



1
00:00:01,740 --> 00:00:07,720
[MUSIC]

2
00:00:07,720 --> 00:00:22,900
NASA'S VIEW FROM SPACE SHOWS OUR PLANET
IS CHANGING, BUT TO REALLY UNDERSTAND THE

3
00:00:22,900 --> 00:00:27,580
DEPTHS OF THESE CHANGES AND WHAT THEY MEAN
FOR OUR FUTURE, SCIENTISTS NEED A CLOSER LOOK.

4
00:00:27,580 --> 00:00:32,980
THIS YEAR NASA TAKES YOU ON A SIX-MONTH WORLD
TOUR WITH MAJOR NEW FIELD RESEARCH CAMPAIGNS

5
00:00:32,980 --> 00:00:36,980
TO STUDY REGIONS OF CRITICAL CHANGE FROM THE
LAND, SEA AND...

6
00:00:36,980 --> 00:00:37,980
AIR.

7
00:00:37,980 --> 00:00:39,260
EARTH EXPEDITIONS IS TAKING OFF.

8
00:00:39,260 --> 00:00:43,280
THAT'S RIGHT, AND FIRST IT'S BY PLANE,
TO THE PRISTINE LANDSCAPES OF GREENLAND.

9
00:00:43,280 --> 00:00:47,140
SO WE'RE LITERALLY TAKING OFF, I'M SO
EXCITED!!!

10
00:00:47,140 --> 00:00:48,230
LIKE THE ROYAL WE?

11
00:00:48,230 --> 00:00:50,180
LIKE YOU AND I?

12
00:00:50,180 --> 00:00:51,180
YES.

13
00:00:51,180 --> 00:00:52,180
I THOUGHT SO.

14
00:00:52,180 --> 00:00:53,180
WE'RE NOT GOING ANYWHERE.

15
00:00:53,180 --> 00:00:54,560
WAIT WHAT?

16
00:00:54,560 --> 00:00:58,680
YEAH BUT FORTUNATELY WE'VE GO SOME GREAT
PEOPLE IN THE FIELD TO TALK TO.

17
00:00:58,680 --> 00:01:01,030
I GUESS THAT WORKS TOO.

18
00:01:01,030 --> 00:01:05,070
THE FIRST MISSION THAT WE'RE CHECKING LOOKS
AT GLOBAL SEA LEVEL RISE AND HOW THE OCEANS

19
00:01:05,070 --> 00:01:08,590
ARE MELTING AWAY THE EDGES OF THE GREENLAND
ICE SHEETS.

20
00:01:08,590 --> 00:01:09,640
WAIT.

21
00:01:09,640 --> 00:01:12,409
SO OCEANS ARE MELTING GREENLAND?

22
00:01:12,409 --> 00:01:15,070
YES, OCEANS MELTING GREENLAND?

23
00:01:15,070 --> 00:01:17,350
OMG...THAT SOUNDS SERIOUS.

24

00:01:17,350 --> 00:01:18,350

S-M-H-T-O-M

25

00:01:18,350 --> 00:01:23,150

OH I DON'T KNOW THAT ONE.

26

00:01:23,150 --> 00:01:25,759

SHAKING MY HEAD, TOM.

27

00:01:25,759 --> 00:01:26,759

DOH.

28

00:01:26,759 --> 00:01:30,409

WELL, WE CAUGHT UP WITH THE TEAM AS THEY WERE
PREPPING GEAR AND GETTING READY FOR OUR FIRST

29

00:01:30,409 --> 00:01:31,409

EXPEDITION.

30

00:01:31,409 --> 00:01:35,039

LET'S HEAR FROM THE OMG TEAM; THEMSELVES
-- PRE MISSION -- AS THEY PREPPED THE GIII

31

00:01:35,039 --> 00:01:38,310

AIRCRAFT AND THE TEAM PREPARES FOR THIS IMPORTANT
MISSION.

32

00:01:38,310 --> 00:01:40,189

WE'LL B-R-B AFTER OMG....

33

00:01:40,189 --> 00:01:41,560

ROLL THE TAPE.

34

00:01:41,560 --> 00:01:42,560

[MUSIC]

35

00:01:42,560 --> 00:01:44,630

OMG, OH MY GOODNESS RIGHT?

36

00:01:44,630 --> 00:01:45,630

NOT ANYMORE.

37

00:01:45,630 --> 00:01:49,869

OMG STANDS FOR OCEANS MELTING GREENLAND.

38

00:01:49,869 --> 00:01:54,460

IT TOOK DOZENS OF PEOPLE TO GET THIS MISSION
TO WHERE IT IS TODAY.

39

00:01:54,460 --> 00:01:59,609

WE HAVE ABOUT TEN PEOPLE ON THE SCIENCE TEAM,
WHO HELP WRITE THE PROPOSAL, PLAN ALL THE

40

00:01:59,609 --> 00:02:06,060

SCIENCE, BUT THEN THERE'S DOZENS MORE WHO
WORKED ON THE ACTUAL INSTRUMENT, PILOTS, A

41

00:02:06,060 --> 00:02:08,860

PROJECT MANAGER IN CHARGE OF ALL THAT STUFF.

42

00:02:08,860 --> 00:02:13,730

SO THERE'S A WHOLE LOT OF REALLY CAPABLE
PEOPLE WHO'VE DONE AMAZING WORK TO GET US

43

00:02:13,730 --> 00:02:16,170

TO WHERE WE ARE TODAY.

