
NASA

1
00:00:06,230 --> 00:00:04,150
in addition to the uh spacewalk work

2
00:00:07,749 --> 00:00:06,240
that they performed on the outside of

3
00:00:09,990 --> 00:00:07,759
the station obviously with some

4
00:00:11,669 --> 00:00:10,000
maintenance tasks there's also

5
00:00:13,910 --> 00:00:11,679
a number of experiments that are being

6
00:00:15,910 --> 00:00:13,920
carried out external to the space

7
00:00:18,630 --> 00:00:15,920
station in addition to all the work

8
00:00:20,630 --> 00:00:18,640
inside the station there are numerous

9
00:00:22,790 --> 00:00:20,640
free-flying satellites that orbit the

10
00:00:25,349 --> 00:00:22,800
earth and map our planet for various

11
00:00:27,429 --> 00:00:25,359
areas of research and of course we now

12
00:00:28,950 --> 00:00:27,439
have a new payload that's been installed

13
00:00:30,790 --> 00:00:28,960

on the international space station's

14
00:00:33,910 --> 00:00:30,800
external

15
00:00:35,830 --> 00:00:33,920
segment to give a different perspective

16
00:00:37,430 --> 00:00:35,840
lori meigs is at nasa's payload

17
00:00:38,709 --> 00:00:37,440
operations integration center at the

18
00:00:40,950 --> 00:00:38,719
marshall space flight center in

19
00:00:44,630 --> 00:00:40,960
huntsville alabama to tell us more about

20
00:00:48,709 --> 00:00:46,630
rapidscat is an instrument that will be

21
00:00:50,950 --> 00:00:48,719
used to measure wind speed and direction

22
00:00:53,189 --> 00:00:50,960
of the oceans and it will begin a new

23
00:00:55,430 --> 00:00:53,199
series of mounted satellites on the iss

24
00:00:57,430 --> 00:00:55,440
for weather monitoring i recently spoke

25
00:00:59,830 --> 00:00:57,440
with stephen vols he is nasa's associate

26
00:01:02,150 --> 00:00:59,840
director for flight programs to find out

27
00:01:05,189 --> 00:01:02,160
more about what this new satellite adds

28
00:01:08,870 --> 00:01:06,630
but what we're seeing with the launch of

29
00:01:10,870 --> 00:01:08,880
rapidscat is the first earth science

30
00:01:12,469 --> 00:01:10,880
division earth science focused

31
00:01:13,830 --> 00:01:12,479
measurement that nasa i think is

32
00:01:16,870 --> 00:01:13,840
invested in

33
00:01:19,190 --> 00:01:16,880
that is built for and adapted to the iss

34
00:01:21,510 --> 00:01:19,200
specifically it's an active radar system

35
00:01:22,710 --> 00:01:21,520
it sends microwave radiation down it

36
00:01:24,550 --> 00:01:22,720
transmits it down and if you have a

37
00:01:26,230 --> 00:01:24,560
picture you'll see this is a rotating

38
00:01:28,070 --> 00:01:26,240

dish it transmits a pulse down it's

39
00:01:30,870 --> 00:01:28,080
about 100 watts which is not you know

40
00:01:33,030 --> 00:01:30,880
it's a light bulb um and then it bounces

41
00:01:34,550 --> 00:01:33,040
off the surface of the ocean that radar

42
00:01:36,230 --> 00:01:34,560
now the ocean

43
00:01:37,910 --> 00:01:36,240
is rough or smooth depending on how much

44
00:01:38,950 --> 00:01:37,920
wind there is above the ocean so rough

45
00:01:40,390 --> 00:01:38,960
surface

46
00:01:41,670 --> 00:01:40,400
gives you a different scattering and

47
00:01:44,069 --> 00:01:41,680
we've done a lot of research over the

48
00:01:44,789 --> 00:01:44,079
past 20 years to understand to measure

49
00:01:58,469 --> 00:01:44,799
the

50
00:02:00,149 --> 00:01:58,479
picks up that signal and

51
00:02:02,230 --> 00:02:00,159
records it you can tell the surface

52
00:02:03,510 --> 00:02:02,240
roughness of the ocean and that can be

53
00:02:05,350 --> 00:02:03,520
immediately transferred into a

54
00:02:07,109 --> 00:02:05,360
measurement of the wind speed the wind

55
00:02:09,270 --> 00:02:07,119
velocity at that spot so it gives you

56
00:02:12,150 --> 00:02:09,280
the wind velocity in every spot you look

57
00:02:12,949 --> 00:02:12,160
at so what do we learn from from this

58
00:02:16,229 --> 00:02:12,959
new

59
00:02:18,309 --> 00:02:16,239
rapidscat system um what rapidscat does

60
00:02:20,710 --> 00:02:18,319
and is emblematic of what the iss does

61
00:02:22,949 --> 00:02:20,720
in general it it provides some of the

62
00:02:24,470 --> 00:02:22,959
same measurements that we have that from

63
00:02:26,869 --> 00:02:24,480

