



1
00:00:03,110 --> 00:00:01,670
aries model

2
00:00:04,710 --> 00:00:03,120
well victor thanks so much for showing

3
00:00:06,070 --> 00:00:04,720
us a little bit of nasa's history and

4
00:00:09,270 --> 00:00:06,080
showing us how important it is and as a

5
00:00:10,790 --> 00:00:09,280
future as well and you're welcome

6
00:00:12,230 --> 00:00:10,800
i'm here with dan irwin in the severe

7
00:00:14,150 --> 00:00:12,240
lab at the national space science and

8
00:00:16,390 --> 00:00:14,160
technology center and dan tell me

9
00:00:18,230 --> 00:00:16,400
exactly what severe stands for severe

10
00:00:20,550 --> 00:00:18,240
stands for regional monitoring and

11
00:00:22,870 --> 00:00:20,560
visualization system in spanish it's a

12
00:00:25,029 --> 00:00:22,880
spanish word also that means to serve

13
00:00:27,349 --> 00:00:25,039

and what we basically do here is we tap

14

00:00:29,189 --> 00:00:27,359

into the constellation of nasa

15

00:00:31,830 --> 00:00:29,199

satellites and bring together

16

00:00:33,430 --> 00:00:31,840

information for environmental management

17

00:00:35,590 --> 00:00:33,440

disaster response for the seven

18

00:00:38,470 --> 00:00:35,600

countries of central america what you're

19

00:00:40,869 --> 00:00:38,480

actually standing in is a development

20

00:00:42,790 --> 00:00:40,879

and rapid prototyping facility where we

21

00:00:45,430 --> 00:00:42,800

look at all the different nasa research

22

00:00:48,229 --> 00:00:45,440

that's occurring bring it together here

23

00:00:50,549 --> 00:00:48,239

test it out and then what works for say

24

00:00:52,229 --> 00:00:50,559

oceans or forest

25

00:00:54,069 --> 00:00:52,239

deforestation

26

00:00:55,590 --> 00:00:54,079

for harmful algae blooms that are

27

00:00:57,189 --> 00:00:55,600

occurring in the oceans we look at these

28

00:00:58,950 --> 00:00:57,199

technologies and then we actually

29

00:01:01,189 --> 00:00:58,960

transport them and transfer them to an

30

00:01:04,310 --> 00:01:01,199

operational facility in the country of

31

00:01:05,830 --> 00:01:04,320

panama so this is a unique facility and

32

00:01:07,910 --> 00:01:05,840

all of these countries really tap into

33

00:01:09,190 --> 00:01:07,920

nasa's resources right precisely

34

00:01:11,350 --> 00:01:09,200

actually it's a two-way street what

35

00:01:13,830 --> 00:01:11,360

we're doing is providing the eyes in the

36

00:01:17,030 --> 00:01:13,840

sky where we can monitor what's going on

37

00:01:18,550 --> 00:01:17,040

daily weekly monthly and annually to see

38

00:01:20,469 --> 00:01:18,560

what's going on with their forests and

39

00:01:22,310 --> 00:01:20,479

their environment if there's a disaster

40

00:01:23,910 --> 00:01:22,320

that occurs we can provide near

41

00:01:26,550 --> 00:01:23,920

real-time information about that

42

00:01:28,469 --> 00:01:26,560

disaster and then send it down to these

43

00:01:30,230 --> 00:01:28,479

central american countries and in

44

00:01:32,149 --> 00:01:30,240

exchange they're collecting information

45

00:01:34,469 --> 00:01:32,159

in the field of what's going on and we

46

00:01:36,149 --> 00:01:34,479

bring those two data sets together and

47

00:01:38,230 --> 00:01:36,159

we use it for the best environmental

48

00:01:39,190 --> 00:01:38,240

management system perhaps in the world

49

00:01:41,670 --> 00:01:39,200

tell me about the future of this

50

00:01:43,350 --> 00:01:41,680

facility well the again this is a rapid

51
00:01:45,510 --> 00:01:43,360
prototyping and development facility

52
00:01:49,030 --> 00:01:45,520
what we have done is created a model and

53
00:01:51,510 --> 00:01:49,040
it's functioning in central america

54
00:01:53,830 --> 00:01:51,520
there is a global effort going on called

55
00:01:56,950 --> 00:01:53,840
geos the global earth observation system

56
00:01:58,950 --> 00:01:56,960
of systems and that's basically a an

57
00:02:01,510 --> 00:01:58,960
effort of over 70 countries to create

58
00:02:04,310 --> 00:02:01,520
this 21st century observation system

59
00:02:06,630 --> 00:02:04,320
around the globe what servier is in fact

60
00:02:08,309 --> 00:02:06,640
it's been recognized as a template for

61
00:02:10,949 --> 00:02:08,319
expansion to other locations around the

62
00:02:12,710 --> 00:02:10,959
globe such as africa and south america

63
00:02:15,190 --> 00:02:12,720