44

00:02:16,170 --> 00:02:18,310

[SCREW GUN]

45

00:02:18,310 --> 00:02:27,630

OMG IS A VERY EXCITING MISSION, THAT HOPES
TO ANSWER THE QUESTION; IS THE WARMING OCEAN

46

00:02:27,630 --> 00:02:36,510

INVOLVED IN THE RECENT OBSERVED MELTING OF

MANY OF GREENLAND'S GLACIERS.

47

00:02:36,510 --> 00:02:47,450

WE ARE USING THE GLISTIN RADAR TO MAP A VERY,
VERY HIGH RESOLUTION THE SURFACE OF ALMOST

48

00:02:47,450 --> 00:02:50,870

ALL OF THE GLACIERS THAT END IN THE OCEAN
AROUND GREENLAND.

49

00:02:50,870 --> 00:02:57,260

SO THE RADAR WILL TELL US HOW TALL AND WHAT
THE EXTENT OF THE MARINE TERMINATING GLACIERS

50

00:02:57,260 --> 00:03:01,710

AROUND GREENLAND ARE AND WE'LL LOOK FOR
CHANGES IN THAT OVER TIME.

51

00:03:01,710 --> 00:03:11,180

IT WILL BE AN AMAZING OPPORTUNITY TO COLLECT
THESE DATA OVER MANY YEARS, WHEN YOU HAVE

52

00:03:11,180 --> 00:03:18,560

BOTH SIDES OF THIS RELATIONSHIP BEING MONITORED
AT THE SAME TIME AND THIS TO MY KNOWLEDGE

53

00:03:18,560 --> 00:03:23,810

AS NEVER HAPPENED BEFORE ON THE SAME SCALE
BOTH IN TIME AND SPACE.

54

00:03:23,810 --> 00:03:32,290

AT THE END OF OMG I THINK WE'LL GET A MUCH
BETTER UNDERSTANDING OF THE RELATIONSHIP BETWEEN

55

00:03:32,290 --> 00:03:42,600

THE OCEAN AND THE ICE SHEET AND SPECIFICALLY
HOW AND WHERE A WARMING OCEAN IS GOING TO

56

00:03:42,600 --> 00:03:52,180

ACCELERATE MELTING OF GREENLAND AND AS A CONSEQUENCE

THE RISING OF GLOBAL SEA LEVELS.

57

00:03:52,180 --> 00:03:53,640

[AIRPLANE]

58

00:03:53,640 --> 00:03:59,600

THAT WAS REALLY COOL I DIDN'T REALIZE HOW
MUCH PREPARATION GOES INTO THESE THINGS.

59

00:03:59,600 --> 00:04:01,650

YEAH IT'S A TOUGH ROAD FOR THE SCIENTIST.

60

00:04:01,650 --> 00:04:04,800

NOT ONLY DO THEY HAVE TO GET THE INSTRUMENTS
TOGETHER AND MAKE SURE THEY ARE WORKING, THEY

61

00:04:04,800 --> 00:04:08,540

HAVE TO PLAN THOUSANDS OF MILES OF FLIGHT
LINES, LIKE LITERALLY PICK WHERE THE PLANE

62

00:04:08,540 --> 00:04:09,540

IS GOING TO GO.

63

00:04:09,540 --> 00:04:10,540

THAT'S CRAZY!

64

00:04:10,540 --> 00:04:15,650

SO WHAT ARE WE LOOKING AT HERE, SO THIS IS
NASA GIII AIRPLANE OUT AT PALMDALE, CALIFORNIA

65

00:04:15,650 --> 00:04:18,359

COORDINATED BY ARMSTRONG RESEARCH CENTER,
RIGHT?

66

00:04:18,359 --> 00:04:22,810

RIGHT, ALONG WITH JOHNSON SPACE CENTER IN
HOUSTON AND ALSO NASA'S JET PROPULSION LAB

67

00:04:22,810 --> 00:04:24,150

WHICH IS WHERE THE SCIENTIST ARE FROM.

68

00:04:24,150 --> 00:04:28,770

WHAT A LOT OF PEOPLE DON'T REALIZE YOU HEAR
GIII, THIS IS A STANDARD BUSINESS JET BUT

69

00:04:28,770 --> 00:04:32,780

IT'S SPECIAL FOR NASA, IT'S GOT HOLES
IN IT WHERE INSTRUMENTS CAN GO THROUGH AND

70

00:04:32,780 --> 00:04:35,320

ALL KINDS OF FANCY HIGH TECH GEAR INSIDE.

71

00:04:35,320 --> 00:04:41,340

YEAH HERE'S A SHOT OF THE INSIDE, HERE THE
SCIENTIST JOSH WILLIS RIGHT BY THE PILOTS

72

00:04:41,340 --> 00:04:44,300

AND YOU CAN SEE ALL THE GEAR GOING BACK INSIDE
OF IT.

73

00:04:44,300 --> 00:04:49,749

SO WE HAVE THE SCIENTIST AND THE PILOTS, WHAT
ARE THE OTHER TYPES OF PEOPLE INVOLVED IN

74

00:04:49,749 --> 00:04:50,749

THIS PROJECT.

75

00:04:50,749 --> 00:04:54,380

SO THESE INSTRUMENTS USUALLY REQUIRE PEOPLE
TO ADJUST THEM WHILE THEY'RE FLYING, BECAUSE

76

00:04:54,380 --> 00:04:58,659

THE THING THAT YOU'RE TRYING TO MEASURE
IS CHANGING, YOU LIKE IT'S A RADAR SO YOU

77

00:04:58,659 --> 00:05:01,199

CHANGE LIKE THE POWER OF THE RADAR WHILE YOU'RE
GOING.

