1
00:00:00,640 --> 00:00:03,960
[Music]

2
00:00:04,000 --> 00:00:10,420
>>During June 2017, a team of NASA and university scientists conducted the Convective Processes

3
00:00:10,420 --> 00:00:13,280
Experiment, also known as CPEX.

4
00:00:13,960 --> 00:00:18,400
Using a suite of instruments onboard NASA's DC-8 flying laboratory, scientists collected

5
00:00:18,400 --> 00:00:23,380
data on wind, temperature, and humidity around the subtropical waters of Florida.

6
00:00:23,580 --> 00:00:25,400
[Music]

7
00:00:25,740 --> 00:00:29,660
The campaign had two primary goals- to better understand the growth and decay of convective

8
00:00:29,660 --> 00:00:34,410
clouds, and to demonstrate wind measurement from space using a NASA wind lidar instrument,

9
00:00:34,410 --> 00:00:38,950
called DAWN, in anticipation of the European Space Agency's AEOLUS satellite, which is

10
00:00:38,950 --> 00:00:40,800
due for launch in 2018.

11
00:00:40,960 --> 00:00:48,300
>>The wind lidar is a laser beam, it doesn't diverge like a radar beam, so it's very small

12
00:00:48,300 --> 00:00:53,769
illumination volume, it's pointed downward,
in the case of the DC-8 here.

13
00:00:53,769 --> 00:01:00,519
So we're profiling below the aircraft, and
we achieve the wind measurements by looking

14
00:01:00,520 --> 00:01:03,460
at the winds from several different directions.

15
00:01:04,420 --> 00:01:08,410
>>Each day during the campaign, the science
team conducted weather briefings to determine

16
00:01:08,410 --> 00:01:12,230
if conditions were favorable for observing
convective activity and where their potential

17
00:01:12,230 --> 00:01:14,040
target locations would be.

18
00:01:14,040 --> 00:01:17,610
Once the team decided that weather conditions
were right, a preflight briefing was held

19
00:01:17,610 --> 00:01:22,080
to go over the mission objectives and the
flight path.

20
00:01:22,260 --> 00:01:27,260
[Music/Airplane Taking off]

21
00:01:27,560 --> 00:01:31,640
The CPEX team flew a total of sixteen science
flights over the course of the campaign, ranging

22
00:01:31,640 --> 00:01:33,860

from six to eight hours in duration.

23
00:01:33,860 --> 00:01:38,040
In addition to lidar, radar, and radiometer
instruments, the team also used dropsondes

24
00:01:38,040 --> 00:01:40,860
that collected data from inside the storm
or storm system being studied.

25
00:01:41,220 --> 00:01:43,720
>>Fire in the hole.

26
00:01:44,220 --> 00:01:48,500
[Music]

27
00:01:52,600 --> 00:01:54,800
>>Three...two...one...go!

28
00:01:54,940 --> 00:01:56,660
[Suction]

29
00:01:56,820 --> 00:02:02,450
>>This is called a dropsonde, where you have
an electronic weather station that falls ballistically

30
00:02:02,450 --> 00:02:06,280
from the plane; so you drop it out and it
falls and it transmits back its position,

31
00:02:06,280 --> 00:02:11,200
based on its GPS, and so we get the wind speed
and direction that way, and then it has very

32
00:02:11,200 --> 00:02:15,400
accurate sensors for temperature and humidity
and pressure and sea surface temperature,

33
00:02:15,400 --> 00:02:18,470

so right before it splashes, it gets the sea surface temperature.

34
00:02:18,470 --> 00:02:22,020
It's measuring about seven different things all at once, and when it hits the water, it's

35
00:02:22,020 --> 00:02:23,320
gone.

36
00:02:23,440 --> 00:02:25,140
[Music]

37
00:02:25,140 --> 00:02:29,000
>>Data collected from the CPEX mission will advance understanding of the atmosphere and

38
00:02:29,000 --> 00:02:32,320
help improve the accuracy of weather and climate models.

39
00:02:32,620 --> 00:02:36,760
[Music/Airplane Landing]