NASA SCIENCE LIVE

VIRTUAL EDITION

LANDSAT

A LEGACY OF SEEING EARTH FROM SPACE

1
00:00:21,109 --> 00:00:13,140
[Music]

2
00:00:26,230 --> 00:00:24,070
hello and welcome to another episode of

3
00:00:29,109 --> 00:00:26,240
nasa science live

4
00:00:32,069 --> 00:00:29,119
i'm your host jacob richmond

5
00:00:34,470 --> 00:00:32,079
this past monday september 27th the

6
00:00:36,549 --> 00:00:34,480
landsat 9 satellite launched from

7
00:00:37,910 --> 00:00:36,559
vandenberg space force base in

8
00:00:40,709 --> 00:00:37,920
california

9
00:00:43,030 --> 00:00:40,719
it was the latest in a legendary legacy

10
00:00:45,190 --> 00:00:43,040
of satellites that have been monitoring

11
00:00:48,229 --> 00:00:45,200
and tracking changes across earth's

12
00:00:50,470 --> 00:00:48,239
landscapes for nearly 50 years

13
00:00:53,590 --> 00:00:50,480

the mission is a joint effort between

14
00:00:56,549 --> 00:00:53,600
nasa and the u.s geological survey

15
00:00:58,630 --> 00:00:56,559
and it has provided the longest running

16
00:01:01,270 --> 00:00:58,640
satellite data record of our changing

17
00:01:06,070 --> 00:01:03,430
landsat satellites allow us to measure

18
00:01:08,950 --> 00:01:06,080
how the earth is changing over time

19
00:01:09,990 --> 00:01:08,960
with landsat 9 joining landsat 8 in

20
00:01:12,230 --> 00:01:10,000
space

21
00:01:15,030 --> 00:01:12,240
they'll each be circling the globe every

22
00:01:17,990 --> 00:01:15,040
99 minutes and together we'll collect

23
00:01:19,429 --> 00:01:18,000
images of nearly the entire earth every

24
00:01:21,670 --> 00:01:19,439
eight days

25
00:01:23,749 --> 00:01:21,680
that constant source of high quality

26
00:01:25,830 --> 00:01:23,759
data will help to answer the many

27
00:01:26,870 --> 00:01:25,840
questions we have about earth's changing

28
00:01:29,990 --> 00:01:26,880
climate

29
00:01:31,590 --> 00:01:30,000
urban sprawl and even our very own food

30
00:01:34,230 --> 00:01:31,600
supply

31
00:01:35,429 --> 00:01:34,240
landsat data is also free and open to

32
00:01:37,590 --> 00:01:35,439
anyone

33
00:01:39,990 --> 00:01:37,600
which means decision makers from around

34
00:01:41,749 --> 00:01:40,000
the world can use it to better monitor

35
00:01:44,389 --> 00:01:41,759
land use changes

36
00:01:47,109 --> 00:01:44,399
manage agricultural practices

37
00:01:49,590 --> 00:01:47,119
allocate scarce water resources

38
00:01:51,510 --> 00:01:49,600

respond to environmental disasters and

39
00:01:53,270 --> 00:01:51,520
much more

40
00:01:55,429 --> 00:01:53,280
and i'm very happy to tell you all that

41
00:01:57,350 --> 00:01:55,439
we have some very accomplished earth

42
00:01:59,510 --> 00:01:57,360
science researchers joining our show

43
00:02:00,550 --> 00:01:59,520
today and they'll answer some of my

44
00:02:02,069 --> 00:02:00,560
questions

45
00:02:04,230 --> 00:02:02,079
and a little later we'll be taking

46
00:02:05,030 --> 00:02:04,240
questions from our viewers as well

47
00:02:07,030 --> 00:02:05,040
so

48
00:02:08,469 --> 00:02:07,040
starting now you can submit your

49
00:02:10,309 --> 00:02:08,479
questions using

50
00:02:11,830 --> 00:02:10,319
landsat on social

51
00:02:14,070 --> 00:02:11,840
or just drop your question in the

52
00:02:15,270 --> 00:02:14,080
comment box wherever you're watching

53
00:02:16,229 --> 00:02:15,280
this

54
00:02:18,390 --> 00:02:16,239
first

55
00:02:27,270 --> 00:02:18,400
let's learn a little bit more about that

56
00:02:32,309 --> 00:02:29,830
[Music]