78

00:05:01,199 --> 00:05:05,719

SO THIS IS COOL, THIS IS ACTUALLY THE RADAR
RIGHT HERE, UNDERNEATH THE AIRPLANE.

79

00:05:05,719 --> 00:05:09,659

YEAH AND IT'S HARD TO BELIEVE, HERE'S
THAT THING THAT'S GOING TO FLY OVER THE

80

00:05:09,659 --> 00:05:13,650

ICE, THOUSANDS OF FEET IN THE AIR AND IT'S
GOING TO SHOOT RADAR SIGNALS DOWN.

81

00:05:13,650 --> 00:05:17,900

THE INSTRUMENT, THE GLISTIN INSTRUMENT IS
ACTUALLY SHOOTING DOWN RADAR WAVES TO THE

82

00:05:17,900 --> 00:05:24,650

GLACIERS AND THEN IT WAITS FOR THE RETURN
SIGNAL TO COME BACK UP WITH OTHER RADAR WAVES

83

00:05:24,650 --> 00:05:27,810

AND THE AIRCRAFT WILL BE FLYING OVER AND WILL
CAPTURE THOSE SIGNALS.

84

00:05:27,810 --> 00:05:32,219

I KNOW AND I ALWAYS FIND THIS HARD TO BELIEVE
YOU CAN ACTUALLY MEASURE THE TIMING OF ALL

85

00:05:32,219 --> 00:05:37,290

OF THIS, THE SPEED AT WHICH THE RADAR PROPAGATES,
SO YOU CAN FIGURE OUT HOW HIGH THE GROUND

86

00:05:37,290 --> 00:05:38,520

IS UNDERNEATH THE PLANE.

87

00:05:38,520 --> 00:05:41,550

ISN'T THERE A COOL STORY OF HOW THE RADAR
WAS DEVELOPED?

88

00:05:41,550 --> 00:05:46,039

YEAH IT STARTED OUT IT WAS CALLED UAVSAR AND
THEY WERE BUILDING IT TO LITERALLY RECREATE

89

00:05:46,039 --> 00:05:50,370

WHAT WE SEE ON RADAR SATELLITES ON A PLANE,
BUT THERE WAS AN ENGINEER ON THE PROJECT AT

90

00:05:50,370 --> 00:05:54,840

JPL, HER NAME'S DELWYN MOLLER AND SHE HAD
THE IDEA WITH JUST SOME SMALL TWEAKS TO THAT

91

00:05:54,840 --> 00:05:58,860

RADAR SHE COULD MAKE THE MOST PRECISE RADAR
MAPPING INSTRUMENT EVER MADE.

92

00:05:58,860 --> 00:06:03,849

AND WHAT'S AMAZING ABOUT IT, YOU GET VERY,
VERY PRECISE MEASUREMENTS OVER A VERY, VERY

93

00:06:03,849 --> 00:06:04,849

BROAD AREA.

94

00:06:04,849 --> 00:06:06,990

AND IT'S THE FIRST INSTRUMENT OF ITS KIND
THAT WAY.

95

00:06:06,990 --> 00:06:07,990

[AIRCRAFT COMMUNICATION]

96

00:06:07,990 --> 00:06:08,990

COOL.

97

00:06:08,990 --> 00:06:12,639

THE BIG THING ABOUT GLISTIN IS THAT IT'S
GOING TO BE THE FIRST VERY, VERY HIGH RESOLUTION

98

00:06:12,639 --> 00:06:16,009

MEASUREMENT ALL THE WAY AROUND GREENLAND.

99

00:06:16,009 --> 00:06:17,199

HUH.

100

00:06:17,199 --> 00:06:19,509

SO WHAT ARE WE EXPECTING TO SEE?

101

00:06:19,509 --> 00:06:21,979

WHAT ARE WE GOING TO SEE IN TERMS OF THE GREENLAND ICE SHEET.

102

00:06:21,979 --> 00:06:26,090

SO ONE OF THE IMPORTANT THINGS ABOUT OMG IS IT'S GOING TO CONNECT UP THE CHANGES IN

103

00:06:26,090 --> 00:06:28,919

THE OCEAN WITH THE CHANGES IN THE ICE.

104

00:06:28,919 --> 00:06:33,239

SO WE'RE LOSING A LOT OF ICE HERE ON EARTH, WHY IS THAT IMPORTANT TO STUDY?

105

00:06:33,239 --> 00:06:34,460

WHY IS THAT IMPORTANT TO KNOW?

106

00:06:34,460 --> 00:06:35,900

THERE'S TWO BIG THINGS.

107

00:06:35,900 --> 00:06:40,310

NUMBER ONE YOU CAN THINK OF ICE LIKE A BIG-MIRRORED HAT ON TOP OF THE PLANET AND SO WHEN SUNLIGHT

108

00:06:40,310 --> 00:06:43,659

COMES IN, IT GETS REFLECTED OFF THAT HAT AND KEEPS OUR HEAD COOL.

109

00:06:43,659 --> 00:06:48,780

TAKE THAT MIRRORED HAT OFF, SUN HITS YOUR HEAD AND YOU GET HOTTER AND YOU LOOSE ICE

110

00:06:48,780 --> 00:06:49,780

AND SNOW.

