

**HOW WIND
MADE THESE
MARKS ON MARS**



1
00:00:04,789 --> 00:00:03,030
winds on mars can both help and hurt

2
00:00:06,789 --> 00:00:04,799
spacecraft so we're getting really

3
00:00:08,500 --> 00:00:06,799
creative in how to study winds on the

4
00:00:14,150 --> 00:00:08,510
surface of mars over a large region

5
00:00:15,829 --> 00:00:14,160
[Music]

6
00:00:18,070 --> 00:00:15,839
we're here at nasa's jet propulsion

7
00:00:20,710 --> 00:00:18,080
laboratory in the space flight

8
00:00:23,349 --> 00:00:20,720
operations facility also known as the

9
00:00:25,830 --> 00:00:23,359
dark room this is where engineers send

10
00:00:27,990 --> 00:00:25,840
commands and receive data from jpl

11
00:00:30,870 --> 00:00:28,000
missions including nasa's mars

12
00:00:32,790 --> 00:00:30,880
reconnaissance orbiter now detailed

13
00:00:34,709 --> 00:00:32,800

images from the orbiter are helping

14

00:00:35,910 --> 00:00:34,719

scientists better understand martian

15

00:00:38,869 --> 00:00:35,920

winds

16

00:00:40,869 --> 00:00:38,879

leslie tamperi is mro's deputy project

17

00:00:42,950 --> 00:00:40,879

scientist leslie what are we seeing in

18

00:00:44,790 --> 00:00:42,960

these images so what you can see here

19

00:00:46,630 --> 00:00:44,800

are dark patches on the surface of the

20

00:00:48,709 --> 00:00:46,640

ice near the south polar region and

21

00:00:50,950 --> 00:00:48,719

they're created by gas jets that come

22

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

from under that ice up through cracks

23

00:00:56,069 --> 00:00:53,840

and deliver that dust out onto the ice

24

00:00:58,549 --> 00:00:56,079

and the wind will carry that dust and

25

00:00:59,990 --> 00:00:58,559

lay it on the surface forming these fans

26
00:01:01,670 --> 00:01:00,000
and what we can do with this information

27
00:01:02,630 --> 00:01:01,680
is we can look at the directions and the

28
00:01:04,070 --> 00:01:02,640
sizes

29
00:01:06,550 --> 00:01:04,080
and we can try to understand what the

30
00:01:08,870 --> 00:01:06,560
wind field is doing and i understand

31
00:01:11,990 --> 00:01:08,880
that volunteers played a large role in

32
00:01:15,030 --> 00:01:12,000
this research yes they did we have taken

33
00:01:18,070 --> 00:01:15,040
about 75 000 images over all of mars

34
00:01:21,749 --> 00:01:18,080
with our mro highrise camera we used

35
00:01:23,749 --> 00:01:21,759
citizen scientists 80 000 volunteers to

36
00:01:25,109 --> 00:01:23,759
map these fans and map their directions

37
00:01:27,190 --> 00:01:25,119
and sizes

38
00:01:29,670 --> 00:01:27,200

why is it important to study wind

39

00:01:31,590 --> 00:01:29,680

direction on mars some of our landers

40

00:01:33,510 --> 00:01:31,600

and rovers have had wind measurements

41

00:01:34,950 --> 00:01:33,520

but only in a few locations at a few

42

00:01:36,550 --> 00:01:34,960

different times but winds are very

43

00:01:38,950 --> 00:01:36,560

important for understanding today's

44

00:01:40,550 --> 00:01:38,960

climate on mars but also for trying to

45

00:01:43,190 --> 00:01:40,560

understand how the climate was different

46

00:01:44,870 --> 00:01:43,200

in the past we also have huge dust

47

00:01:47,190 --> 00:01:44,880

storms that occur on mars sometimes but

48

00:01:49,749 --> 00:01:47,200

we don't understand why some storms

49

00:01:51,510 --> 00:01:49,759

become global and some don't so we're

50

00:01:52,950 --> 00:01:51,520

trying to understand the wind field to

51
00:01:55,109 --> 00:01:52,960
try to put all these pieces together to

52
00:01:57,429 --> 00:01:55,119
understand mars better and how does that

53
00:01:59,910 --> 00:01:57,439
information help protect nasa's

54
00:02:01,670 --> 00:01:59,920
spacecraft right it's very important for

55
00:02:03,910 --> 00:02:01,680
not only spacecraft but probably future

56
00:02:06,230 --> 00:02:03,920
human exploration as well because dust

57
00:02:08,389 --> 00:02:06,240
it can be dangerous to hardware

58
00:02:10,070 --> 00:02:08,399
for example on the perseverance rover

59
00:02:12,710 --> 00:02:10,080
we're fortunate enough to have a wind

60
00:02:14,229 --> 00:02:12,720
sensor and we're measuring dust devils

61
00:02:16,070 --> 00:02:14,239
and a couple of these dust devils and

62
00:02:18,309 --> 00:02:16,080
wind events were so large they picked up

63
00:02:20,309 --> 00:02:18,319

not only dust but bigger particles sand

64

00:02:21,510 --> 00:02:20,319

sized particles and in fact some of the

65

00:02:24,229 --> 00:02:21,520

wind sensors were damaged on the

66

00:02:26,630 --> 00:02:24,239

perseverance rover in other locations we

67

00:02:29,110 --> 00:02:26,640

see hardly any dust devils for example

68

00:02:30,790 --> 00:02:29,120

the inside lander has solar panels the

69

00:02:33,589 --> 00:02:30,800

solar panels are completely covered with

70

00:02:34,869 --> 00:02:33,599

dust and so the power is waning and we'd

71

00:02:36,150 --> 00:02:34,879

really like to see some dust devils

72

00:02:37,910 --> 00:02:36,160

coming by so that they could clean off

73

00:02:39,430 --> 00:02:37,920

those solar panels and provide insight

74

00:02:41,110 --> 00:02:39,440

with some more power

75

00:02:42,470 --> 00:02:41,120

so learning about the winds and the

76

00:02:44,630 --> 00:02:42,480

different environments and how they

77

00:02:46,630 --> 00:02:44,640

change across mars will really help us

78

00:02:48,710 --> 00:02:46,640

plan not only for the conditions for

79

00:02:51,750 --> 00:02:48,720

today's spacecraft there but also plan

80

00:02:54,390 --> 00:02:51,760

better for the future thank you leslie

81

00:02:58,070 --> 00:02:54,400

to get the latest updates follow at nasa

82

00:02:59,750 --> 00:02:58,080

jpl and at nasa mars on social media or

83

00:03:03,400 --> 00:02:59,760

take a deeper dive on the mission