57
00:02:34,470 --> 00:02:32,319
the blue marble

58
00:02:35,430 --> 00:02:34,480
that was our first

59
00:02:36,949 --> 00:02:35,440
view

60
00:02:39,190 --> 00:02:36,959
of ourselves

61
00:02:40,470 --> 00:02:39,200
we really are the blue planet we're

62
00:02:42,309 --> 00:02:40,480
hanging out here in the middle of

63
00:02:46,030 --> 00:02:42,319

nowhere

64
00:02:48,830 --> 00:02:46,040
in fact apollo imagery was part of the

65
00:02:52,390 --> 00:02:48,840
justification for putting together a

66
00:02:55,190 --> 00:02:52,400
satellite that would look at the earth

67
00:02:57,509 --> 00:02:55,200
that satellite was the first landsat

68
00:02:59,509 --> 00:02:57,519
the landsat mission now holds the title

69
00:03:04,550 --> 00:02:59,519
for the longest continuous space-based

70
00:03:09,750 --> 00:03:06,630
at least one landsat satellite has been

71
00:03:13,190 --> 00:03:09,760
orbiting the earth since 1972 that's

72
00:03:14,790 --> 00:03:13,200
nearly 50 years of steadfast observation

73
00:03:16,949 --> 00:03:14,800
the program was born in the midst of

74
00:03:20,309 --> 00:03:16,959
several historical flashpoints during a

75
00:03:22,229 --> 00:03:20,319
time when the world was changing quickly

76
00:03:24,550 --> 00:03:22,239
but the landsat story doesn't actually

77
00:03:27,430 --> 00:03:24,560
start with nasa it starts with the

78
00:03:29,670 --> 00:03:27,440
united states geological survey

79
00:03:31,190 --> 00:03:29,680
but let's pause for a second obviously

80
00:03:33,589 --> 00:03:31,200
there was a big push to make an earth

81
00:03:35,190 --> 00:03:33,599
observing satellite but what exactly did

82
00:03:37,670 --> 00:03:35,200
it need to do

83
00:03:39,830 --> 00:03:37,680
landsat's entire job is to collect light

84
00:03:41,190 --> 00:03:39,840
visible light like this and non-visible

85
00:03:43,350 --> 00:03:41,200
light like this

86
00:03:45,589 --> 00:03:43,360
after landsat captures the light it sees

87
00:03:48,630 --> 00:03:45,599
it can make two kinds of pictures true

88
00:03:50,309 --> 00:03:48,640

color images and false color images

89
00:03:52,630 --> 00:03:50,319
did you know your eyes can only detect

90
00:03:54,470 --> 00:03:52,640
red green and blue it sounds crazy but

91
00:03:55,910 --> 00:03:54,480
it's true in fact if you took a

92
00:03:57,750 --> 00:03:55,920
magnifying glass to the screen you're

93
00:04:00,229 --> 00:03:57,760
probably looking at right now you'd see

94
00:04:01,589 --> 00:04:00,239
a jumble of red green and blue dots mix

95
00:04:03,589 --> 00:04:01,599
those colors together with different

96
00:04:05,910 --> 00:04:03,599
intensities and your brain interprets

97
00:04:08,149 --> 00:04:05,920
all the colors of the rainbow true color

98
00:04:10,229 --> 00:04:08,159
images are made by combining red blue

99
00:04:12,869 --> 00:04:10,239
and green light but what's even more

100
00:04:15,190 --> 00:04:12,879
amazing landsat also captures infrared

101
00:04:17,270 --> 00:04:15,200
light beyond what we can see and that

102
00:04:19,349 --> 00:04:17,280
light can reveal some incredible things

103
00:04:20,789 --> 00:04:19,359
when you look at a false color image

104
00:04:22,790 --> 00:04:20,799
like the difference between types of

105
00:04:24,629 --> 00:04:22,800
plants how healthy those plants are

106
00:04:27,189 --> 00:04:24,639
healthy coral reefs and even dead coral

107
00:04:30,390 --> 00:04:27,199
reefs fire tracking ocean pollution the

108
00:04:32,310 --> 00:04:30,400
possibilities are nearly endless

109
00:04:35,670 --> 00:04:32,320
the true test came when landsat 1

110
00:04:37,749 --> 00:04:35,680
launched on july 23 1972

111
00:04:40,070 --> 00:04:37,759
but with this launch the united states

112
00:04:42,390 --> 00:04:40,080
and soon the world would step into a new

113
00:04:44,150 --> 00:04:42,400

paradigm of earth observation

114
00:04:46,070 --> 00:04:44,160
never before seen snapshot of land

115
00:04:48,550 --> 00:04:46,080
resources in the environment would be

116
00:04:49,390 --> 00:04:48,560
key for critical decision making decades

117
00:04:55,350 --> 00:04:49,400
into the future

118
00:05:01,830 --> 00:04:58,550
we are now joined by nasa research

119
00:05:05,110 --> 00:05:01,840
assistant nikki tooley nikki thank you

120
00:05:06,870 --> 00:05:05,120
so much for being with us today

121
00:05:09,350 --> 00:05:06,880
thank you thank you for having me and i

122
00:05:10,710 --> 00:05:09,360
appreciate being here today

123
00:05:13,670 --> 00:05:10,720
of course

124
00:05:15,749 --> 00:05:13,680
so nikki as you may know i recently

125
00:05:17,990 --> 00:05:15,759
heard your story and your background and

126
00:05:19,909 --> 00:05:18,000
how you got started in this research and

127
00:05:22,070 --> 00:05:19,919
so i definitely need you to tell our

128
00:05:23,670 --> 00:05:22,080
viewers about that so if you could

129
00:05:25,110 --> 00:05:23,680
give us a little bit of that background

130
00:05:27,510 --> 00:05:25,120
and specifically

131
00:05:30,710 --> 00:05:27,520
how landsat was involved in a very

132
00:05:32,390 --> 00:05:30,720
memorable moment of your life

133
00:05:34,310 --> 00:05:32,400
sure thank you so

134
00:05:36,070 --> 00:05:34,320
uh the story that you just heard that

135
00:05:38,629 --> 00:05:36,080
was shared with you was

136
00:05:40,870 --> 00:05:38,639
as a result of the usgs human dimensions

137
00:05:42,469 --> 00:05:40,880
and ladies of landsat collaboration and

138
00:05:45,029 --> 00:05:42,479

in that story you heard that i'm a

139
00:05:47,430 --> 00:05:45,039
member of the navajo nation which is one

140
00:05:49,909 --> 00:05:47,440
of over 500 native american tribes

141
00:05:52,310 --> 00:05:49,919
located in the united states and in that

142
00:05:54,550 --> 00:05:52,320
story it further shares some background

143
00:05:55,909 --> 00:05:54,560
of who i am and where i come from and

144
00:05:57,749 --> 00:05:55,919
one of the things you'll learn is that

145
00:05:59,830 --> 00:05:57,759
one of the first homes that i grew up in

146
00:06:02,230 --> 00:05:59,840
didn't have running water and so we had

147
00:06:04,629 --> 00:06:02,240
to haul water from local watering points

148
00:06:07,430 --> 00:06:04,639
to support our livelihood and i believe

149
00:06:09,590 --> 00:06:07,440
that it is from that point that i began

150
00:06:11,909 --> 00:06:09,600
to get a interest in water science and

151
00:06:14,230 --> 00:06:11,919
so growing up i was surrounded in this

152
00:06:16,070 --> 00:06:14,240
area by family and we spoke a particular

153
00:06:17,990 --> 00:06:16,080
language which was the the navajo

154
00:06:20,390 --> 00:06:18,000
language and so when i went to college

155
00:06:22,150 --> 00:06:20,400
in the pursuit of an academic career

156
00:06:24,469 --> 00:06:22,160
that is one thing that came as a huge

157
00:06:26,150 --> 00:06:24,479
shock was culture shock being leaving a

158
00:06:28,629 --> 00:06:26,160
landscape that i knew and the people

159
00:06:30,790 --> 00:06:28,639
that i knew and was surrounded by and so

160
00:06:32,710 --> 00:06:30,800
luckily for me when i took a remote

161
00:06:34,950 --> 00:06:32,720
sensing class i learned about landsat

162
00:06:37,029 --> 00:06:34,960