111

00:06:49,780 --> 00:06:53,479

THERE'S ONE OTHER THING AND IT'S SPECIAL
ABOUT GREENLAND, WHERE YOU HAVE ICE UP ON

112

00:06:53,479 --> 00:06:59,900

A CONTINENT OR UP ON LAND, WHEN WE LOSE THAT
ICE WE TRANSFER WATER AND ICE INTO THE OCEAN

113

00:06:59,900 --> 00:07:02,249

AND THAT RAISES SEA LEVEL.

114

00:07:02,249 --> 00:07:07,139

RIGHT NOW SEA LEVEL IS RISING ALL AROUND THE
WORLD BECAUSE WE'RE LOSING THAT LAND-BASED

115

00:07:07,139 --> 00:07:08,139

ICE.

116

00:07:08,139 --> 00:07:12,279

AND OMG IS TRYING TO UNDERSTAND WHY WE'RE
LOSING SO MUCH ICE FROM GREENLAND.

117

00:07:12,279 --> 00:07:17,199

INCREDIBLE THAT IT'S ALL ORIGINATING FROM
THIS ONE PLACE, IT JUST KINDA SHOWS THE INTERCONNECTEDNESS

118

00:07:17,199 --> 00:07:18,210

OF OUR EARTH SYSTEMS.

119

00:07:18,210 --> 00:07:23,189

OH YEAH, AND ONE OF THE THINGS ABOUT NASA
IS THAT WE STUDY THE EARTH AS A SYSTEM, AND

120

00:07:23,189 --> 00:07:27,930

IF YOU WANT TO UNDERSTAND LIKE WHY IT'S
GETTING HOT IN ONE PART OF THE EARTH AND HOW

121

00:07:27,930 --> 00:07:32,629

THAT RELATES TO CHANGES TO CLOUD COVER AND THINGS, YOU NEED THAT KIND OF SATELLITE PERSPECTIVE

122

00:07:32,629 --> 00:07:37,280

BUT YOU ALSO NEED TO GET DOWN INTO THE "DIRT" OR INTO THE ICE IN THIS CASE.

123

00:07:37,280 --> 00:07:40,039

AND THAT'S WHERE THE OCEANS MELTING GREENLAND TEAM COMES IN.

124

00:07:40,039 --> 00:07:43,259

THAT'S RIGHT AND WE'VE GOT AIRCRAFT AND RESEARCH VESSELS ON THE CASE, OFF THE COAST

125

00:07:43,259 --> 00:07:44,259

OF GREENLAND.

126

00:07:44,259 --> 00:07:46,680

MAKING OBSERVATIONS IN THE WATER AND IN THE AIR.

127

00:07:46,680 --> 00:07:51,759

FOR THE FIRST LEG OF OMG THIS YEAR IS GREENLAND FOR GLACIER MAPPING, USING NASA'S GIII.

128

00:07:51,759 --> 00:07:56,460

LATER IN THE YEAR WE'RE USING THESE DROPSONDES FOR OCEAN PROFILING, BUT WE'LL TALK ABOUT

129

00:07:56,460 --> 00:07:58,680

MORE OF THAT LATER.

130

00:07:58,680 --> 00:08:03,330

LET'S TAKE A LOOK AT WHAT THE TEAM HAS DONE OFF THE COAST OF GREENLAND AND ICELAND.

131

00:08:03,330 --> 00:08:04,330
[MUSIC]

132
00:08:04,330 --> 00:08:05,780
[AIRPLANE NOISE]

133
00:08:05,780 --> 00:08:08,279
YEAH THIS IS ON

134
00:08:08,279 --> 00:08:13,410
TEST 1 2 3 4 SIBILANCE, SIBILANCE.

135
00:08:13,410 --> 00:08:19,710
PILOT TO CO-PILOT, PILOT TO CO-PILOT COME
IN PLEASE.

136
00:08:19,710 --> 00:08:24,349
IT'S RIGHT CLEAR GO.

137
00:08:24,349 --> 00:08:25,509
[LAUGHTER]

138
00:08:25,509 --> 00:08:30,150
ALL RIGHT TEST COMPLETE

139
00:08:30,150 --> 00:08:31,310
[MUSIC]

140
00:08:31,310 --> 00:08:39,659
OK WE'RE IN KEFLAVIK THIS IS DAY NUMBER
FIVE, OF OUR OMG DEPLOYMENT FIRST YEAR OF

141
00:08:39,659 --> 00:08:43,880
THE OMG DEPLOYMENT AND SO FAR WE'VE COLLECTED
2.2TB OF DATA.

142
00:08:43,880 --> 00:08:47,460
AND TODAY WE'RE GOING BACK TO GREENLAND
AND WE'RE GOING TO IMAGE MORE OF THE GLACIERS.

143
00:08:47,460 --> 00:08:54,089
SOMETIMES YOU'LL SEE THIS PITCH INDICATOR
AND KIND OF ROLL THE AIRPLANE, YOU ROLL OR

144
00:08:54,089 --> 00:08:58,860
PITCH OR DIVE SOMEHOW IT WILL BE A REAL QUICK
MOMENTARY EXCURSION.

145
00:08:58,860 --> 00:09:07,260
SO JOSH WHAT CAN YOU TELL US ABOUT THIS OCEANS
MELTING GREENLAND CAMPAIGN, WHAT WE'RE DOING

146
00:09:07,260 --> 00:09:08,310
UP HERE?

147
00:09:08,310 --> 00:09:12,490
WELL WE'RE BASICALLY FLYING OVER GREENLAND
AND MEASURING HOW TALL THE GLACIERS ARE.