and currently we're expanding to to the

64

00:02:17,270 --> 00:02:15,200

caribbean and um specifically the

65

00:02:18,869 --> 00:02:17,280

dominican republic well a lot a lot of

66

00:02:20,070 --> 00:02:18,879

ground to cover there but it's not just

67

00:02:21,670 --> 00:02:20,080

about weather either it's about

68

00:02:23,350 --> 00:02:21,680

archaeology you actually have an

69

00:02:25,670 --> 00:02:23,360

archaeologist on staff here right sure

70

00:02:27,990 --> 00:02:25,680

in fact the principal investigator of

71

00:02:29,670 --> 00:02:28,000

severe is tom seaver who's nasa's only

72

00:02:30,949 --> 00:02:29,680

archaeologist all right i think bill is

73

00:02:32,550 --> 00:02:30,959

with him now

74

00:02:33,589 --> 00:02:32,560

we're here in tom seaver's office which

75

00:02:35,270 --> 00:02:33,599

is right around the corner from the

76

00:02:37,190 --> 00:02:35,280

severe labs and as you mentioned he is

77

00:02:38,550 --> 00:02:37,200

the principal investigator for severe

78

00:02:40,309 --> 00:02:38,560

you've been here from the beginning so

79

00:02:43,270 --> 00:02:40,319

tell us how severe got started

80

00:02:45,910 --> 00:02:43,280

it started in 1987 when nasa and the

81

00:02:47,990 --> 00:02:45,920

national geographic society did an

82

00:02:49,830 --> 00:02:48,000

archaeological salvage project along the

83

00:02:53,270 --> 00:02:49,840

use of the center river which is the

84

00:02:55,750 --> 00:02:53,280

river that borders mexico and guatemala

85

00:02:57,350 --> 00:02:55,760

what you're showing is now a photo of an

86

00:02:59,509 --> 00:02:57,360

area that's it's very dramatic you can

87

00:03:00,869 --> 00:02:59,519

see this this deforested area and then

88

00:03:02,229 --> 00:03:00,879

where the rain forest seems to pick back

89

00:03:03,990 --> 00:03:02,239

up again what are we looking at here

90

00:03:06,869 --> 00:03:04,000

we're looking at a political border from

91

00:03:09,350 --> 00:03:06,879

space we can see the guatemala forest

92

00:03:13,030 --> 00:03:09,360

that is still intact and we can see the

93

00:03:15,350 --> 00:03:13,040

deforested tilled landscape of mexico

94

00:03:17,270 --> 00:03:15,360

so what happened here is that this

95

00:03:20,470 --> 00:03:17,280

archaeological project immediately

96

00:03:22,470 --> 00:03:20,480

changed to an environmental project

97

00:03:25,270 --> 00:03:22,480

because from space you could see this

98

00:03:28,309 --> 00:03:25,280

tilled landscape in contrast to the

99

00:03:30,070 --> 00:03:28,319

perfect forest of of guatemala and this

100

00:03:33,509 --> 00:03:30,080

caused the presidents of mexico and

101
00:03:36,949 --> 00:03:33,519
guatemala to end 150 years of tension

102
00:03:38,789 --> 00:03:36,959
along their border which led to

103
00:03:41,430 --> 00:03:38,799
the other ministers and presidents of

104
00:03:43,750 --> 00:03:41,440
central america uniting to work together

105
00:03:46,390 --> 00:03:43,760
for the preservation and monitoring of

106
00:03:48,550 --> 00:03:46,400
the region so dan tends to focus on the

107
00:03:51,110 --> 00:03:48,560
the weather changes in central america

108
00:03:53,030 --> 00:03:51,120
and how it affects the area you focus on

109
00:03:55,430 --> 00:03:53,040
what mankind has done to the area not

110
00:03:56,789 --> 00:03:55,440
just now but also in the ancient world

111
00:03:59,270 --> 00:03:56,799
tell us a little bit about your mind

112
00:04:01,589 --> 00:03:59,280
project well this area of guatemala was

113
00:04:03,750 --> 00:04:01,599

the center of the maya empire which had

114

00:04:06,070 --> 00:04:03,760

one of the greatest population densities

115

00:04:08,789 --> 00:04:06,080

in human history equivalent to the most

116

00:04:10,229 --> 00:04:08,799

densely populated areas of china and

117

00:04:12,309 --> 00:04:10,239

java today

118

00:04:14,070 --> 00:04:12,319

around 800 ads something dramatic

119

00:04:16,310 --> 00:04:14,080

happened and we don't know what there

120

00:04:18,229 --> 00:04:16,320

have been over a hundred explanation but

121

00:04:20,310 --> 00:04:18,239

we do know that the maya disappeared

122

00:04:22,230 --> 00:04:20,320

from this region and from space you're

123

00:04:25,110 --> 00:04:22,240

able to track though where some of these

124

00:04:26,710 --> 00:04:25,120

lost cities are now right this area is

125