and what the data produce

163
00:06:39,029 --> 00:06:37,039

provides and so that comes in the in the

164
00:06:41,350 --> 00:06:39,039
area of earth observation satellite

165
00:06:43,670 --> 00:06:41,360
imagery and so within that way i used

166
00:06:44,469 --> 00:06:43,680
landsat to remind me of home to be able

167
00:06:46,710 --> 00:06:44,479
to

168
00:06:48,870 --> 00:06:46,720
look at the the landscape that i grew up

169
00:06:51,510 --> 00:06:48,880
on and to not feel so homesick and to

170
00:06:53,350 --> 00:06:51,520
feel a way of having a connection to

171
00:06:55,909 --> 00:06:53,360
home and in many ways working with the

172
00:06:57,830 --> 00:06:55,919
nasa weyodi set project and the current

173
00:07:00,390 --> 00:06:57,840
role that i'm in i feel that that again

174
00:07:02,950 --> 00:07:00,400
has brought me away back home again and

175
00:07:04,870 --> 00:07:02,960
in reality landsat helps us have that

176
00:07:08,390 --> 00:07:04,880
relation to home as we all live on

177
00:07:10,230 --> 00:07:08,400
planet earth and earth is our home

178
00:07:12,070 --> 00:07:10,240
i think that the truth so you mentioned

179
00:07:13,670 --> 00:07:12,080
a couple of terms

180
00:07:15,670 --> 00:07:13,680
i've been hearing a lot of those terms

181
00:07:17,430 --> 00:07:15,680
lately uh here working in nasa earth

182
00:07:19,110 --> 00:07:17,440
science especially during the summer

183
00:07:21,589 --> 00:07:19,120
months when we've had

184
00:07:23,270 --> 00:07:21,599
heat waves and droughts so you you

185
00:07:25,670 --> 00:07:23,280
mentioned way o

186
00:07:27,510 --> 00:07:25,680
and you also mentioned d set i know you

187
00:07:30,150 --> 00:07:27,520
know a lot about both of those but our

188
00:07:31,749 --> 00:07:30,160

audience may not uh very important terms

189
00:07:33,990 --> 00:07:31,759
those are so can you please explain what

190
00:07:36,150 --> 00:07:34,000
those mean and then please you know

191
00:07:38,230 --> 00:07:36,160
specifically just how has the navajo

192
00:07:40,870 --> 00:07:38,240
nation drought project helped that

193
00:07:42,870 --> 00:07:40,880
community where you grew up

194
00:07:44,790 --> 00:07:42,880
yeah so at the time i joined the team i

195
00:07:46,869 --> 00:07:44,800
helped i joined the team to help in

196
00:07:48,710 --> 00:07:46,879
these capacity building efforts to look

197
00:07:50,629 --> 00:07:48,720
at dsat which is the drought severity

198
00:07:53,270 --> 00:07:50,639
evaluation tool which at the time was

199
00:07:55,749 --> 00:07:53,280
funded by nasa wayo the western water

200
00:07:57,350 --> 00:07:55,759
applications office and so this project

201
00:07:59,350 --> 00:07:57,360
was co-developed with the desert

202
00:08:02,070 --> 00:07:59,360
research institute in the navajo nation

203
00:08:04,550 --> 00:08:02,080
department of water resources so dset

204
00:08:06,629 --> 00:08:04,560
uses remote sensing remote sensing that

205
00:08:08,790 --> 00:08:06,639
is modeled within situ data that is all

206
00:08:10,950 --> 00:08:08,800
combined into this one web interface

207
00:08:12,950 --> 00:08:10,960
that you see here on the screen that was

208
00:08:15,110 --> 00:08:12,960
really designed to be user friendly to

209
00:08:17,110 --> 00:08:15,120
meet the unique challenges of water

210
00:08:19,430 --> 00:08:17,120
management on the navajo nation so what

211
00:08:22,070 --> 00:08:19,440
does that all mean what dsa does is it

212
00:08:24,550 --> 00:08:22,080
uses satellite imagery to tell a story

213
00:08:26,469 --> 00:08:24,560

through the light of the landscape and

214
00:08:28,790 --> 00:08:26,479
so landsat is one of these satellite

215
00:08:31,029 --> 00:08:28,800
databases that is used to with other

216
00:08:32,790 --> 00:08:31,039
data that is collected and verified the

217
00:08:34,709 --> 00:08:32,800
department of water resources has

218
00:08:36,630 --> 00:08:34,719
contributed some ground-based data to

219
00:08:38,870 --> 00:08:36,640
where we can look at these interactions

220
00:08:40,709 --> 00:08:38,880
between the data we see coming from the

221
00:08:42,149 --> 00:08:40,719
satellites and the data we see coming

222
00:08:43,990 --> 00:08:42,159
from the ground

223
00:08:45,590 --> 00:08:44,000
to be able to use these drought

224
00:08:48,630 --> 00:08:45,600
monitoring efforts looking at

225
00:08:50,470 --> 00:08:48,640
precipitation looking at snow ultimately

226
00:08:51,829 --> 00:08:50,480
looking at the impact of drought on the

227
00:08:53,910 --> 00:08:51,839
landscapes through these drought

228
00:08:55,110 --> 00:08:53,920
conditions to further analyze crop

229
00:08:56,630 --> 00:08:55,120
analysis

230
00:08:58,710 --> 00:08:56,640
surface water

231
00:08:59,990 --> 00:08:58,720
and also to be able to look at the

232
00:09:02,230 --> 00:09:00,000
snowpack

233
00:09:06,070 --> 00:09:02,240
state so overall looking at the impact

234
00:09:10,790 --> 00:09:08,630
imagine crops and i know you probably

235
00:09:13,110 --> 00:09:10,800
know more than most this this phrase

236
00:09:13,910 --> 00:09:13,120
water is life right and

237
00:09:16,710 --> 00:09:13,920
and

238
00:09:18,550 --> 00:09:16,720

obviously on that list of what we need

239
00:09:19,829 --> 00:09:18,560
to survive is food and there's a very

240
00:09:21,590 --> 00:09:19,839
you know

241
00:09:22,550 --> 00:09:21,600
direct correlation and relationship

242
00:09:24,870 --> 00:09:22,560
between

243
00:09:27,670 --> 00:09:24,880
water supply food supply what can you

244
00:09:28,790 --> 00:09:27,680
tell us about how landsat and other nasa

245
00:09:31,350 --> 00:09:28,800
satellites

246
00:09:33,190 --> 00:09:31,360
are involved in monitoring that food

247
00:09:35,030 --> 00:09:33,200
supply

248
00:09:38,630 --> 00:09:35,040
sure i totally agree with you in that

249
00:09:40,389 --> 00:09:38,640
statement water is life in my language

250
00:09:42,150 --> 00:09:40,399
and in thousands of other ways we can

251
00:09:44,070 --> 00:09:42,160
definitely translate that statement

252
00:09:45,910 --> 00:09:44,080
because it is true that across the globe

253
00:09:48,470 --> 00:09:45,920
the importance of water and food will

254
00:09:50,470 --> 00:09:48,480
remain a constant uh issue of great

255
00:09:52,070 --> 00:09:50,480
importance that we're all familiar with

256
00:09:53,829 --> 00:09:52,080
i just shared with you some ways that

257
00:09:55,750 --> 00:09:53,839
satellite data is being used in a

258
00:09:58,150 --> 00:09:55,760
particular way to look at the impacts of

259
00:09:59,990 --> 00:09:58,160
the water cycle we need water to grow

260
00:10:02,230 --> 00:10:00,000
vegetation and oftentimes that

261
00:10:04,310 --> 00:10:02,240
vegetation is to grow food when our

262
00:10:06,069 --> 00:10:04,320
water resources are impacted that

263
00:10:08,710 --> 00:10:06,079

impacts our food production which can

264
00:10:10,790 --> 00:10:08,720
ultimately impact food security drought

265
00:10:13,430 --> 00:10:10,800
is one of those major events to continue

266
00:10:15,430 --> 00:10:13,440
to monitor earth is a big place however

267
00:10:17,509 --> 00:10:15,440
we need to understand that as one planet

268
00:10:19,269 --> 00:10:17,519