148
00:09:12,490 --> 00:09:17,630
THERE'S A LOT OF THE TIME WHERE IT'S UNDERCAST
AND IT'S JUST LOW CLOUDS AND YOU COULD BE

149
00:09:17,630 --> 00:09:22,890
OVER ARIZONA OR ANYWHERE ELSE AND IT JUST
DOESN'T LOOK ANY DIFFERENT IT'S JUST CLOUDS.

150
00:09:22,890 --> 00:09:28,070
THEN OTHER TIMES IT'S CLEAR BELOW AND YOU
SEE TO THE GROUND, IT'S JUST BREATHTAKINGLY

151
00:09:28,070 --> 00:09:31,370
BEAUTIFUL, EXTREMELY ROUGH TERRAIN.

152
00:09:31,370 --> 00:09:38,580
AND LOTS OF SNOW AND ICE, LOTS OF MOUNTAINS
IT'S REALLY VERY IMPRESSIVE.

153

00:09:38,580 --> 00:09:39,600

[MUSIC]

154

00:09:39,600 --> 00:09:45,170

AND WHAT IS A GLACIER?

155

00:09:45,170 --> 00:09:52,610

A GLACIER IS BASICALLY A BIG RIVER OF MOVING
ICE WHICH CARRIES ICE OFF THE ICE SHEET AND

156

00:09:52,610 --> 00:09:55,420

INTO THE OCEAN.

157

00:09:55,420 --> 00:10:00,440

ACTUALLY NOT EVERY GLACIER ENDS IN THE OCEAN
MOST OF THE ONES IN GREENLAND DO, AND THAT'S

158

00:10:00,440 --> 00:10:04,810

PART OF THE REASON WHY WE'RE SO INTERESTED
IN WHETHER THE OCEANS ARE MELTING AWAY THE

159

00:10:04,810 --> 00:10:11,899

EDGES OF THE GLACIERS AND GRATING THE ICE
SHEET.

160

00:10:11,899 --> 00:10:12,899

[MUSIC]

161

00:10:12,899 --> 00:10:17,949

TODAY WAS REALLY EXCITING BECAUSE WE FLEW
OVER A PAIR OF GLACIERS THAT ACTUALLY RUN

162

00:10:17,949 --> 00:10:24,070

FROM THE NORTH AND SOUTH THAT COLLIDE IN A
HUGE RIDGE, BEFORE BREAKING OFF INTO ICEBERGS

163

00:10:24,070 --> 00:10:28,810

AND FILLING UP WITH FJORD FULL OF CHUNKS OF
GIANT ICE.

164
00:10:28,810 --> 00:10:34,900
IT'S INCREDIBLY DRAMATIC TO SEE AND INCREDIBLY
IMPORTANT GLACIER AND GLACIER SYSTEM BECAUSE

165
00:10:34,900 --> 00:10:38,200
IT DRAINS HUGE AMOUNT OF ICE FROM THE ICE
SHEET.

166
00:10:38,200 --> 00:10:40,029
VERY NICE, VERY NICE.

167
00:10:40,029 --> 00:10:43,380
WELL THAT'S IMPORTANT SCIENCE AND THE TEAM
IS DOING IT RIGHT.

168
00:10:43,380 --> 00:10:47,420
THIS IS ALL VERY COOL AND I'M SO EXCITED
ABOUT SEEING EARTH EXPEDITIONS IN ACTION,

169
00:10:47,420 --> 00:10:51,790
IN THE FIELD, BUT I WANTED TO SEE WHAT YOUR
REACTIONS WERE TO ALL THIS...SO I WENT OUT

170
00:10:51,790 --> 00:10:54,970
AND ASKED YOU GUYS SOME QUESTIONS:

171
00:10:54,970 --> 00:10:55,970
[MUSIC]

172
00:10:55,970 --> 00:10:59,250
WHAT PLANET IN OUR SOLAR SYSTEM DOES NASA
STUDY THE MOST?

173
00:11:01,250 --> 00:11:00,250
MARS.

174
00:11:01,250 --> 00:11:03,880
I HAVE ABSOLUTELY NO IDEA.

175
00:11:03,880 --> 00:11:04,880
MARS.

176
00:11:04,880 --> 00:11:09,373
PLUTO, CAUSE THEY DON'T KNOW IF IT'S A
PLANET OR NOT.

177
00:11:11,373 --> 00:11:10,373
MARS.

178
00:11:14,373 --> 00:11:12,373
MARS?

179
00:11:14,373 --> 00:11:15,373
NO.

180
00:11:15,373 --> 00:11:16,373
KIND OF.

181
00:11:16,373 --> 00:11:17,373
THIS ONE, EARTH.

182
00:11:17,373 --> 00:11:19,180
THIS ONE, EARTH IS CORRECT!

183
00:11:19,180 --> 00:11:20,180
EARTH?

184
00:11:20,180 --> 00:11:21,209
EARTH, YES!

185
00:11:21,209 --> 00:11:22,209
EARTH?

186
00:11:22,209 --> 00:11:23,209
[MUSIC]

187

00:11:23,209 --> 00:11:24,829
BY LIKE SENDING PEOPLE OUT INTO SPACE, I GUESS.

188
00:11:24,829 --> 00:11:25,829
A BOAT?

189
00:11:25,829 --> 00:11:29,470
YES SO WE USE BOATS, DO YOU HAVE ANY PETS?

190
00:11:29,470 --> 00:11:30,470
YEAH.

191
00:11:30,470 --> 00:11:31,690
WHAT PET DO YOU HAVE?

192
00:11:31,690 --> 00:11:32,690
A DOG.

