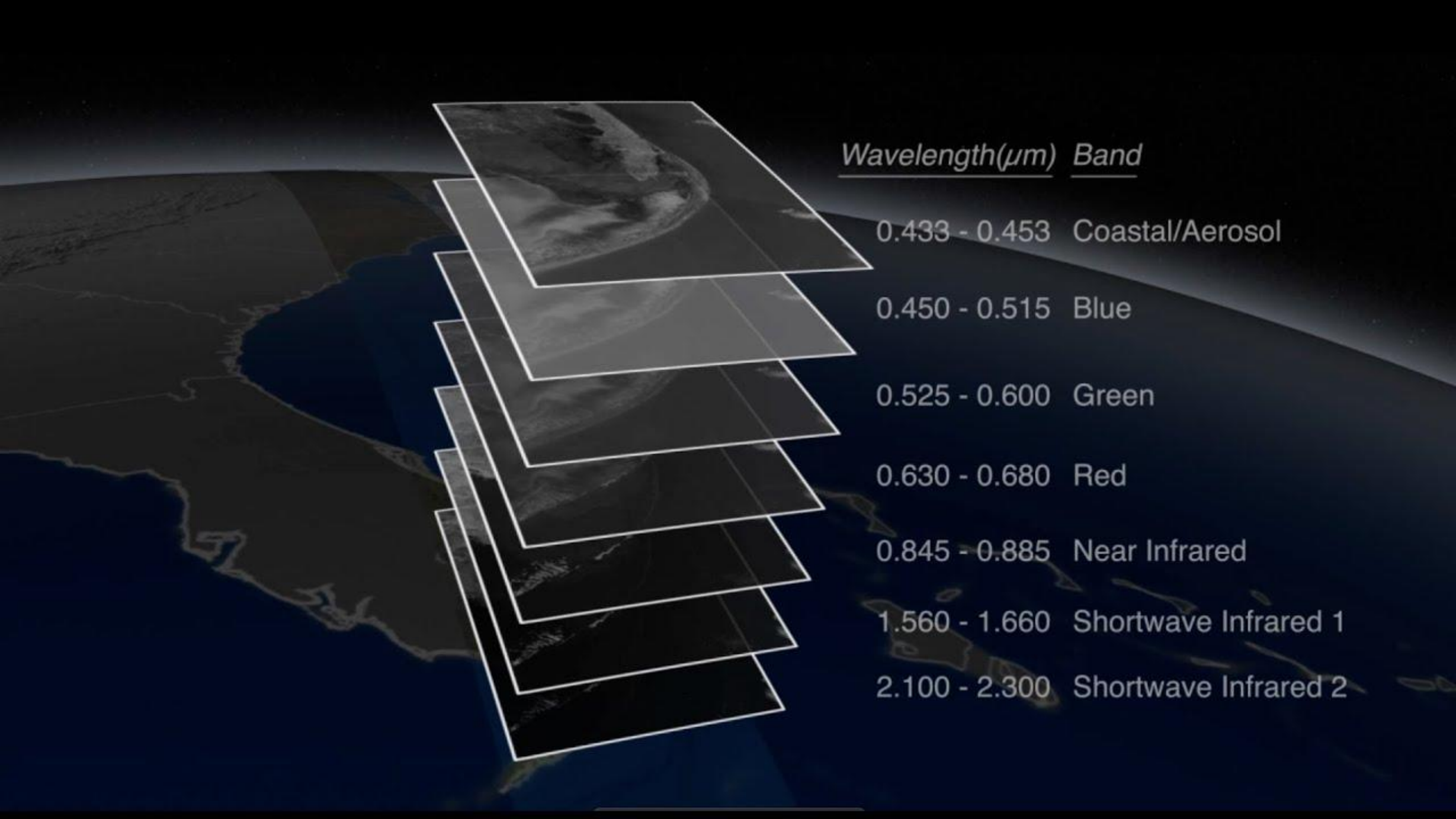
Wavelength(μm) Band
0.433 - 0.453 Coastal/Aerosol
0.450 - 0.515 Blue
0.525 - 0.600 Green
0.630 - 0.680 Red
0.845 - 0.885 Near Infrared
1.560 - 1.660 Shortwave Infrared 1
2.100 - 2.300 Shortwave Infrared 2

1
00:00:00,100 --> 00:00:03,550
When we investigate land cover using the instruments aboard

2
00:00:03,570 --> 00:00:08,110
Landsat satellites, we collect sets of data for different wavelengths.

3
00:00:08,130 --> 00:00:12,130
Some are in the infrared, and others correspond to blue, green, and

4
00:00:12,150 --> 00:00:16,170
red visible light. We can combine any three of the images

5
00:00:16,190 --> 00:00:20,190
to create different depictions of Earth's surface.

6
00:00:20,210 --> 00:00:24,230
What you're seeing now is a Landsat image of Florida,

7
00:00:24,250 --> 00:00:28,250
made with data from the blue, green, and red visible wavelengths.

8
00:00:28,270 --> 00:00:32,280
We call this a "natural-color" image, because it looks

9
00:00:32,300 --> 00:00:40,360
approximately what we would see with our naked eye, if we flew far above Florida.

10
00:00:50,510 --> 00:00:52,530
But we could choose data

11
00:00:52,550 --> 00:00:56,550
from other wavelengths, and map them to blue, green, and red colors

12
00:00:56,570 --> 00:01:00,570
to highlight different features of the land surface.

13
00:01:08,650 --> 00:01:12,640

With this particular depiction of the multi-spectral data,

14
00:01:12,660 --> 00:01:17,930
for example, we can see much greater contrast between trees & shrubs and

15
00:01:17,950 --> 00:01:21,810
sawgrass marsh, than was apparent in the natural-color image.

16
00:01:22,900 --> 00:01:27,920
We call certain combinations of wavelengths "false-color" images,

17
00:01:27,940 --> 00:01:31,480
because they do not replicate what we see with the naked eye.

18
00:01:31,500 --> 00:01:37,030
Yet they allow us to create images where we can highlight or enhance different surface features.

19
00:01:42,070 --> 00:01:45,060
The following depiction approximates the type of

20
00:01:45,080 --> 00:01:50,080
image that you can get from color-infrared film.

21
00:01:50,100 --> 00:01:53,150
It turns out that vegetation -

22
00:01:53,170 --> 00:01:57,210
growing, active vegetation - reflects a lot of light in the near-infrared

23
00:01:57,230 --> 00:02:01,280
and so areas with healthy, growing vegetation

24
00:02:01,300 --> 00:02:07,340
jump out as red in these images.

25
00:02:09,420 --> 00:02:13,440
You can easily distinguish the healthy agriculture more clearly

26
00:02:13,460 --> 00:02:18,090
than you can in the true-color image.

27
00:02:18,110 --> 00:02:21,530
Here you can look at the three different depictions of the

28
00:02:21,550 --> 00:02:25,560
multi-spectral data we use to create these images

29
00:02:25,580 --> 00:02:29,570
and you can see how the surface cover appears different with some features