we're all connected so how does nasa

269
00:10:21,990 --> 00:10:19,279
satellite data help us to track and

270
00:10:23,509 --> 00:10:22,000
monitor our our food and what we drink

271
00:10:25,030 --> 00:10:23,519
so just think about the last time you

272
00:10:27,509 --> 00:10:25,040
went to the grocery store and you seen

273
00:10:29,509 --> 00:10:27,519
that beautiful display of produce and

274
00:10:31,990 --> 00:10:29,519
often times the water is missing there

275
00:10:34,150 --> 00:10:32,000
do we ever give a moment to think about

276
00:10:36,790 --> 00:10:34,160
what it took to get that piece of fruit

277
00:10:38,870 --> 00:10:36,800
or vegetable to our hands to enjoy it if

278
00:10:40,470 --> 00:10:38,880
not that's okay but millions of others

279
00:10:42,230 --> 00:10:40,480
in different ways have thought about

280
00:10:44,870 --> 00:10:42,240
that question in different ways to use

281
00:10:47,269 --> 00:10:44,880
satellite data to be able to monitor

282
00:10:49,990 --> 00:10:47,279
that to ensure that we have that food or

283
00:10:51,190 --> 00:10:50,000
that bottle of water available to us to

284
00:10:53,110 --> 00:10:51,200
to consume

285
00:10:55,910 --> 00:10:53,120
and so that's what satellite data helps

286
00:10:58,389 --> 00:10:55,920
us to do the satellite data continuously

287
00:10:59,829 --> 00:10:58,399
collects these images to tell the story

288
00:11:01,430 --> 00:10:59,839

that we're interested in what's

289
00:11:03,350 --> 00:11:01,440
happening on the landscape what's

290
00:11:05,350 --> 00:11:03,360
impacting our crops and what are the

291
00:11:07,829 --> 00:11:05,360
state that the production of crops are

292
00:11:10,150 --> 00:11:07,839
in satellite data for example can help

293
00:11:12,790 --> 00:11:10,160
us to understand soil moisture which is

294
00:11:15,190 --> 00:11:12,800
a really big area of how much water is

295
00:11:17,829 --> 00:11:15,200
in the soil and how might that

296
00:11:20,630 --> 00:11:17,839
impact the crop production satellite

297
00:11:21,910 --> 00:11:20,640
data also helps us to look at irrigation

298
00:11:24,389 --> 00:11:21,920
crop yield

299
00:11:26,949 --> 00:11:24,399
crop production productivity and many

300
00:11:29,190 --> 00:11:26,959
other soil and crop characteristics that

301
00:11:30,870 --> 00:11:29,200
go into getting that seed that is

302
00:11:33,750 --> 00:11:30,880
planted in the earth to food on our

303
00:11:37,269 --> 00:11:35,509
thank you i mean normally when that

304
00:11:39,750 --> 00:11:37,279
mister comes out of the produce aisle my

305
00:11:42,389 --> 00:11:39,760
first reaction is to get out of the way

306
00:11:44,389 --> 00:11:42,399
but now i have a totally different

307
00:11:46,630 --> 00:11:44,399
thought that we'll all take with me

308
00:11:48,150 --> 00:11:46,640
every time i'm in the grocery store

309
00:11:49,670 --> 00:11:48,160
thank you for that and thank you for

310
00:11:51,990 --> 00:11:49,680
joining us nikki

311
00:11:53,269 --> 00:11:52,000
um we will be back with you nikki a

312
00:11:55,750 --> 00:11:53,279
little bit later to answer some of our

313
00:11:58,150 --> 00:11:55,760

viewer questions and again get those in

314
00:11:59,910 --> 00:11:58,160
right now if you want to using

315
00:12:02,150 --> 00:11:59,920
landsat

316
00:12:03,670 --> 00:12:02,160
and as we can see the data we receive

317
00:12:05,910 --> 00:12:03,680
from landsat and lots of other

318
00:12:07,269 --> 00:12:05,920
satellites really are important to our

319
00:12:10,069 --> 00:12:07,279
everyday lives

320
00:12:11,430 --> 00:12:10,079
even down to how we source our food so

321
00:12:13,670 --> 00:12:11,440
with that in mind

322
00:12:17,430 --> 00:12:13,680
how about we head right to the kitchen

323
00:12:19,590 --> 00:12:17,440
and see how nasa data is being served up

324
00:12:21,990 --> 00:12:19,600
my name is jocelyn argeta i'm your host

325
00:12:24,069 --> 00:12:22,000
kathleen gaida and this is snack time

326
00:12:26,230 --> 00:12:24,079
with nasa so we can send a rubber to

327
00:12:28,470 --> 00:12:26,240
mars but now the question is can we make

328
00:12:30,949 --> 00:12:28,480
a tasty dip and this is my dog buoy and

329
00:12:33,190 --> 00:12:30,959
we both really love cheese i will eat a

330
00:12:34,710 --> 00:12:33,200
space potato in my lifetime i promise

331
00:12:37,590 --> 00:12:34,720
you that because

332
00:12:39,500 --> 00:12:37,600
it's my first time and i'm not

333
00:12:41,350 --> 00:12:39,510
not sure how it's gonna taste

334
00:12:42,949 --> 00:12:41,360
[Music]

335
00:12:45,190 --> 00:12:42,959
so bad

336
00:12:47,509 --> 00:12:45,200
did you know that nasa plays a big part

337
00:12:50,150 --> 00:12:47,519
in the food you eat we use data from

338
00:12:53,910 --> 00:12:50,160

space to monitor agriculture and track

339
00:12:56,490 --> 00:12:53,920
food security so coincidentally we have

340
00:13:00,790 --> 00:12:56,500
some of the crops that we keep an eye on

341
00:13:05,030 --> 00:13:03,030
you tell us a little bit about why nasa

342
00:13:06,870 --> 00:13:05,040
studied agriculture in the first place

343
00:13:08,870 --> 00:13:06,880
when we're known more for space

344
00:13:10,790 --> 00:13:08,880
exploration than cooking

345
00:13:13,910 --> 00:13:10,800
as we all know

346
00:13:15,829 --> 00:13:13,920
our planet earth is also a planet and so

347
00:13:17,590 --> 00:13:15,839
nasa has satellites that are pointing

348
00:13:19,509 --> 00:13:17,600
out into space but it also has a lot of

349
00:13:21,110 --> 00:13:19,519
earth observing satellites pointing air

350
00:13:22,870 --> 00:13:21,120
down at earth and of course that's

351
00:13:24,710 --> 00:13:22,880
really critical because we live here and

352
00:13:26,629 --> 00:13:24,720
that's important for us to track and

353
00:13:28,470 --> 00:13:26,639
understand how we're changing our planet

354
00:13:31,190 --> 00:13:28,480
how our planet is responding and in

355
00:13:33,269 --> 00:13:31,200
particular um tracking agriculture which

356
00:13:35,750 --> 00:13:33,279
is what we're concerned with here food

357
00:13:38,150 --> 00:13:35,760
security and agriculture are one of the

358
00:13:40,790 --> 00:13:38,160
biggest challenges we face in in this

359
00:13:42,710 --> 00:13:40,800
century and nasa's satellite data since

360
00:13:44,389 --> 00:13:42,720
actually going back to early days of

361
00:13:45,990 --> 00:13:44,399
satellite monitoring there has always

362
00:13:48,230 --> 00:13:46,000
been a large focus on agriculture

363
00:13:50,710 --> 00:13:48,240

agriculture covers a huge part of our

364
00:13:52,870 --> 00:13:50,720
land system and what that does is that

365
00:13:55,509 --> 00:13:52,880
helps us to get an accurate and a timely

366
00:13:57,990 --> 00:13:55,519
understanding of potential shortfalls or

367
00:13:59,269 --> 00:13:58,000
surplus of crops and fruit production

368
00:14:01,590 --> 00:13:59,279
around the world

369
00:14:03,269 --> 00:14:01,600
so i have edamame in front of me and

370
00:14:05,030 --> 00:14:03,279
what i believe to be the most underrated

371
00:14:05,760 --> 00:14:05,040
part of a cheese board which are carrots

372
00:14:07,509 --> 00:14:05,770
and olives

373
00:14:09,590 --> 00:14:07,519
[Music]