193
00:11:32,690 --> 00:11:37,259
SO WE ACTUALLY USE DOGSLEDS IN SOME AREAS
TOO, ISN'T THAT COOL!

194
00:11:39,500 --> 00:11:38,380
SATELLITES.

195
00:11:39,500 --> 00:11:41,740
YEAH SATELLITES!

196
00:11:41,740 --> 00:11:46,180
STUDYING THE SOIL AND THE ATMOSPHERE WITH
SCIENTIFIC INSTRUMENTS.

197
00:11:46,180 --> 00:11:47,300
I DON'T KNOW.

198
00:11:47,300 --> 00:11:48,300
A THERMOMETER?

199

00:11:48,300 --> 00:11:50,290
I DON'T KNOW, KINDA EXPLORING IT?

200
00:11:50,290 --> 00:11:53,760
LIKE EXPLORING THE OCEAN, EXPLORING THE UNKNOWN
OF EARTH.

201
00:11:53,760 --> 00:11:54,760
MMM.

202
00:11:56,760 --> 00:11:55,760
RADAR.

203
00:11:56,760 --> 00:12:01,470
HOW DO YOU THINK STUDYING OUR EARTH IS IMPORTANT?

204
00:12:01,470 --> 00:12:05,649
BECAUSE WE LIVE ON IT AND WE HAVE TO MAKE
IT SUSTAINABLE AND IF WE'RE NOT DOING THAT,

205
00:12:05,649 --> 00:12:06,649
WHAT ARE WE DOING?

206
00:12:06,649 --> 00:12:09,759
AND THE EARTH GIVES SO MUCH TO US WHY WOULDN'T
WE GIVE BACK?

207
00:12:09,759 --> 00:12:16,519
CAUSE I THINK IT'S VERY IMPORTANT WITH THE
ENVIRONMENT AND THE CHANGES THAT GO ON WITH

208
00:12:16,519 --> 00:12:20,660
IT.

209
00:12:20,660 --> 00:12:23,829
I THINK THE SEASONS ARE CHANGING, LIKE THE
TIME OF YEAR DEFINITELY CHANGED.

210
00:12:23,829 --> 00:12:29,730

I THINK IT'S BEEN HAPPENING FOR A REALLY
LONG TIME AND NO ONE REALLY TALKS ABOUT IT,

211

00:12:29,730 --> 00:12:31,240

I THINK IT'S FRIGHTENING.

212

00:12:31,240 --> 00:12:39,980

LIKE IN SOME SOLD PLACES LIKE THEY CAN, IT
MAKES THINGS HOT.

213

00:12:39,980 --> 00:12:44,029

I LIVE ON AN ISLAND SO, YES, VERY MUCH SO.

214

00:12:44,029 --> 00:12:45,029

[LAUGHTER]

215

00:12:45,029 --> 00:12:51,509

IT'S SOME WE AS HUMAN BEINGS EFFECT AND
IF PEOPLE DON'T THINK ABOUT THAT AT ALL

216

00:12:51,509 --> 00:12:59,080

IT'S PROBLEMATIC IF WE WANT TO CONTINUE
LIVING LIKE WE DO WE NEED TO MAKE CHANGES.

217

00:12:59,080 --> 00:13:03,190

IT EFFECTS POPULATION AND ENVIRONMENT

218

00:13:03,190 --> 00:13:09,290

YOU SEE THAT THE WEATHER PATTERN IS CHANGING,
WE HAD LIKE A FIXED DURATION, WHERE IN WE

219

00:13:09,290 --> 00:13:14,100

HAD WINTER AND NOW I SEE THAT IT'S MOVING
AND IT'S STILL COLD, IT'S SUPPOSED TO

220

00:13:14,100 --> 00:13:15,690

BE PROPER SPRING.

221

00:13:15,690 --> 00:13:21,139

BECAUSE I THINK WE ARE DOING THINGS THAT ARE DAMAGING TO THE CLIMATE.

222
00:13:21,139 --> 00:13:26,300
BECAUSE I THINK THERE'S EVIDENCE THAT OVER TIME WE HAVE, EXACTLY WE HAVE DONE DAMAGE

223
00:13:26,300 --> 00:13:29,850
THINGS THAT ARE NOT NECESSARILY REVERSIBLE AT THIS TIME.

224
00:13:29,850 --> 00:13:32,120
EARTH IS DEFINITELY MY FAVORITE PLANET!

225
00:13:32,120 --> 00:13:35,190
WHERE ELSE ARE YOU GOING TO FIND COOL PEOPLE LIKE THAT?

226
00:13:35,190 --> 00:13:36,879
EARTH IS DEFINITELY MY FAVORITE PLANET, TOO.

227
00:13:36,879 --> 00:13:40,770
AND IF YOU WANT TO FOLLOW ALONG ONLINE, TWEET US AT HASHTAG-EARTH-EXPEDITION OR CHECK OUT

228
00:13:40,770 --> 00:13:41,790
OUR FACEBOOK PAGE.

229
00:13:41,790 --> 00:13:44,529
SO TOM, WHY IS EARTH YOUR FAVORITE PLANET?

230
00:13:44,529 --> 00:13:46,839
IT JUST KEEPS ME GROUNDED.

231
00:13:46,839 --> 00:13:52,870
WELL PLUTO IS MY FAVORITE DWARF PLANET; CAUSE IT'S JUST PRETTY FAR OUT.

232
00:13:52,870 --> 00:13:55,110

WHAT ABOUT OUR CLOSEST NEIGHBOR THE PLANET VENUS?

