



1
00:00:13,549 --> 00:00:11,839
since we're probably never going to get

2
00:00:15,289 --> 00:00:13,559
to the surface of Titan and be able to

3
00:00:17,180 --> 00:00:15,299
pick up the rocks and take samples of

4
00:00:19,849 --> 00:00:17,190
the liquid we want to be able to

5
00:00:23,300 --> 00:00:19,859
understand a place that we can get to

6
00:00:25,460 --> 00:00:23,310
and then draw conclusions about Titan we

7
00:00:27,980 --> 00:00:25,470
believe that geology is geology

8
00:00:30,410 --> 00:00:27,990
everywhere so we've come to death valley

9
00:00:32,959 --> 00:00:30,420
to racetrack playa it's dry lake right

10
00:00:34,910 --> 00:00:32,969
now but it's a lake nonetheless so we

11
00:00:37,549 --> 00:00:34,920
can look for similar pieces of evidence

12
00:00:39,290 --> 00:00:37,559
the reason we do that is we can crawl

13
00:00:41,450 --> 00:00:39,300

around Death Valley and measure things

14

00:00:43,459 --> 00:00:41,460

we can find out what's happening we can

15

00:00:45,470 --> 00:00:43,469

find out what causes that the evidence

16

00:00:53,240 --> 00:00:45,480

to occur and it's just like a detective

17

00:00:56,240 --> 00:00:53,250

game from there on so whenever you have

18

00:00:57,970 --> 00:00:56,250

a high thing next to a low thing you can

19

00:01:00,799 --> 00:00:57,980

be sure that something's going to happen

20

00:01:03,950 --> 00:01:00,809

nature likes to even itself out on

21

00:01:06,530 --> 00:01:03,960

Ontario Lokus we have high things right

22

00:01:08,330 --> 00:01:06,540

next to low things so the rainfall is

23

00:01:10,399 --> 00:01:08,340

going to move the material from the high

24

00:01:13,429 --> 00:01:10,409

to the low and it's going to form these

25

00:01:15,590 --> 00:01:13,439

same alluvial fans that where material

26

00:01:17,630 --> 00:01:15,600

washes out from the gully like it does

27

00:01:23,520 --> 00:01:17,640

here and it's going to flow the material

28

00:01:30,460 --> 00:01:27,999

at Ontario lochus there are pieces of

29

00:01:32,620 --> 00:01:30,470

bedrock like this only probably made out

30

00:01:35,020 --> 00:01:32,630

of water ice that make fingers that

31

00:01:37,510 --> 00:01:35,030

extend down into the lake it's as though

32

00:01:39,609 --> 00:01:37,520

the lake had risen up and flooded those

33

00:01:41,740 --> 00:01:39,619

valleys now this is a much smaller

34

00:01:43,840 --> 00:01:41,750

example than we see it Ontario lochus

35

00:01:46,059 --> 00:01:43,850

but it tells us that the level of the

36

00:01:55,419 --> 00:01:46,069

water is what has made this into a

37

00:01:56,740 --> 00:01:55,429

finger not the finger itself on Titan we

38

00:01:58,839 --> 00:01:56,750

think that the lakes are filled by

39

00:02:00,730 --> 00:01:58,849

seasonal drainages sometimes those

40

00:02:02,830 --> 00:02:00,740

drainages make cross-hatched patterns

41

00:02:04,149 --> 00:02:02,840

that look like gullies so we looked on

42

00:02:06,609 --> 00:02:04,159

earth for a place that has those

43

00:02:08,859 --> 00:02:06,619

cross-hatched gullies and here we find

44

00:02:11,160 --> 00:02:08,869

it at racetrack playa water that comes

45

00:02:13,750 --> 00:02:11,170

down from those hills flows in

46

00:02:17,860 --> 00:02:13,760

infrequent but violent thunderstorms out

47

00:02:20,610 --> 00:02:17,870

onto racetrack playa as the rainfall

48

00:02:22,990 --> 00:02:20,620

comes down closer to the playa on Titan

49

00:02:24,789 --> 00:02:23,000

they form Delta something like the

50

00:02:27,400 --> 00:02:24,799

Mississippi Delta out there this is a

51
00:02:29,440 --> 00:02:27,410
dry lake bed so what happens is that the

52
00:02:31,990 --> 00:02:29,450
gravel just gets pushed out onto the

53
00:02:35,979 --> 00:02:32,000
lake bed and that's a clue that what's

54
00:02:38,530 --> 00:02:35,989
happening on Titan is a fluid not a dry

55
00:02:42,789 --> 00:02:38,540
lake bed so by studying the relationship

56
00:02:44,440 --> 00:02:42,799
between the evidence and the events here

57
00:02:47,229 --> 00:02:44,450
in Death Valley where we can measure

58
00:02:49,420 --> 00:02:47,239
them we can connect that same set of

59
00:02:51,879 --> 00:02:49,430
evidence to the events that might have

60
00:02:53,830 --> 00:02:51,889
happened on Titan it's important because

61
00:02:56,710 --> 00:02:53,840
if we're going to find life somewhere

62
00:02:58,569 --> 00:02:56,720
else in the universe it has to have