374
00:14:10,710 --> 00:14:09,600
yeah those are pretty uh water intensive

375
00:14:12,230 --> 00:14:10,720
crops

376
00:14:13,910 --> 00:14:12,240
and they're grown in the central valley

377
00:14:16,069 --> 00:14:13,920
which is some place where where proper

378
00:14:17,910 --> 00:14:16,079
water management is really critical i

379
00:14:20,550 --> 00:14:17,920
see you have some grapes there too

380
00:14:22,710 --> 00:14:20,560
speaking of grapes nasa has an ongoing

381
00:14:24,629 --> 00:14:22,720
project with the us department of

382
00:14:26,550 --> 00:14:24,639
agriculture and vietnamese in california

383
00:14:29,670 --> 00:14:26,560
called great backs where we're using

384
00:14:32,230 --> 00:14:29,680
data from landsat satellite along with

385
00:14:34,069 --> 00:14:32,240
multiple other uh space and ground-based

386
00:14:36,389 --> 00:14:34,079
observation sources and advanced

387
00:14:38,230 --> 00:14:36,399
computer models to help to schedule

388
00:14:40,069 --> 00:14:38,240

irrigation for these vineyards and

389
00:14:41,990 --> 00:14:40,079
therefore preserve

390
00:14:44,230 --> 00:14:42,000
the precious resource water it's really

391
00:14:46,230 --> 00:14:44,240
precious in california well it seems to

392
00:14:47,430 --> 00:14:46,240
me that instruments onboard the iss are

393
00:14:49,189 --> 00:14:47,440
pretty crucial when it comes to

394
00:14:50,790 --> 00:14:49,199
monitoring our human cause climate

395
00:14:54,389 --> 00:14:50,800
change

396
00:14:56,310 --> 00:14:54,399
yes and the really great thing about

397
00:14:58,550 --> 00:14:56,320
ecostress is that it complements these

398
00:15:01,110 --> 00:14:58,560
other instruments and other satellites

399
00:15:03,829 --> 00:15:01,120
like landsat to create a continuous

400
00:15:06,150 --> 00:15:03,839
long-term record of the earth's system

401
00:15:07,670 --> 00:15:06,160
and right now nasa is working on future

402
00:15:09,910 --> 00:15:07,680
missions that will build on these

403
00:15:11,990 --> 00:15:09,920
records to provide climate scientists a

404
00:15:14,230 --> 00:15:12,000
holistic view of the earth and this

405
00:15:16,310 --> 00:15:14,240
provides us really unique insights to

406
00:15:18,710 --> 00:15:16,320
how vegetation and forest around the

407
00:15:25,590 --> 00:15:18,720
world are reacting to environmental and

408
00:15:31,110 --> 00:15:28,150
keeping an eye on our food sources is

409
00:15:32,870 --> 00:15:31,120
just one of the many applications of

410
00:15:34,470 --> 00:15:32,880
landsat data

411
00:15:36,150 --> 00:15:34,480
there's another big one that we've all

412
00:15:38,230 --> 00:15:36,160
heard about especially in the summertime

413
00:15:40,870 --> 00:15:38,240

months as well and that is helping

414
00:15:43,189 --> 00:15:40,880
scientists monitor wildfires and their

415
00:15:45,990 --> 00:15:43,199
effects across our planet

416
00:15:47,749 --> 00:15:46,000
to tackle that topic i'll now welcome in

417
00:15:49,910 --> 00:15:47,759
dr liz hoy

418
00:15:52,550 --> 00:15:49,920
a senior scientist at nasa's goddard

419
00:15:54,550 --> 00:15:52,560
space flight center liz thank you so

420
00:15:57,430 --> 00:15:54,560
much for being on the show

421
00:15:59,749 --> 00:15:57,440
thanks for having me

422
00:16:02,710 --> 00:15:59,759
our pleasure and first just like i did

423
00:16:04,870 --> 00:16:02,720
with nikki i'm told you have a memorable

424
00:16:07,269 --> 00:16:04,880
moment from early in your career that

425
00:16:09,189 --> 00:16:07,279
involves fires and landsat could you

426
00:16:10,949 --> 00:16:09,199
share that with us

427
00:16:12,949 --> 00:16:10,959
yeah well nikki's story was incredible

428
00:16:15,110 --> 00:16:12,959
to hear and i so appreciate that she

429
00:16:17,590 --> 00:16:15,120
shared it with us i started using

430
00:16:19,910 --> 00:16:17,600
landsat imagery to look at forest fires

431
00:16:21,749 --> 00:16:19,920
back as an undergraduate in college and

432
00:16:24,069 --> 00:16:21,759
then as a graduate student i actually

433
00:16:26,150 --> 00:16:24,079
got to go to alaska and there are these

434
00:16:28,790 --> 00:16:26,160
cold northern forests there that can

435
00:16:31,269 --> 00:16:28,800
really burn during wildfires and i would

436
00:16:33,030 --> 00:16:31,279
dig in in the soil and try to understand

437
00:16:35,670 --> 00:16:33,040
how much carbon is released from these

438
00:16:37,590 --> 00:16:35,680

fires and then as a phd student i

439
00:16:40,389 --> 00:16:37,600
actually had the opportunity to take my

440
00:16:42,389 --> 00:16:40,399
infant son with me to alaska my husband

441
00:16:45,030 --> 00:16:42,399
came he took his paternity leave and the

442
00:16:46,790 --> 00:16:45,040
three of us traveled around and camped

443
00:16:49,030 --> 00:16:46,800
and i took measurements of this soil

444
00:16:50,949 --> 00:16:49,040
layer that burned and i would compare it

445
00:16:52,870 --> 00:16:50,959
with landsat imagery so it was an

446
00:16:56,150 --> 00:16:52,880
incredible experience for us but it was

447
00:16:58,069 --> 00:16:56,160
daunting for us as parents

448
00:17:00,790 --> 00:16:58,079
i know i was just gonna say when i first

449
00:17:04,150 --> 00:17:00,800
had our infant i also wanted to go to

450
00:17:05,990 --> 00:17:04,160
alaska and document wildfires but

451
00:17:08,470 --> 00:17:06,000
actually that's not true

452
00:17:10,230 --> 00:17:08,480
we're surviving but thank you for your

453
00:17:12,069 --> 00:17:10,240
work there um

454
00:17:14,549 --> 00:17:12,079
one thing i also learned from just

455
00:17:16,470 --> 00:17:14,559
working here in earth science at nasa

456
00:17:18,470 --> 00:17:16,480
is that fires aren't just sort of an

457
00:17:19,750 --> 00:17:18,480
acute thing that pop up every once in a

458
00:17:21,829 --> 00:17:19,760
while in certain areas they are

459
00:17:23,909 --> 00:17:21,839
constantly happening around the world a

460
00:17:25,990 --> 00:17:23,919
lot of them so could you just take a

461
00:17:28,309 --> 00:17:26,000
second and describe the the global

462
00:17:29,590 --> 00:17:28,319
phenomenon of fires in a way that helps

463
00:17:32,710 --> 00:17:29,600

people like me

464
00:17:35,350 --> 00:17:32,720
understand the scope and scale of them

465
00:17:38,070 --> 00:17:35,360
yeah sure wildfire is a natural

466
00:17:39,190 --> 00:17:38,080
occurrence across the landscape and we

467
00:17:43,830 --> 00:17:39,200
have

468
00:17:46,630 --> 00:17:43,840
about the area of the size of the

469
00:17:48,870 --> 00:17:46,640
european union burns every year so it's

470
00:17:51,830 --> 00:17:48,880
an incredible amount of fire

