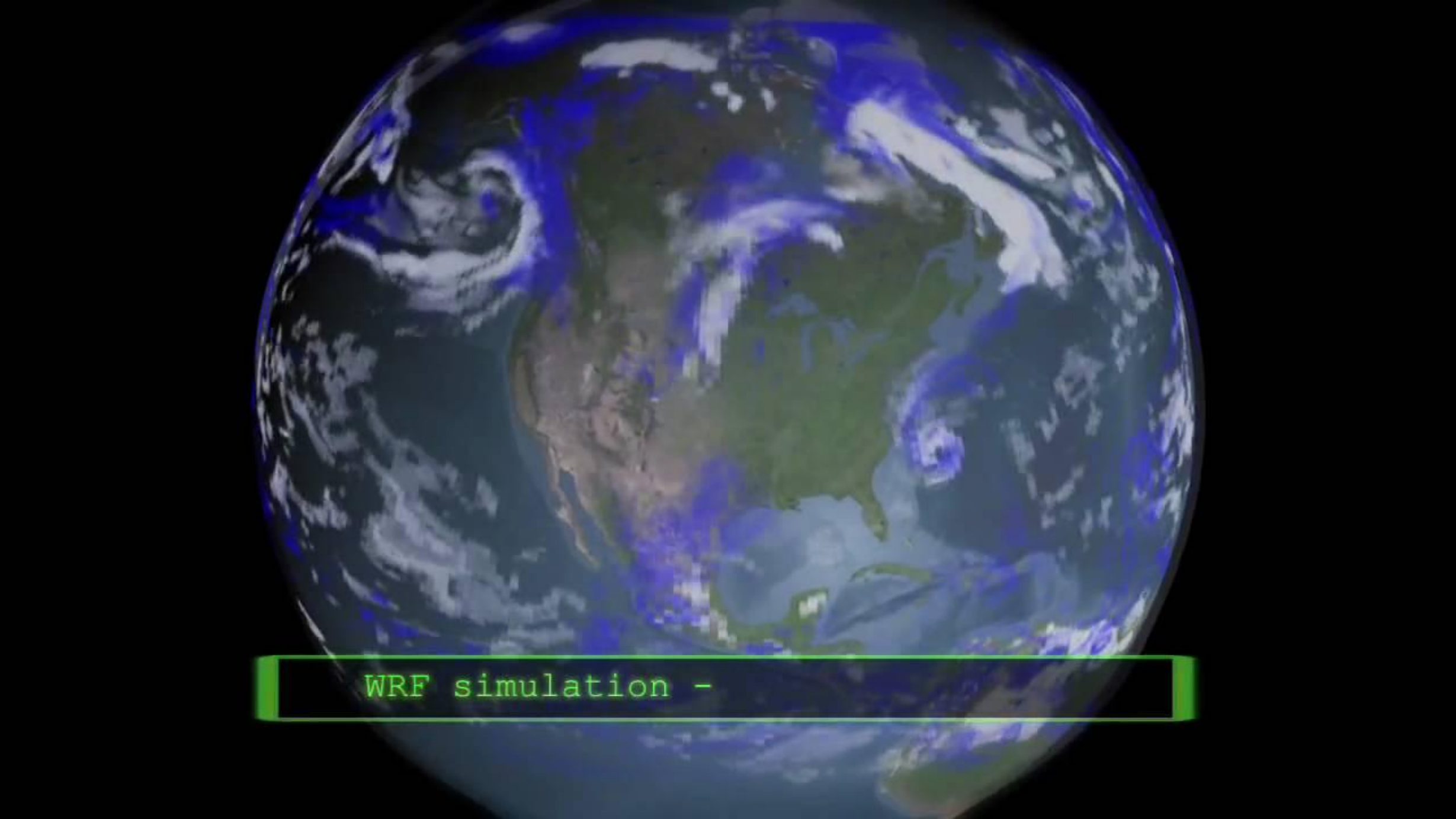
WRF simulation -

1
00:00:10,790 --> 00:00:07,610
climate and weather models are

2
00:00:12,770 --> 00:00:10,800
notoriously complex beasts it takes a

3
00:00:15,079 --> 00:00:12,780
small army of scientists and computer

4
00:00:17,060 --> 00:00:15,089
programmers a year or more to build a

5
00:00:20,150 --> 00:00:17,070
model then they need a supercomputer

6
00:00:21,890 --> 00:00:20,160
fast enough to run it like those models

7
00:00:25,040 --> 00:00:21,900
the machines themselves can be

8
00:00:27,560 --> 00:00:25,050
unfriendly they're hot they're expensive

9
00:00:29,630 --> 00:00:27,570
they're big but when you're trying to

10
00:00:31,849 --> 00:00:29,640
model major parts of the planet's

11
00:00:35,180 --> 00:00:31,859
climate you'll put up with a prima donna

12
00:00:37,700 --> 00:00:35,190
to get punctilious power but always in

13
00:00:39,590 --> 00:00:37,710

the back of your mind a question what if

14
00:00:42,970 --> 00:00:39,600
climate research had some more

15
00:00:46,400 --> 00:00:42,980
accessible tools like one of these a

16
00:00:49,340 --> 00:00:46,410
desktop sized supercomputer with climate

17
00:00:52,310 --> 00:00:49,350
models loaded and ready to run whenever

18
00:00:55,220 --> 00:00:52,320
and however a researcher needs it when I

19
00:00:58,040 --> 00:00:55,230
develop something that will I can run it

20
00:01:02,170 --> 00:00:58,050
I can test it immediately I can see the

21
00:01:06,109 --> 00:01:02,180
result so it increases the productivity

22
00:01:09,020 --> 00:01:06,119
tremendously NASA's vision is to deliver

23
00:01:10,820 --> 00:01:09,030
a set of quality control procedures so

24
00:01:13,070 --> 00:01:10,830
researchers can perfect their own

25
00:01:15,320 --> 00:01:13,080
algorithms with a standardized baseline

26
00:01:17,420 --> 00:01:15,330
the plan would essentially declare a

27
00:01:20,539 --> 00:01:17,430
minimum standard for climate and weather

28
00:01:22,999 --> 00:01:20,549
research facilitating a rapid process of

29
00:01:25,550 --> 00:01:23,009
sharing and evolutionary development of

30
00:01:30,260 --> 00:01:25,560
new ideas and a rapid transition from

31
00:01:33,710 --> 00:01:30,270
research to operation where big iron

32
00:01:36,800 --> 00:01:33,720
costs millions these hot rods cost many

33
00:01:38,749 --> 00:01:36,810
orders of magnitude less where the giant

34
00:01:41,149 --> 00:01:38,759
systems require special rooms and

35
00:01:43,370 --> 00:01:41,159
architecture desktops fit comfortably

36
00:01:46,039 --> 00:01:43,380
into ordinary equipment rooms or even

37
00:01:48,230 --> 00:01:46,049
office spaces but perhaps most

38
00:01:51,350 --> 00:01:48,240

compelling is how these machines deliver

39
00:01:53,300 --> 00:01:51,360
turnkey systems able to ingest data and

40
00:01:54,020 --> 00:01:53,310
start crunching shortly after

41
00:01:56,319 --> 00:01:54,030
installation

42
00:01:58,819 --> 00:01:56,329