quickscap which is another scatterometer

64
00:02:28,550 --> 00:02:26,879
but it it actually does it from using

65
00:02:30,630 --> 00:02:28,560
the iss as a platform it does it in a

66
00:02:32,390 --> 00:02:30,640
different way which is quite unique and

67
00:02:34,869 --> 00:02:32,400
actually very complementary to the the

68
00:02:37,670 --> 00:02:34,879
free flying satellites what uh rapidscat

69
00:02:40,070 --> 00:02:37,680
does it it has a rotating antenna which

70
00:02:41,830 --> 00:02:40,080
which measures vector winds ocean winds

71
00:02:43,509 --> 00:02:41,840
um over a fairly wide spot several

72
00:02:45,430 --> 00:02:43,519
hundred kilometers but it gives us a

73
00:02:47,190 --> 00:02:45,440
rapid repeat and a high visibility of

74
00:02:49,030 --> 00:02:47,200
those areas the tropics regions where we

75
00:02:50,630 --> 00:02:49,040
have the most tropical storms

76
00:02:52,070 --> 00:02:50,640
what it also has is it was built with

77
00:02:53,750 --> 00:02:52,080
the same hardware that was used for

78
00:02:56,309 --> 00:02:53,760
quick scatter quick scatterometer which

79
00:02:58,390 --> 00:02:56,319
was launched in 99 it has the same

80
00:03:00,550 --> 00:02:58,400
accuracy the same spectral resolution

81
00:03:02,630 --> 00:03:00,560
the same measurement technique which was

82
00:03:05,110 --> 00:03:02,640
used then so that data record that was

83
00:03:07,030 --> 00:03:05,120
started in 1999 is picked up by rapid

84
00:03:08,630 --> 00:03:07,040
scout iss rapid scat and then continued

85
00:03:11,030 --> 00:03:08,640
forward and it's one of the key features

86
00:03:12,470 --> 00:03:11,040
of of earth system science is we have

87
00:03:13,990 --> 00:03:12,480
we're looking for decadal science we're

88
00:03:16,390 --> 00:03:14,000

looking at things that vary very

89
00:03:17,509 --> 00:03:16,400
minutely over decades so to do that to

90
00:03:19,589 --> 00:03:17,519
understand that you have to have a

91
00:03:21,270 --> 00:03:19,599
constant and consistent data record

92
00:03:24,149 --> 00:03:21,280
rapidscat will

93
00:03:26,229 --> 00:03:24,159
anchor the 11 or the 14-year record from

94
00:03:27,990 --> 00:03:26,239
quickscat and carry that forward into

95
00:03:29,589 --> 00:03:28,000
the next you know to the next satellites

96
00:03:32,309 --> 00:03:29,599
and and be cross-calibrating them with

97
00:03:34,550 --> 00:03:32,319
um acecat now what iss does which is

98
00:03:36,630 --> 00:03:34,560
really kind of cool and useful for us as

99
00:03:38,229 --> 00:03:36,640
a tool with a measurement is it has it's

100
00:03:39,670 --> 00:03:38,239
in a what we call a precessing orbit

101
00:03:41,750 --> 00:03:39,680
which means it doesn't cross the same

102
00:03:44,630 --> 00:03:41,760
time the same spot on the earth at the

103
00:03:46,710 --> 00:03:44,640
same time of day it covers it varies as

104
00:03:48,789 --> 00:03:46,720
the day rolls by so sometimes it'll

105
00:03:51,270 --> 00:03:48,799
cross over kennedy space center here at

106
00:03:53,110 --> 00:03:51,280
6 a.m sometimes noon 1 p.m et cetera

107
00:03:53,910 --> 00:03:53,120
every hour of the day over a period of

108
00:03:56,949 --> 00:03:53,920
time

109
00:03:59,429 --> 00:03:56,959
they vary on a day-to-day basis

110
00:04:02,149 --> 00:03:59,439
hour-to-hour basis and by doing that by

111
00:04:03,350 --> 00:04:02,159
viewing the winds of globally at various

112
00:04:04,789 --> 00:04:03,360
times of the day you get to see what's

113
00:04:06,949 --> 00:04:04,799

called the diurnal cycle of diurnal

114
00:04:08,390 --> 00:04:06,959
variability now you'll notice here it's

115
00:04:09,990 --> 00:04:08,400
windy in the morning but it's calm at

116
00:04:11,670 --> 00:04:10,000
noon and it's windy in the evening if

117
00:04:13,190 --> 00:04:11,680
you only take measurements at noon you

118
00:04:15,110 --> 00:04:13,200
think it's always calm there's never any

119
00:04:18,069 --> 00:04:15,120
wind no persistent winds by doing it in

120
00:04:19,990 --> 00:04:18,079
multiple times which is what iss enables

121
00:04:22,710 --> 00:04:20,000
you get to see that variability over the

122
00:04:24,150 --> 00:04:22,720
day and that strongly complements the

123
00:04:25,990 --> 00:04:24,160