471
00:17:54,630 --> 00:17:51,840
fire clears underbrush fire helps new

472
00:17:56,789 --> 00:17:54,640
seeds to grow and fire also just helps

473
00:17:58,870 --> 00:17:56,799
to keep forests in their natural cycles

474
00:18:01,029 --> 00:17:58,880
of of growth

475
00:18:03,430 --> 00:18:01,039
we use this landsat imagery for is we

476
00:18:05,990 --> 00:18:03,440
can see where fires are burning

477
00:18:08,470 --> 00:18:06,000
how what their frequency is how severe

478
00:18:10,230 --> 00:18:08,480
they are how intense these fires are and

479
00:18:12,870 --> 00:18:10,240
they can really help us to have a big

480
00:18:16,950 --> 00:18:12,880
picture of this of this fire and where

481
00:18:20,470 --> 00:18:18,630
i mean we also know there are lots of

482
00:18:21,909 --> 00:18:20,480
satellites up in space doing lots of

483
00:18:24,310 --> 00:18:21,919
different measurements many of them are

484
00:18:25,990 --> 00:18:24,320
involved in fire research in some form

485
00:18:28,390 --> 00:18:26,000
or fashion but can you describe how

486
00:18:29,270 --> 00:18:28,400
landsat works in harmony with those

487
00:18:30,950 --> 00:18:29,280
other

488
00:18:33,270 --> 00:18:30,960

satellites up there as well to

489
00:18:37,029 --> 00:18:33,280
understand fires

490
00:18:39,110 --> 00:18:37,039
sure yeah so landsat landsat 9 now up

491
00:18:41,669 --> 00:18:39,120
there that's going to give us

492
00:18:44,230 --> 00:18:41,679
along with landsat 8 a view every eight

493
00:18:46,710 --> 00:18:44,240
days of where fires are on the landscape

494
00:18:48,230 --> 00:18:46,720
and when we take into account other

495
00:18:49,909 --> 00:18:48,240
satellite imagery as well from

496
00:18:52,070 --> 00:18:49,919
comparable satellites we're having a

497
00:18:54,310 --> 00:18:52,080
view every two to three days so with

498
00:18:55,750 --> 00:18:54,320
this 50-year record that we already have

499
00:18:58,150 --> 00:18:55,760
we're getting an incredible amount of

500
00:19:00,710 --> 00:18:58,160
data in i like to think about a family

501
00:19:02,470 --> 00:19:00,720
photo album so if you have a picture of

502
00:19:04,230 --> 00:19:02,480
someone as a baby and then you're able

503
00:19:06,789 --> 00:19:04,240
to watch them grow until they're a 50

504
00:19:08,549 --> 00:19:06,799
year old adult you're really seeing how

505
00:19:10,230 --> 00:19:08,559
how they're changing over time and we're

506
00:19:12,470 --> 00:19:10,240
seeing that with with this landsat

507
00:19:14,390 --> 00:19:12,480
imagery now too having this record

508
00:19:16,070 --> 00:19:14,400
really helps us to

509
00:19:18,310 --> 00:19:16,080
look at all these different aspects of

510
00:19:20,230 --> 00:19:18,320
wildfire and really better understand

511
00:19:23,029 --> 00:19:20,240
how it's impacting the landscape and

512
00:19:25,190 --> 00:19:23,039
then how fire and resource managers can

513
00:19:26,950 --> 00:19:25,200

take that imagery and use it to better

514
00:19:31,510 --> 00:19:26,960
allocate resources where there might be

515
00:19:34,310 --> 00:19:32,470
i know

516
00:19:35,990 --> 00:19:34,320
some of us tend to think of fires also

517
00:19:38,789 --> 00:19:36,000
as an effect

518
00:19:40,950 --> 00:19:38,799
of the hotter drier climate as that's

519
00:19:42,390 --> 00:19:40,960
intensifying but there's another aspect

520
00:19:45,350 --> 00:19:42,400
of that i think we should know more

521
00:19:46,070 --> 00:19:45,360
about and that's the effects from fires

522
00:19:48,630 --> 00:19:46,080
so

523
00:19:49,669 --> 00:19:48,640
what can landsat and other nasa data

524
00:19:53,110 --> 00:19:49,679
teach us

525
00:19:55,270 --> 00:19:53,120
about the after fire consequences of of

526
00:19:57,750 --> 00:19:55,280
fires on earth whether that's on the

527
00:19:59,190 --> 00:19:57,760
land or in the atmosphere

528
00:20:00,950 --> 00:19:59,200
sure yeah so

529
00:20:03,110 --> 00:20:00,960
landsat imagery as well as other

530
00:20:04,950 --> 00:20:03,120
satellite products from nasa and others

531
00:20:07,350 --> 00:20:04,960
they are really useful in understanding

532
00:20:08,710 --> 00:20:07,360
how wildfire is impacting the land and

533
00:20:10,870 --> 00:20:08,720
the atmosphere so i'll start with the

534
00:20:12,549 --> 00:20:10,880
atmosphere and when a fire burns it's

535
00:20:14,710 --> 00:20:12,559
releasing a lot of carbon into the

536
00:20:16,789 --> 00:20:14,720
atmosphere those emissions and that

537
00:20:18,470 --> 00:20:16,799
smoke it's all going into the atmosphere

538
00:20:20,070 --> 00:20:18,480

that can actually cause the atmosphere

539
00:20:22,549 --> 00:20:20,080
to warm which can actually create

540
00:20:24,230 --> 00:20:22,559
conditions for more fire down the road

541
00:20:26,870 --> 00:20:24,240
so that's one thing then the second

542
00:20:29,029 --> 00:20:26,880
thing is that these emissions the smoke

543
00:20:30,870 --> 00:20:29,039
can be really harmful for human health

544
00:20:33,590 --> 00:20:30,880
so when we think about it we have to

545
00:20:35,350 --> 00:20:33,600
think about where where is the smoke and

546
00:20:37,350 --> 00:20:35,360
how are people going to be impacted are

547
00:20:39,909 --> 00:20:37,360
we going to have more people in the

548
00:20:42,149 --> 00:20:39,919
emergency room with respiratory issues

549
00:20:44,950 --> 00:20:42,159
this smoke can also travel thousands of

550
00:20:46,310 --> 00:20:44,960
miles and so there are other examples

551
00:20:49,029 --> 00:20:46,320
for example

552
00:20:50,870 --> 00:20:49,039
in the canadian wildfires have actually

553
00:20:52,789 --> 00:20:50,880
the smoke from those fires have actually

554
00:20:55,350 --> 00:20:52,799
traveled all the way over to greenland

555
00:20:57,830 --> 00:20:55,360
and have uh been deposited on the ice

556
00:20:59,909 --> 00:20:57,840
sheets there and it's resulted in more

557
00:21:02,950 --> 00:20:59,919
melting of the ice sheets because that

558
00:21:05,510 --> 00:21:02,960
that soot warms up more than than the

559
00:21:07,190 --> 00:21:05,520
ice wood normally but then i also want

560
00:21:08,950 --> 00:21:07,200
to point out that

561
00:21:11,190 --> 00:21:08,960
there are really important impacts on

562
00:21:13,190 --> 00:21:11,200
the land as well and so this is where

563
00:21:14,789 --> 00:21:13,200

this is some of the work i do comes in

564
00:21:18,230 --> 00:21:14,799
and so we're looking at

565
00:21:19,669 --> 00:21:18,240
how forest fires across the landscape

566
00:21:22,230 --> 00:21:19,679
how those areas

567
00:21:23,750 --> 00:21:22,240
recover after a fire and we can see

