



1
00:00:00,050 --> 00:00:04,060
Silence

2
00:00:16,190 --> 00:00:08,080
Music

3
00:00:16,210 --> 00:00:20,230
Water is the fundamental ingredient for life on Earth.

4
00:00:20,250 --> 00:00:24,270
Looking at our Earth from space,

5
00:00:24,290 --> 00:00:28,300
with its vast and deep ocean, it appears as though

6
00:00:28,320 --> 00:00:32,340
there is an abundance of water for our use. However,

7
00:00:32,360 --> 00:00:36,400
only a small portion of Earth's water is accessible for our needs.

8
00:00:36,420 --> 00:00:40,470
How much fresh water exists and where it is stored

9
00:00:40,490 --> 00:00:44,570
affects us all. Nearly two-thirds of this fresh water

10
00:00:44,590 --> 00:00:48,660
is stored in the polar ice caps, snow packs, and glaciers,

11
00:00:48,680 --> 00:00:52,740
making it inaccessible for long periods of time.

12
00:01:04,990 --> 00:00:56,780
Music

13
00:01:05,010 --> 00:01:09,000

The water cycle is dynamic -

14

00:01:09,020 --> 00:01:13,060

it describes the continuous movement

15

00:01:13,080 --> 00:01:17,090

of water on, above and below the surface of the Earth

16

00:01:17,110 --> 00:01:21,100

and the transitions from one state to another.

17

00:01:21,120 --> 00:01:25,170

Music

18

00:01:25,190 --> 00:01:29,190

Sea surface temperature, surface winds, and air temperature

19

00:01:29,210 --> 00:01:33,270

influence the rate of evaporation at the ocean surface.

20

00:01:33,290 --> 00:01:37,290

In the tropics, warm ocean surface temperatures

21

00:01:37,310 --> 00:01:41,330

support high rates of evaporation.

22

00:01:41,350 --> 00:01:45,370

Wind also increases evaporation.

23

00:01:45,390 --> 00:01:49,470

When the air's temperature is warmer, it can hold more water.

24

00:01:57,580 --> 00:01:53,520

Music

25

00:01:57,600 --> 00:02:01,650

While the atmosphere does not store a large quantity of water

26

00:02:01,670 --> 00:02:05,710

compared to the ocean, rivers and lakes,

27

00:02:05,730 --> 00:02:09,740

it can transport water quickly from one place to another.

28

00:02:09,760 --> 00:02:13,750

Music

29

00:02:13,770 --> 00:02:17,780

Low-lying regions of the atmosphere with high moisture and strong winds,

30

00:02:17,800 --> 00:02:21,800

can form "atmospheric rivers" to transport water horizontally.

31

00:02:21,820 --> 00:02:25,820

Music

32

00:02:25,840 --> 00:02:29,840

Clouds are formed as water vapor cools and condenses

33

00:02:29,860 --> 00:02:33,880

into droplets and ice crystals.

34

00:02:33,900 --> 00:02:37,930

Clouds and water vapor act as insulators in the atmosphere.

35

00:02:37,950 --> 00:02:41,980

Clouds help shield the Earth from the Sun and trap heat from below.

36

00:02:42,000 --> 00:02:46,040

Sound of thunder

37

00:02:46,060 --> 00:02:50,100

When cloud particles grow large enough, they may fall out as rain or snow.

38

00:02:50,120 --> 00:02:54,170

Under the right conditions, areas of precipitation can grow

39

00:02:54,190 --> 00:02:58,250

into large storms. As storms grow,

40

00:02:58,270 --> 00:03:02,280

they transfer heat vertically into the upper atmosphere.

41

00:03:02,300 --> 00:03:06,290

The migration of storms helps to distribute heat between the equator

42

00:03:06,310 --> 00:03:10,300

and poles - shaping wind patterns globally.

43

00:03:10,320 --> 00:03:14,370

How storms grow and intensify

44

00:03:14,390 --> 00:03:18,460

depends upon atmospheric moisture, surface temperatures and

45

00:03:18,480 --> 00:03:22,530

wind patterns. Precipitation is concentrated in some

46

00:03:22,550 --> 00:03:26,530

parts of the world and scarce in others. It can vary substantially

47

00:03:26,550 --> 00:03:30,540

from season-to-season and from year-to-year.

48

00:03:30,560 --> 00:03:34,550

Water that falls on the land surface as precipitation

49

00:03:34,570 --> 00:03:38,580

is stored within snow packs, lakes, reservoirs,

50

00:03:38,600 --> 00:03:42,600

soils and underground aquifers.

51

00:03:42,620 --> 00:03:46,780

Music

52

00:03:46,800 --> 00:03:50,810

Water availability varies from place-to-place

53

00:03:50,830 --> 00:03:54,850

and over time. The availability of water

54

00:03:54,870 --> 00:03:58,890

affects the type and abundance of vegetation.

55

00:03:58,910 --> 00:04:02,920

the primary source of food for animals and people.

56

00:04:02,940 --> 00:04:06,960

Extreme water cycle variability,

57

00:04:06,980 --> 00:04:11,010

unusually dry or wet conditions,

58

00:04:11,030 --> 00:04:15,070

impacts humans worldwide.

59

00:04:15,090 --> 00:04:19,070

Each year, hazards such as floods exact a costly

60

00:04:19,090 --> 00:04:23,070

economic and human toll.

61

00:04:35,260 --> 00:04:27,140

Music

62

00:04:35,280 --> 00:04:39,340

Most of the water that falls on to land remains stored there for weeks or more.

63

00:04:39,360 --> 00:04:43,430

Music

64

00:04:43,450 --> 00:04:47,510

Snowfall is stored as snow pack or ice.

65

00:04:47,530 --> 00:04:51,520

Melt water and rainfall

66

00:04:51,540 --> 00:04:55,530

are stored in lakes and soils. Some of the water is absorbed

67

00:04:55,550 --> 00:04:59,550

by plant roots or drains into the water table.

68

00:04:59,570 --> 00:05:03,570

Eventually, the water

69

00:05:03,590 --> 00:05:07,570

will evaporate to the atmosphere or return to the ocean

70

00:05:07,590 --> 00:05:11,680

in streams and rivers, providing a source of nutrient rich

71

00:05:11,700 --> 00:05:15,700

water that supports ocean life.

72

00:05:15,720 --> 00:05:19,720

Sensors on a suite of NASA satellites observe and measure

73

00:05:19,740 --> 00:05:23,750

water on land, in the ocean and in the atmosphere.

74

00:05:23,770 --> 00:05:27,790

These measurements are important to understanding the availability

75

00:05:27,810 --> 00:05:31,830

and distribution of Earth's water, which is both

76

00:05:31,850 --> 00:05:35,850

vital to life and vulnerable to the impacts of climate change