233

00:13:55,110 --> 00:13:57,029

I DON'T LIKE TALKING ABOUT VENUS.

234

00:13:57,029 --> 00:14:00,279

IT'S JUST A LITTLE TOO CLOSE TO HOME.

235

00:14:00,279 --> 00:14:02,020

TRUE BUT THERE'S NO PLACE LIKE HOME.

236

00:14:02,020 --> 00:14:03,399

ALSO, EARTH HAS NETFLIX.

237

00:14:03,399 --> 00:14:07,851

RIGHT, BUT I FEEL LIKE STREAMING VIDEO AT PLUTO WOULD JUST TAKE SO MUCH TIME AND HAVE

238

00:14:07,851 --> 00:14:08,851

SO MUCH LAG!

239

00:14:08,851 --> 00:14:09,851

OK.

240

00:14:09,851 --> 00:14:10,851

THAT'S ENOUGH.

241

00:14:10,851 --> 00:14:11,851

THAT MEANS I WON THIS PUN CHALLENGE.

242

00:14:11,851 --> 00:14:16,190

LET'S RETURN TO EARTH, AND ON EARTH AT NASA'S LANGLEY RESEARCH CENTER IN VIRGINIA IS JIM

243

00:14:16,190 --> 00:14:21,079

CRAWFORD WORKING ON OUR NEXT EARTH EXPEDITION: THE KOREA U.S.-AIR QUALITY MISSION OR AS WE

244

00:14:21,079 --> 00:14:23,010

CALL IT KORUS AQ.

245

00:14:23,010 --> 00:14:26,069

– I GOT TO SIT DOWN AND CHAT WITH JIM ALL ABOUT THIS IMPORTANT AIR QUALITY MISSION.

246

00:14:26,069 --> 00:14:27,069

[MUSIC]

247

00:14:27,069 --> 00:14:30,009

SO JIM, WHAT'S THE MOST IMPORTANT THING YOU HOPE TO ACCOMPLISH WITH KORUS-AQ?

248

00:14:30,009 --> 00:14:34,920

WHEN THE KORUS-AQ FLIGHTS ARE FINISHED WE REALLY HOPE TO HAVE A DATA SET THAT WILL SHOW

249

00:14:34,920 --> 00:14:39,560

THE DISTRIBUTIONS OF POLLUTION OVER EAST ASIA, THAT WILL TEST CURRENT MODELS AND CURRENT

250

00:14:39,560 --> 00:14:43,370

SATELLITE ALGORITHMS TO MAKE SURE WE CAN FIND THE IMPROVEMENTS THAT WE NEED TO IMPROVE OUR

251

00:14:43,370 --> 00:14:45,220

ABILITY TO MONITOR AIR QUALITY

252

00:14:45,220 --> 00:14:49,569

WELL TO FLY THREE AIRCRAFT OVER THE KOREAN PENINSULA IS NOT AN EASY TASK AND SO THERE

253

00:14:49,569 --> 00:14:53,839

IS STILL A LOT OF COORDINATION TO MAKE SURE THAT WE CAN FIND THE RIGHT FLIGHT PERMISSIONS,

254

00:14:53,839 --> 00:14:56,360

RIGHT FLIGHT PROFILES TO GATHER THE DATA THAT

WE NEED.

255
00:14:56,360 --> 00:14:59,290
AND HOW'S THE PLANNING GOING FOR THIS MISSION,
THIS IS A BIG ONE?

256
00:14:59,290 --> 00:15:03,350
PROBABLY THE MOST COMPLEX MISSION WE'VE
EVER DONE, WE HAVE OVER TWENTY INSTRUMENTS

257
00:15:03,350 --> 00:15:07,860
ON THE PLANE FROM THE US, AND AN ADDITIONAL
FIVE INSTRUMENTS FROM THE KOREAN INVESTIGATORS,

258
00:15:07,860 --> 00:15:11,230
SO WE'VE NEVER HAD THAT QUITE OF AN INTERNATIONAL
MIX ON THE PLANE BEFORE.

259
00:15:11,230 --> 00:15:16,490
ALSO THREE PLANES IN THE AIR WITH A LOT OF
GROUND SENSORS MAKES THIS A VERY COMPLEX EXPERIMENT.

260
00:15:16,490 --> 00:15:19,269
WHAT REALLY EXCITES YOU ABOUT THIS MISSION?

261
00:15:19,269 --> 00:15:23,329
WHAT REALLY EXCITES ME ABOUT THE MISSION IS
THAT WE'RE LOOKING A FUTURE WHERE SATELLITES

262
00:15:23,329 --> 00:15:28,480
WILL BE USED ACROSS THE ENTIRE NORTHERN HEMISPHERE
IN A COOPERATIVE FASHION TO LOOK AT AIR QUALITY,

263
00:15:28,480 --> 00:15:32,529
THIS EXPERIMENT IS OUR FIRST CHANCE TO WORK
WITH OUR KOREAN COLLEAGUES TO MAKE THAT A

264
00:15:32,529 --> 00:15:33,529
REALITY.

265
00:15:33,529 --> 00:15:34,810
I'M READY FOR ALL THIS GREAT SCIENCE TO
COME IN.

266
00:15:34,810 --> 00:15:36,110
THANKS FOR THE UPDATE JIM.

267
00:15:36,110 --> 00:15:37,110
THANK YOU.

268
00:15:37,110 --> 00:15:39,730
WE'LL HAVE MORE ON KORUS-AQ COMING TO YOU
SOON.

269
00:15:39,730 --> 00:15:40,730
NEXT UP.