single crossing time measurements that

124
00:04:27,670 --> 00:04:26,000
we have from our polar satellites so

125
00:04:29,430 --> 00:04:27,680
what do we use this information for when

126
00:04:30,950 --> 00:04:29,440
we get the data what is it used for

127
00:04:32,550 --> 00:04:30,960
there's a weather application and

128
00:04:35,030 --> 00:04:32,560
there's this climate application the

129
00:04:36,790 --> 00:04:35,040
weather application is the output from

130
00:04:39,110 --> 00:04:36,800
quikscat and from rapidscat in the

131
00:04:41,270 --> 00:04:39,120
future goes directly into improving the

132
00:04:43,430 --> 00:04:41,280
numerical weather models that noaa uses

133
00:04:45,030 --> 00:04:43,440
that umetset uses to understand the

134
00:04:47,110 --> 00:04:45,040
intensity of hurricanes for example when

135
00:04:48,550 --> 00:04:47,120
they occur or just weather in general so

136
00:04:50,070 --> 00:04:48,560
it's there are inputs that we've been

137
00:04:52,230 --> 00:04:50,080
providing to the weather services for

138
00:04:54,469 --> 00:04:52,240

the last decade with our scatterometers

139
00:04:55,909 --> 00:04:54,479
which this will continue and add to so

140
00:04:58,310 --> 00:04:55,919
that's that's the weather purpose which

141
00:05:00,390 --> 00:04:58,320
is very very important and improves the

142
00:05:02,469 --> 00:05:00,400
value of our predictions from a climate

143
00:05:04,310 --> 00:05:02,479
point of view what it does is allow the

144
00:05:06,070 --> 00:05:04,320
variability the diurnal variability

145
00:05:08,150 --> 00:05:06,080
allows us to look at a different aspect

146
00:05:09,990 --> 00:05:08,160
of weather of wind variability over a

147
00:05:11,749 --> 00:05:10,000
day that we don't have with our existing

148
00:05:13,990 --> 00:05:11,759
orbiting satellites so that's going to

149
00:05:16,629 --> 00:05:14,000
open up new avenues of investigation and

150
00:05:18,469 --> 00:05:16,639
understanding of how we of how the wind

151
00:05:20,310 --> 00:05:18,479
cycles change in particular spots on a

152
00:05:22,629 --> 00:05:20,320
daily or hourly basis and so a whole

153
00:05:24,710 --> 00:05:22,639
area of research that we have spot data

154
00:05:26,710 --> 00:05:24,720
from airborne science etc but from a

155
00:05:28,390 --> 00:05:26,720
satellite perspective we don't have a

156
00:05:29,830 --> 00:05:28,400
good consistent data record to start you

157
00:05:32,310 --> 00:05:29,840
looking at i think it'll open up new

158
00:05:34,469 --> 00:05:32,320
research areas

159
00:05:36,390 --> 00:05:34,479
and rapid scat engineers tell me this

160
00:05:37,830 --> 00:05:36,400
morning that the data is coming down

161
00:05:40,629 --> 00:05:37,840
looking great and they are still

162
00:05:43,590 --> 00:05:40,639
undergoing calibration but

163
00:05:45,270 --> 00:05:43,600

a successful start to a payload that

164
00:05:47,990 --> 00:05:45,280
should be on the space station for at

165
00:05:49,430 --> 00:05:48,000
least two years taking a live look into

166
00:05:51,909 --> 00:05:49,440
the payload operations integration

167
00:05:53,830 --> 00:05:51,919
center right now we have tj creamer the

168
00:05:55,670 --> 00:05:53,840
payload operations director leading the

169
00:05:57,350 --> 00:05:55,680
team here today and he knows a little

170
00:05:58,950 --> 00:05:57,360
thing or two about being on space

171
00:06:01,110 --> 00:05:58,960
station and running those experiments

172
00:06:03,670 --> 00:06:01,120
himself as an astronaut and also the

173
00:06:05,110 --> 00:06:03,680
paycom want to point out j.p wilson he

174
00:06:06,550 --> 00:06:05,120
just certified this week to become a

175
00:06:08,150 --> 00:06:06,560
pacom and that is the payload

176
00:06:10,070 --> 00:06:08,160
communicator who speaks with the

177
00:06:11,830 --> 00:06:10,080
astronauts and helps them

178
00:06:14,469 --> 00:06:11,840
with all of the experiments that they

179
00:06:16,150 --> 00:06:14,479
are participating in on orbit

180
00:06:18,390 --> 00:06:16,160
and that will do it for us from the

181
00:06:20,309 --> 00:06:18,400
payload operations integration center at

182
00:06:22,150 --> 00:06:20,319
nasa's marshall space flight center now