06,180
for us in Alaska we have many many

61
00:02:16,869 --> 00:02:09,179
rivers and only a few of them are

62
00:02:21,770 --> 00:02:19,970
if we have data on when flooding is

63
00:02:23,390 --> 00:02:21,780

occurring or might occur we can get

64

00:02:24,770 --> 00:02:23,400

crews out there to look at the bridge to

65

00:02:27,350 --> 00:02:24,780

make sure that the bridge and the

66

00:02:29,809 --> 00:02:27,360

associated roadway are still safe if we

67

00:02:32,030 --> 00:02:29,819

can start collecting data on All Rivers

68

00:02:34,550 --> 00:02:32,040

above a certain size remotely from

69

00:02:36,250 --> 00:02:34,560

satellites it really opens up the amount

70

00:02:38,990 --> 00:02:36,260

of rivers that we can help understand

71

00:02:41,990 --> 00:02:39,000

what happens when they flood or how they

72

00:02:44,449 --> 00:02:42,000

flood and that really improves our

73

00:02:47,330 --> 00:02:44,459

ability to manage our infrastructure and

74

00:02:48,710 --> 00:02:47,340

to design new infrastructure that is

75

00:02:50,270 --> 00:02:48,720

where SWAT will really make a big

76

00:02:51,890 --> 00:02:50,280

difference

77

00:02:53,210 --> 00:02:51,900

one of the partners we're working with

78

00:02:55,070 --> 00:02:53,220

is the Department of Defense and they're

79

00:03:01,009 --> 00:02:55,080

trying to fill gaps in the data that

80

00:03:04,430 --> 00:03:02,930

our military is obviously very concerned

81

00:03:05,809 --> 00:03:04,440

about what's happening on global scales

82

00:03:08,089 --> 00:03:05,819

and they have installations across the

83

00:03:09,650 --> 00:03:08,099

globe so SWAT will potentially provide

84

00:03:11,509 --> 00:03:09,660

an opportunity to fill in some of those

85

00:03:13,130 --> 00:03:11,519

gaps allow them to make the impact

86

00:03:14,869 --> 00:03:13,140

assessments that they need for sea level

87

00:03:16,250 --> 00:03:14,879

rise in their facilities so trying to

88

00:03:17,990 --> 00:03:16,260

understand and give them the information

89

00:03:19,550 --> 00:03:18,000

they need to plan for and then

90

00:03:22,330 --> 00:03:19,560

potentially adapt to these changes is

91

00:03:24,470 --> 00:03:22,340

really critically important

92

00:03:26,809 --> 00:03:24,480

coastal wetlands like the Mississippi

93

00:03:29,270 --> 00:03:26,819

River delta are extremely important

94

00:03:36,610 --> 00:03:29,280

because it acts as a buffer between us

95

00:03:41,690 --> 00:03:39,470

with SWAT because of its high spatial

96

00:03:44,210 --> 00:03:41,700

resolution will be able to resolve water

97

00:03:46,670 --> 00:03:44,220

surface elevation right at the coast

98

00:03:48,949 --> 00:03:46,680

so this is quite important because as

99

00:03:51,589 --> 00:03:48,959

sea level rises the ocean will migrate

100

00:03:53,149 --> 00:03:51,599

into the land bringing more salt into

101

00:03:55,309 --> 00:03:53,159

the land so it threatens the

102

00:03:57,649 --> 00:03:55,319

infrastructure the biodiversity in the

103

00:03:59,750 --> 00:03:57,659

wetlands along the coast hopefully the

104

00:04:01,970 --> 00:03:59,760

types of models that we're producing can

105

00:04:04,550 --> 00:04:01,980

support how they decide to manage the

106

00:04:07,369 --> 00:04:04,560

River delta and SWOT on its own will

107

00:04:10,729 --> 00:04:07,379

allow us to upscale these types of

108

00:04:12,589 --> 00:04:10,739

studies to the world I'm really excited

109

00:04:14,210 --> 00:04:12,599

about the new information we'll get from

110

00:04:15,890 --> 00:04:14,220

SWAT and how we can start to couple it

111

00:04:17,750 --> 00:04:15,900

to some of the the needs that we see

112

00:04:19,370 --> 00:04:17,760

both at the coastal interface and also

113

00:04:20,990 --> 00:04:19,380

on land I think we can potentially see