270
00:15:40,730 --> 00:15:45,870
WE LEARN A LITTLE ABOUT NASA'S FLYING LABORATORY
THE DC-8, WHICH PLAYS A BIG ROLE IN TWO EARTH

271
00:15:45,870 --> 00:15:47,870
EXPEDITIONS THIS YEAR, INCLUDING KORUS-AQ.

272
00:15:47,870 --> 00:15:59,740
NASA'S DC-8 IS A JETLINER THAT HAS BEEN
HIGHLY MODIFIED TO SUPPORT

273
00:15:59,740 --> 00:16:02,560
THE AGENCY'S AIRBORNE SCIENCE PROGRAM.

274
00:16:02,560 --> 00:16:05,040
BUILT IN 1969, THE AIRCRAFT IS

275
00:16:05,040 --> 00:16:08,129
CURRENTLY BASED AT THE NASA ARMSTRONG FLIGHT
RESEARCH CENTER

276

00:16:08,129 --> 00:16:12,910
HANGAR 703 IN PALMDALE, CALIFORNIA, AND IS
ONE OF FEW DC-8'S STILL

277
00:16:12,910 --> 00:16:16,680
OPERATING IN THE WORLD.

278
00:16:16,680 --> 00:16:22,959
THE DC-8 IS OUTFITTED WITH SPECIALIZED OPTICAL
WINDOWS, PROBE PORTS,

279
00:16:22,959 --> 00:16:28,730
AND ELECTRONIC MODIFICATIONS TO SUPPORT A
WIDE ARRAY OF SCIENTIFIC

280
00:16:28,730 --> 00:16:29,730
INSTRUMENTS.

281
00:16:29,730 --> 00:16:32,510
THESE ASSETS COMBINED WITH ITS LONG-DURATION
FLIGHT

282
00:16:32,510 --> 00:16:36,720
CAPABILITY, LARGE PAYLOAD CAPACITY AND LABORATORY
ENVIRONMENT MAKE

283
00:16:36,720 --> 00:16:39,959
IT ONE OF THE PREMIER RESEARCH AIRCRAFT AVAILABLE
FOR NASA'S SCIENCE

284
00:16:39,959 --> 00:16:42,259
MISSION DIRECTORATE.

285
00:16:42,259 --> 00:16:45,290
DATA GATHERED WITH THE AIRCRAFT HAVE BEEN
USED FOR A VARIETY OF EARTH

286
00:16:45,290 --> 00:16:50,949
SCIENCE STUDY APPLICATIONS INCLUDING ECOLOGY,
GEOGRAPHY, HYDROLOGY,

287

00:16:50,949 --> 00:16:56,269

METEOROLOGY, OCEANOGRAPHY, VOLCANOLOGY, ATMOSPHERIC
CHEMISTRY,

288

00:16:56,269 --> 00:17:01,000

CRYOSPHERIC SCIENCE, SOIL SCIENCE AND BIOLOGY.

289

00:17:01,000 --> 00:17:05,610

TOM, IT'S JUST INCREDIBLE HOW ADAPTABLE
THE DC-8 IS!!

290

00:17:05,610 --> 00:17:11,110

YEAH NASA AIRCRAFT ARE REALLY AT THE CUTTING
EDGE OF SCIENCE AND ENGINEERING, FROM THE

291

00:17:11,110 --> 00:17:18,480

SMALLER G-III MAPPING GREENLAND TO THE GIANT
DC-8 THAT'LL BE WORKING ON THE AIR QUALITY

292

00:17:18,480 --> 00:17:19,589

MISSION ABOVE SOUTH KOREA.

293

00:17:19,589 --> 00:17:24,870

AND HOW MONUMENTAL OMG AND KORUS AQ ARE GOING
TO BE FOR UNDERSTANDING HOW OUR PLANET WORKS!

294

00:17:24,870 --> 00:17:29,340

AND THAT'S JUST 2 OF OUR MISSIONS – THERE
ARE 8 ALL OVER THE WORLD THIS YEAR!

295

00:17:29,340 --> 00:17:30,340

THAT'S SO COOL!

296

00:17:30,340 --> 00:17:31,340

WHAT ARE YOU DOING?

297

00:17:31,340 --> 00:17:33,299

I'M TWEETING ABOUT IT RIGHT NOW.

298
00:17:33,299 --> 00:17:38,200
I'M EXCITED ABOUT HOW OMG IS GOING TO BE
A NEW BASE LAYER FOR UNDERSTANDING GLACIERS

299
00:17:38,200 --> 00:17:39,929
FOR DECADES TO COME.

300
00:17:39,929 --> 00:17:45,150
AFTER THIS FIELD CAMPAIGN, WE'LL KNOW HOW
BIG GLACIERS ARE AND HOW THEY'RE CHANGING.

301
00:17:45,150 --> 00:17:49,540
WHAT WE REALLY NEED TO UNDERSTAND IS THAT
CHANGE IS HAPPENING ALL OVER OUR PLANET AND

302
00:17:49,540 --> 00:17:51,700
NASA IS ON TOP OF IT.

303
00:17:51,700 --> 00:17:55,059
SO I THINK THAT'S A WRAP FOR NASA'S EARTH
EXPEDITIONS.

304
00:17:55,059 --> 00:17:56,620
KEEP TUNING IN FOR MORE INFORMATION.

305
00:17:56,620 --> 00:18:00,750
REMEMBER IT'S HASHTAG-EARTH-EXPEDITION ON
SOCIAL MEDIA, AND WE LOOK FORWARD TO SEEING