00:04:28,870 --> 00:04:26,720

not conducive for traditional

126
00:04:30,790 --> 00:04:28,880
archaeology where you cut straight lines

127
00:04:33,030 --> 00:04:30,800
and do transects

128
00:04:35,430 --> 00:04:33,040
it's dense thick undergrowth and

129
00:04:38,870 --> 00:04:35,440
overgrowth and what we have found in the

130
00:04:41,030 --> 00:04:38,880
satellite imagery a vegetation signature

131
00:04:43,430 --> 00:04:41,040
which is showing us the location the

132
00:04:46,070 --> 00:04:43,440
position the diameter the circumference

133
00:04:48,870 --> 00:04:46,080
of all the maya sites beneath this

134
00:04:49,990 --> 00:04:48,880
pristine tropical forest

135
00:04:52,629 --> 00:04:50,000
so just from the difference of the

136
00:04:54,469 --> 00:04:52,639
vegetation that's i guess grown over

137
00:04:56,550 --> 00:04:54,479
some of the buildings you're able to to

138
00:04:58,550 --> 00:04:56,560

see where it is right

139

00:04:59,909 --> 00:04:58,560

uh this is what it looks like today as

140

00:05:01,909 --> 00:04:59,919

we would see it but this is not what the

141

00:05:04,230 --> 00:05:01,919

maya would have seen uh in their

142

00:05:06,710 --> 00:05:04,240

constructions they would have had to

143

00:05:10,150 --> 00:05:06,720

burn 20 trees just to make a square

144

00:05:12,390 --> 00:05:10,160

meter of plaza of plaster for their

145

00:05:13,590 --> 00:05:12,400

buildings and temples and roadways and

146

00:05:16,070 --> 00:05:13,600

plazas

147

00:05:18,150 --> 00:05:16,080

this is a lot of deforestation that took

148

00:05:19,830 --> 00:05:18,160

place they would have seen a tilled

149

00:05:22,230 --> 00:05:19,840

landscape and would have seen

150

00:05:23,830 --> 00:05:22,240

agricultural fields one after the other

151
00:05:25,830 --> 00:05:23,840
and from the city tops they would have

152
00:05:28,230 --> 00:05:25,840
seen the next city and so forth they

153
00:05:30,390 --> 00:05:28,240
would not have seen what we think today

154
00:05:32,469 --> 00:05:30,400
is a pristine environment but over time

155
00:05:33,350 --> 00:05:32,479
all this vegetation is has grown back

156
00:05:35,430 --> 00:05:33,360
over

157
00:05:38,070 --> 00:05:35,440
uh all of those all of those cities

158
00:05:40,710 --> 00:05:38,080
right and what's fascinating is 1200

159
00:05:43,029 --> 00:05:40,720
years later we can still see the effects

160
00:05:44,790 --> 00:05:43,039
of humans in a landscape

161
00:05:46,070 --> 00:05:44,800
not only can we see the cities but we

162
00:05:48,070 --> 00:05:46,080
can also see

163
00:05:50,950 --> 00:05:48,080

the maya roadways that connect the

164

00:05:53,830 --> 00:05:50,960

cities we can see the water storage

165

00:05:55,430 --> 00:05:53,840

areas the canals that let us understand

166

00:05:57,430 --> 00:05:55,440

better how they were practicing

167

00:06:00,310 --> 00:05:57,440

agriculture to sustain this dense

168

00:06:02,629 --> 00:06:00,320

population what's amazing about this i

169

00:06:05,430 --> 00:06:02,639

think is that the maya disappear from

170

00:06:06,790 --> 00:06:05,440

this region we can look back 1200 years

171

00:06:08,230 --> 00:06:06,800

and see how

172

00:06:10,390 --> 00:06:08,240

they went about destroying their

173

00:06:13,350 --> 00:06:10,400

landscape and changing their climate if

174

00:06:16,070 --> 00:06:13,360

they had had the ability of severe the

175

00:06:17,830 --> 00:06:16,080

access to gis technology to satellites

176

00:06:19,909 --> 00:06:17,840

they could have seen what they were

177

00:06:21,830 --> 00:06:19,919

doing and prevented the destruction that

178

00:06:23,350 --> 00:06:21,840

took place here that's some amazing

179

00:06:27,430 --> 00:06:23,360

research time and thank you so much for

180

00:06:30,309 --> 00:06:28,950

bill i didn't even know nasa had an

181

00:06:31,749 --> 00:06:30,319

archaeologist that's right and he'll be

182

00:06:33,350 --> 00:06:31,759

heading back to central america and

183

00:06:34,790 --> 00:06:33,360

going to places around the world in the

184

00:06:35,990 --> 00:06:34,800

future and as far as the wind tunnel is

185

00:06:37,029 --> 00:06:36,000

concerned they make some amazing

186

00:06:39,110 --> 00:06:37,039

discoveries and that's been around a

187

00:06:40,070 --> 00:06:39,120

long time even longer than you

188

00:06:41,670 --> 00:06:40,080

thank you