they democratize climate research

43
00:02:00,889 --> 00:01:58,829
analogous to how ordinary personal

44
00:02:03,770 --> 00:02:00,899
computers democratize day to day

45
00:02:08,510 --> 00:02:03,780
computing tasks not long ago in other

46
00:02:13,130 --> 00:02:08,520
words easy the reason we put in as a

47
00:02:16,550 --> 00:02:13,140
common software framework is exactly for

48
00:02:19,460 --> 00:02:16,560
for the different disciplines to come in

49
00:02:23,559 --> 00:02:19,470
and use the same interface to be able to

50
00:02:28,309 --> 00:02:23,569
exchange data exchange model exchange

51
00:02:31,840 --> 00:02:28,319
workflow this is the box that were for

52
00:02:34,610 --> 00:02:31,850
from for everybody

53
00:02:37,010 --> 00:02:34,620
NASA is one of the world leaders in

54
00:02:39,860 --> 00:02:37,020
climate model development the Space

55
00:02:42,290 --> 00:02:39,870
Agency's new Geo's 5 model already

56
00:02:45,260 --> 00:02:42,300
produces highly detailed tightly

57
00:02:47,360 --> 00:02:45,270
calibrated output by facilitating

58
00:02:50,270 --> 00:02:47,370
heavyweight climate research on modest

59
00:02:52,580 --> 00:02:50,280
budgets NASA hopes to open the door for

60
00:02:55,100 --> 00:02:52,590
wide groups of scientists to pursue

61
00:02:58,910 --> 00:02:55,110
dramatic climate research that might

62
00:03:01,600 --> 00:02:58,920
otherwise have been inaccessible the

63
00:03:03,680 --> 00:03:01,610

agency's plan essentially gives away

64
00:03:06,259 --> 00:03:03,690
computational models to run on these

65
00:03:08,620 --> 00:03:06,269
systems thus seeding the research ground

66
00:03:12,229 --> 00:03:08,630
with new opportunities for discovery

67
00:03:15,290 --> 00:03:12,239
this capability that's provided by such

68
00:03:17,300 --> 00:03:15,300
a system allows us to run models at a

69
00:03:20,090 --> 00:03:17,310
reasonable resolution for development

70
00:03:22,460 --> 00:03:20,100
and then we once we're satisfied with

71
00:03:25,220 --> 00:03:22,470
the results we're getting on the desktop

72
00:03:28,340 --> 00:03:25,230
system we can then do production on our

73
00:03:31,900 --> 00:03:28,350
very big supercomputers that our room

74
00:03:38,090 --> 00:03:35,150
NASA's software currently runs on Linux

75
00:03:41,120 --> 00:03:38,100
but as these new desktop supercomputers

76
00:03:44,180 --> 00:03:41,130
are also capable of running Windows HPC

77
00:03:47,330 --> 00:03:44,190
the space agency expects to deliver code

78
00:03:49,250 --> 00:03:47,340
compiled for each operating system the

79
00:03:52,250 --> 00:03:49,260
modeling tools themselves are written

80
00:03:54,530 --> 00:03:52,260
primarily in Fortran 90 so the research

81
00:03:56,270 --> 00:03:54,540
community can expect to find themselves

82
00:04:02,690 --> 00:03:56,280
in familiar territory

83
00:04:07,850 --> 00:04:04,440
climate in a box

84
00:04:10,860 --> 00:04:07,860
NASA's big idea for modeling big science