568
00:21:27,029 --> 00:21:23,760
where there might be the potential for

569
00:21:29,750 --> 00:21:27,039
erosion or for landslides and so we're

570
00:21:31,990 --> 00:21:29,760
looking at how the land recovers from a

571
00:21:33,590 --> 00:21:32,000
fire what vegetation is coming back

572
00:21:35,350 --> 00:21:33,600
where might there be a risk and then we

573
00:21:37,750 --> 00:21:35,360
can give that information to land

574
00:21:40,310 --> 00:21:37,760
managers fire managers natural resource

575
00:21:41,909 --> 00:21:40,320
managers to help them to understand

576
00:21:45,909 --> 00:21:41,919
where they might need to allocate

577
00:21:50,390 --> 00:21:48,470
liz thank you so much those are all very

578
00:21:51,990 --> 00:21:50,400
fascinating answers about something

579
00:21:53,750 --> 00:21:52,000
that's uh

580
00:21:55,350 --> 00:21:53,760
terrible and fascinating all at the same

581
00:21:57,029 --> 00:21:55,360
time so thanks for your work and please

582
00:21:58,789 --> 00:21:57,039
don't go anywhere

583
00:22:01,190 --> 00:21:58,799
it's now time to take some questions

584
00:22:03,430 --> 00:22:01,200
from our viewers

585
00:22:05,750 --> 00:22:03,440
so if you're just tuning in remember you

586
00:22:08,310 --> 00:22:05,760
can still have your questions answered

587
00:22:10,070 --> 00:22:08,320
live right here just use

588
00:22:12,230 --> 00:22:10,080

landsat on social

589
00:22:13,350 --> 00:22:12,240
or the comment box from wherever you are

590
00:22:15,270 --> 00:22:13,360
watching

591
00:22:16,950 --> 00:22:15,280
and since many of you are already

592
00:22:19,110 --> 00:22:16,960
watching on social i wanted to mention

593
00:22:21,110 --> 00:22:19,120
one other thing that the whole landsat

594
00:22:23,310 --> 00:22:21,120
team is enjoying

595
00:22:25,110 --> 00:22:23,320
uh as we speak which is hashtag

596
00:22:26,630 --> 00:22:25,120
landsatcraft

597
00:22:28,230 --> 00:22:26,640
so if you don't have a question but you

598
00:22:30,470 --> 00:22:28,240
want to help us communicate about the

599
00:22:32,870 --> 00:22:30,480
mission here's what to do

600
00:22:35,110 --> 00:22:32,880
go to the landsat image gallery you can

601
00:22:37,590 --> 00:22:35,120
search that up it's easy to find online

602
00:22:39,430 --> 00:22:37,600
there's tons of great images scroll

603
00:22:40,630 --> 00:22:39,440
until you find an image that inspires

604
00:22:43,669 --> 00:22:40,640
you

605
00:22:46,310 --> 00:22:43,679
then create something artistic or crafty

606
00:22:48,149 --> 00:22:46,320
based on that image take a photo or two

607
00:22:50,710 --> 00:22:48,159
share it with us on social media using

608
00:22:53,029 --> 00:22:50,720
that hashtag landsatcraft

609
00:22:55,110 --> 00:22:53,039
and if you don't do art but you like to

610
00:22:57,029 --> 00:22:55,120
look at art go check out the hashtag

611
00:22:59,669 --> 00:22:57,039
anyway we've already gotten a lot of

612
00:23:00,950 --> 00:22:59,679
amazing creative contributions

613
00:23:03,029 --> 00:23:00,960

all right

614
00:23:04,630 --> 00:23:03,039
now let's bring back nikki and liz to

615
00:23:07,190 --> 00:23:04,640
answer those questions and again thank

616
00:23:09,830 --> 00:23:07,200
you both for staying with us

617
00:23:11,110 --> 00:23:09,840
our first question is from james on

618
00:23:14,310 --> 00:23:11,120
facebook

619
00:23:16,950 --> 00:23:14,320
he asks how are you working with usgs to

620
00:23:19,350 --> 00:23:16,960
better understand hazards so liz i'll

621
00:23:20,549 --> 00:23:19,360
kick that one over to you

622
00:23:23,270 --> 00:23:20,559
sure so

623
00:23:25,270 --> 00:23:23,280
um it's it's a combination of nasa and

624
00:23:27,909 --> 00:23:25,280
usgs that really put these landsat

625
00:23:29,430 --> 00:23:27,919
satellites up into orbit and so we're

626
00:23:32,950 --> 00:23:29,440
getting a lot of our imagery actually

627
00:23:35,270 --> 00:23:32,960
through usgs channels but uh even usgs

628
00:23:37,510 --> 00:23:35,280
and nasa work together to make some burn

629
00:23:40,310 --> 00:23:37,520
severity products that we use to really

630
00:23:42,870 --> 00:23:40,320
understand what's happening after a fire

631
00:23:44,149 --> 00:23:42,880
burns or how severe it burned and then

632
00:23:45,830 --> 00:23:44,159
trying to understand what's going to

633
00:23:47,350 --> 00:23:45,840
happen in that region after a fire so

634
00:23:50,070 --> 00:23:47,360
it's really a combination between both

635
00:23:51,750 --> 00:23:50,080
of those agencies

636
00:23:54,230 --> 00:23:51,760
thank you

637
00:23:56,149 --> 00:23:54,240
tim on facebook asks and this will be

638
00:23:58,149 --> 00:23:56,159

for you nikki he says

639
00:24:00,310 --> 00:23:58,159
while you no doubt see much land

640
00:24:03,830 --> 00:24:00,320
becoming unusable are there areas that

641
00:24:08,549 --> 00:24:06,149
yeah so just i think that question can

642
00:24:10,630 --> 00:24:08,559
go back to looking at the the human

643
00:24:12,789 --> 00:24:10,640
impacts but also the nature impacts just

644
00:24:15,350 --> 00:24:12,799
to what to speak to what liz shared with

645
00:24:17,430 --> 00:24:15,360
us and so i really find it interesting

646
00:24:19,350 --> 00:24:17,440
that there's this opportunity that

647
00:24:20,950 --> 00:24:19,360
satellite imagery provides us for

648
00:24:23,909 --> 00:24:20,960
example that was just discussed with

649
00:24:25,830 --> 00:24:23,919
wildfire how we can monitor the impacts

650
00:24:27,430 --> 00:24:25,840
that wildfire has on the landscape

651
00:24:30,230 --> 00:24:27,440
escapes whether they're connected to

652
00:24:31,430 --> 00:24:30,240
agriculture lands or to to places that

653
00:24:34,149 --> 00:24:31,440
are of

654
00:24:36,470 --> 00:24:34,159
more open areas but with that imagery

655
00:24:38,950 --> 00:24:36,480
we're able to see the revegetation that

656
00:24:41,510 --> 00:24:38,960
comes back from the wildfires and then

657
00:24:43,990 --> 00:24:41,520
as was mentioned we're also able to put

658
00:24:45,990 --> 00:24:44,000
input into looking at how we might help

659
00:24:48,149 --> 00:24:46,000
with erosion that comes with the

660
00:24:49,830 --> 00:24:48,159
wildfires that impact a watershed or

661
00:24:51,350 --> 00:24:49,840
we're able to look at how we might help

662
00:24:53,590 --> 00:24:51,360
the vegetation

663
00:24:55,350 --> 00:24:53,600

come back to some of the natural state

664
00:24:56,549 --> 00:24:55,360
that it was at before and i think those

665
00:24:58,870 --> 00:24:56,559
are two ways

666
00:25:00,710 --> 00:24:58,880
together in which the the natural cycle

