
IMPACTS
SMODE
DCOTSS
ACTIVATE
DELTA-X

1
00:00:01,030 --> 00:00:05,000
This year, five new missions are taking off to investigate

2
00:00:05,000 --> 00:00:09,000
our home planet. From coast to coast, these missions will take a closer look at everything

3
00:00:09,000 --> 00:00:13,030
from sea level rise to snowstorms, all based right here in the United States.

4
00:00:21,000 --> 00:00:25,030
About 200 miles off the coast of San Francisco, the Submesoscale Ocean Dynamics Experiment, or S-MODE,

5
00:00:25,030 --> 00:00:29,030
will use measurements from a research vessel and three planes –

6
00:00:29,030 --> 00:00:33,000
a King Air, a Gulfstream and a Twin Otter, to look at how

7
00:00:33,000 --> 00:00:37,030
swirling ocean eddies affect the movement of heat between the ocean

8
00:00:37,030 --> 00:00:41,000
and the atmosphere. Autonomous wave gliders

9
00:00:41,000 --> 00:00:45,030
and ocean gliders will dive below the surface of the water, to get a full picture

10
00:00:45,030 --> 00:00:49,000
of the ocean and atmosphere.

11
00:00:49,000 --> 00:00:53,000
Together, the mission will collect data about temperature, salinity

12
00:00:53,000 --> 00:00:57,030
and ocean velocity to get a better understanding of how small eddies

13
00:00:57,030 --> 00:01:01,030

affect the upper ocean.

14
00:01:05,030 --> 00:01:09,030
Traveling inland to the Midwest, the summer months can bring

15
00:01:09,030 --> 00:01:13,030
intense thunderstorms.

16
00:01:17,000 --> 00:01:21,000
Strong winds formed by these storms can overshoot the troposphere and reach

17
00:01:21,000 --> 00:01:25,000
higher in Earth’s atmosphere, injecting pollutants into the stratosphere,

18
00:01:25,000 --> 00:01:29,000
which can affect the ozone layer. Using an ER-2 plane flying

19
00:01:29,000 --> 00:01:33,030
up to 70,000 feet, the Dynamics and Chemistry of the Summer Stratosphere,

20
00:01:33,030 --> 00:01:37,000
or DCOTSS, mission will investigate how the pollutants

21
00:01:37,000 --> 00:01:41,030
reach the stratosphere and how their impact could change in the future.

22
00:01:49,030 --> 00:01:53,030
Farther south, the Mississippi River Delta is

23
00:01:53,030 --> 00:01:57,030
sinking as sea levels continue to rise globally.

24
00:02:01,030 --> 00:02:05,000
The Delta-X mission (no acronyms here)

25
00:02:05,000 --> 00:02:09,030
will combine measurements from two planes – a King Air and a Gulfstream –

26
00:02:09,030 --> 00:02:13,000
with measurements taken on the ground and in the water to study

27
00:02:13,000 --> 00:02:17,030
how and where soil is naturally transported and deposited by water.

28
00:02:25,000 --> 00:02:29,030
This can help researchers better understand how the coastal regions will be affected by

29
00:02:29,030 --> 00:02:33,030
rising sea levels.

30
00:02:45,000 --> 00:02:49,000
On the East Coast of the United States,

31
00:02:49,000 --> 00:02:53,000
the Aerosol Cloud Meteorology Interactions Over the Western Atlantic Experiment,

32
00:02:53,000 --> 00:02:57,030
or ACTIVATE, mission will look at how clouds in the marine boundary layer –

33
00:02:57,030 --> 00:03:01,030
roughly the 2 kilometers above the ocean – affect the water cycle.

34
00:03:01,030 --> 00:03:05,030
These cloud systems cover large stretches of the ocean

35
00:03:05,030 --> 00:03:09,000
and are not well-represented in climate models.

36
00:03:09,000 --> 00:03:13,000
ACTIVATE will use two planes – a Falcon and a King Air – to take measurements

37
00:03:13,000 --> 00:03:17,030
remotely and in situ, including releasing dropsondes through the clouds.

38
00:03:25,030 --> 00:03:29,000

Flying the same corridor,

39
00:03:29,000 --> 00:03:33,000
the Investigation of Microphysics and Precipitation for Atlantic Coast-Threatening Snowstorms,

40
00:03:33,000 --> 00:03:37,030
or IMPACTS, mission will use measurements

41
00:03:37,030 --> 00:03:41,000
on the ground, scientific balloons and two planes –

42
00:03:41,000 --> 00:03:45,000
the ER-2 and the P-3 – to measure snowstorms at all altitudes.

43
00:03:45,000 --> 00:03:49,030
IMPACTS is looking closely

44
00:03:49,030 --> 00:03:53,030
at the intense bands of snow that form inside clouds to improve forecasting