667
00:25:04,230 --> 00:25:00,720
and the human impact can come together

668
00:25:05,590 --> 00:25:04,240
in helping those landscapes

669
00:25:07,190 --> 00:25:05,600
for sure

670
00:25:09,350 --> 00:25:07,200
and this next question i want you both

671
00:25:12,390 --> 00:25:09,360
to answer but we'll start with you liz

672
00:25:14,710 --> 00:25:12,400
elda pena also on facebook asks what

673
00:25:18,230 --> 00:25:14,720
surprises have these landsat

674
00:25:22,789 --> 00:25:20,070
surprises well

675
00:25:24,870 --> 00:25:22,799
i i'm always surprised when uh when we

676
00:25:26,710 --> 00:25:24,880
when we're able to figure out what we're

677
00:25:29,909 --> 00:25:26,720
what we're looking at and understand it

678
00:25:32,149 --> 00:25:29,919
in a new way i'm i'm surprised when i

679
00:25:35,029 --> 00:25:32,159
learn about how severely burned certain

680
00:25:37,029 --> 00:25:35,039
areas are sometimes you know it's hard

681
00:25:39,269 --> 00:25:37,039
to really see it and what we can do with

682
00:25:41,110 --> 00:25:39,279
this landsat imagery is we can look at a

683
00:25:43,190 --> 00:25:41,120
at an entire area somewhere at times

684
00:25:44,710 --> 00:25:43,200
it's remote locations we can't always

685
00:25:46,950 --> 00:25:44,720
get there but when we can use the

686
00:25:49,830 --> 00:25:46,960
landsat imagery we can really look at

687
00:25:51,590 --> 00:25:49,840
these larger areas and on on regional

688
00:25:55,430 --> 00:25:51,600

scales it's just incredible how much

689
00:25:59,990 --> 00:25:57,750
absolutely i can imagine

690
00:26:02,390 --> 00:26:00,000
all right we have a question from

691
00:26:03,350 --> 00:26:02,400
mordecai on twitter

692
00:26:05,110 --> 00:26:03,360
and

693
00:26:08,070 --> 00:26:05,120
the question is how long is

694
00:26:10,870 --> 00:26:08,080
commissioning calibration and validation

695
00:26:11,909 --> 00:26:10,880
before people can start using landsat 9

696
00:26:13,430 --> 00:26:11,919
data

697
00:26:15,029 --> 00:26:13,440
so i'll take that one a little bit we

698
00:26:17,190 --> 00:26:15,039
also have a question right after that

699
00:26:19,350 --> 00:26:17,200
from tui missing on facebook which is a

700
00:26:21,669 --> 00:26:19,360
similar question about when

701
00:26:23,350 --> 00:26:21,679
uh where will landsat 9 images be

702
00:26:25,990 --> 00:26:23,360
available so

703
00:26:28,390 --> 00:26:26,000
the the shortest answer to that to those

704
00:26:30,310 --> 00:26:28,400
questions is that the data is managed by

705
00:26:32,310 --> 00:26:30,320
the us geological survey that's why it's

706
00:26:33,350 --> 00:26:32,320
a partner mission so that typically

707
00:26:35,990 --> 00:26:33,360
happens

708
00:26:38,470 --> 00:26:36,000
at 100 days after launch so

709
00:26:40,470 --> 00:26:38,480
realistically when that data is

710
00:26:42,230 --> 00:26:40,480
has become open and available for the

711
00:26:44,070 --> 00:26:42,240
public and researchers and everyone to

712
00:26:45,750 --> 00:26:44,080
use that'll be

713
00:26:48,149 --> 00:26:45,760

probably early january after the

714
00:26:50,149 --> 00:26:48,159
holidays but that's uh just a little bit

715
00:26:53,750 --> 00:26:50,159
after that 100 day mark

716
00:26:58,149 --> 00:26:53,760
and you can just head over to the usgs

717
00:27:03,750 --> 00:27:00,950
all right linda on facebook asks how

718
00:27:05,990 --> 00:27:03,760
long will the satellite last um so liz i

719
00:27:08,390 --> 00:27:06,000
know you've been you know studying

720
00:27:10,230 --> 00:27:08,400
remote sensing for a long time

721
00:27:11,830 --> 00:27:10,240
um with data from a lot of different

722
00:27:13,830 --> 00:27:11,840
satellites and they're all a little bit

723
00:27:16,549 --> 00:27:13,840
different but do your best and predict

724
00:27:18,230 --> 00:27:16,559
how long the nasa landsat 9 satellite

725
00:27:19,750 --> 00:27:18,240
will last for us

726
00:27:21,350 --> 00:27:19,760
well one thing that's been really great

727
00:27:23,430 --> 00:27:21,360
about the landsat program is that some

728
00:27:26,230 --> 00:27:23,440
of the satellites have actually outlived

729
00:27:27,750 --> 00:27:26,240
their expected lifespan so we've we as

730
00:27:29,590 --> 00:27:27,760
we said in that video in the beginning

731
00:27:31,430 --> 00:27:29,600
we've had a satellite that's been up

732
00:27:33,750 --> 00:27:31,440
there um at least one of these

733
00:27:36,470 --> 00:27:33,760
satellites for almost 50 years and so i

734
00:27:38,389 --> 00:27:36,480
hope landsat 9 you know exceeds its its

735
00:27:39,669 --> 00:27:38,399
design life and stays up there for many

736
00:27:41,669 --> 00:27:39,679
years

737
00:27:43,669 --> 00:27:41,679
and then we keep going with this program

738
00:27:45,029 --> 00:27:43,679

because having this long-term look

739
00:27:48,470 --> 00:27:45,039
really helps us to understand how the

740
00:27:52,789 --> 00:27:50,149
absolutely

741
00:27:54,950 --> 00:27:52,799
well that is about all the time we have

742
00:27:56,310 --> 00:27:54,960
liz and nikki thank you again so much

743
00:28:00,070 --> 00:27:56,320
for joining us today it's been a

744
00:28:03,430 --> 00:28:01,590
yeah yeah thanks thank you for this

745
00:28:06,630 --> 00:28:03,440
opportunity

746
00:28:10,630 --> 00:28:09,029
and thanks to all of you our viewers for

747
00:28:12,630 --> 00:28:10,640
joining us online

748
00:28:14,789 --> 00:28:12,640
like we mentioned before landsat 9

749
00:28:17,110 --> 00:28:14,799
launched on monday from vandenberg space

750
00:28:20,230 --> 00:28:17,120
force base and is now continuing the

751
00:28:22,470 --> 00:28:20,240
nearly 50-year legacy of this amazing

752
00:28:23,590 --> 00:28:22,480
legendary earth observing satellite

753
00:28:25,669 --> 00:28:23,600
program

754
00:28:27,909 --> 00:28:25,679
you can stay up to date on how nasa

755
00:28:30,389 --> 00:28:27,919
studies our home planet all the time

756
00:28:32,630 --> 00:28:30,399
by following at nasa earth on facebook

757
00:28:35,029 --> 00:28:32,640
twitter and instagram

758
00:28:36,470 --> 00:28:35,039
and if you want to learn more about all

759
00:28:38,549 --> 00:28:36,480
things landsat

760
00:28:40,710 --> 00:28:38,559
we just recently released a really cool

761
00:28:43,510 --> 00:28:40,720
interactive website so go check that out

762
00:28:44,470 --> 00:28:43,520
at nasa.gov

763
00:28:46,389 --> 00:28:44,480

764
00:28:48,549 --> 00:28:46,399
again i'm jacob richmond and it's been

765
00:28:50,950 --> 00:28:48,559
an honor to be your host for nasa

766
00:28:54,350 --> 00:28:50,960
science live we hope to see you at the