
00

1
00:00:12,950 --> 00:00:11,150
it's mid-december in San Francisco the

2
00:00:15,950 --> 00:00:12,960
holiday decorations and lights are out

3
00:00:18,859 --> 00:00:15,960
everywhere skaters zip around the ice

4
00:00:21,050 --> 00:00:18,869
rink set up in Union Square and as

5
00:00:23,320 --> 00:00:21,060
happens every year thousands of

6
00:00:25,970 --> 00:00:23,330
scientists descend on the city

7
00:00:27,679 --> 00:00:25,980
geophysicists specifically for the big

8
00:00:31,429 --> 00:00:27,689
annual meeting of the american

9
00:00:33,350 --> 00:00:31,439
geophysical union or AG you i'm steve

10
00:00:35,299 --> 00:00:33,360
cole with NASA geophysicist study

11
00:00:37,370 --> 00:00:35,309
everything in the solar system from the

12
00:00:39,709 --> 00:00:37,380
earth to the other planets and the Sun

13
00:00:41,510 --> 00:00:39,719

I'll be introducing you to a few of the

14
00:00:44,510 --> 00:00:41,520
scientists here at the meeting who are

15
00:00:46,250 --> 00:00:44,520
involved with NASA research my name is

16
00:00:48,440 --> 00:00:46,260
Galen McKinley I'm a professor of

17
00:00:50,299 --> 00:00:48,450
atmospheric and oceanic sciences at the

18
00:00:52,760 --> 00:00:50,309
University of wisconsin-madison in

19
00:00:54,830 --> 00:00:52,770
Madison Wisconsin the post time

20
00:00:57,229 --> 00:00:54,840
presenting today is focused on Lake

21
00:00:59,479 --> 00:00:57,239
Superior we've been working for several

22
00:01:01,459 --> 00:00:59,489
years on building a computer model to

23
00:01:03,500 --> 00:01:01,469
simulate the carbon cycle of Lake

24
00:01:06,230 --> 00:01:03,510
Superior that includes the physical

25
00:01:08,210 --> 00:01:06,240
circulation of the lake the biology of

26
00:01:11,120 --> 00:01:08,220
the lake that the phytoplankton and

27
00:01:13,490 --> 00:01:11,130
zooplankton level my research focuses on

28
00:01:15,679 --> 00:01:13,500
understanding how large aquatic bodies

29
00:01:17,590 --> 00:01:15,689
that is the oceans and also the Great

30
00:01:19,999 --> 00:01:17,600
Lakes take up carbon from the atmosphere

31
00:01:22,249 --> 00:01:20,009
carbon in the atmosphere is the major

32
00:01:24,740 --> 00:01:22,259
cause a co2 in particular of global

33
00:01:28,130 --> 00:01:24,750
warming warming the planet and right now

34
00:01:31,010 --> 00:01:28,140
the oceans as a whole take about twenty

35
00:01:33,200 --> 00:01:31,020
five percent of that which humans put in

36
00:01:36,260 --> 00:01:33,210
the atmosphere so we need to understand

37
00:01:38,660 --> 00:01:36,270
how the oceans take up that carbon how

38
00:01:40,670 --> 00:01:38,670

that that that uptake changes with time

39
00:01:42,590 --> 00:01:40,680
and space in order to improve our

40
00:01:44,300 --> 00:01:42,600
predictions of the future state of the

41
00:01:47,060 --> 00:01:44,310
carbon cycle and therefore the future

42
00:01:49,250 --> 00:01:47,070
state of the climate system

43
00:01:51,680 --> 00:01:49,260
so coming to a GU meetings is great

44
00:01:53,960 --> 00:01:51,690
because you get to see so many different

45
00:01:56,180 --> 00:01:53,970
kinds of signs that are being done in

46
00:01:57,710 --> 00:01:56,190
areas that I know very little about you

47
00:02:00,140 --> 00:01:57,720
get a chance to be exposed to those

48
00:02:02,810 --> 00:02:00,150
there are about 19,000 registrants for

49
00:02:05,300 --> 00:02:02,820
this meeting so two large degree it's

50
00:02:07,640 --> 00:02:05,310
drinking from a firehose mine as a new

51
00:02:08,960 --> 00:02:07,650
investigator work is a similar to the

52
00:02:11,029 --> 00:02:08,970
poster I'm presenting today on Lake

53
00:02:13,130 --> 00:02:11,039
Superior but there were focused on the

54
00:02:17,480 --> 00:02:13,140
North Atlantic so we're focused on

55
00:02:19,040 --> 00:02:17,490
understanding how the carbon sink in the

56
00:02:22,250 --> 00:02:19,050
North Atlantic and then eventually the

57
00:02:24,770 --> 00:02:22,260
globe how it is responding over the last

58
00:02:26,750 --> 00:02:24,780
30 years to changing atmospheric levels

59
00:02:28,699 --> 00:02:26,760
of carbon dioxide so I think that our

60
00:02:30,199 --> 00:02:28,709
research matters to everyone out there

61
00:02:32,210 --> 00:02:30,209
largely because we're trying to

62
00:02:33,320 --> 00:02:32,220
understand the global carbon cycle and

63
00:02:34,970 --> 00:02:33,330

that's something that humans are

64
00:02:37,729 --> 00:02:34,980
changing a lot every time we burn fossil

65
00:02:40,070 --> 00:02:37,739
fuels every time we make cement every

66
00:02:42,470 --> 00:02:40,080
time we cut down a tree we put more co2

67
00:02:44,810 --> 00:02:42,480
in the atmosphere and that's driving a

68
00:02:46,250 --> 00:02:44,820
warming climate and a lot of changes

69
00:02:48,500 --> 00:02:46,260
around the world that have been observed

70
00:02:50,509 --> 00:02:48,510
for example declining sea ice in the

71
00:02:52,160 --> 00:02:50,519
Arctic so if we're going to understand

72
00:02:53,930 --> 00:02:52,170
all those processes we need to

73
00:02:55,759 --> 00:02:53,940
understand the fundamental forcing of it

74
00:02:58,190 --> 00:02:55,769
so understanding the global carbon cycle

75
00:02:59,720 --> 00:02:58,200
and the role of large bodies of water

76
00:03:01,940 --> 00:02:59,730
like the Great Lakes or the global

77
00:03:03,860 --> 00:03:01,950
oceans in that carbon cycle is really

78
00:03:05,420 --> 00:03:03,870
critical for predicting what future

79
00:03:07,670 --> 00:03:05,430
climate is going to be like I started

80
00:03:10,759 --> 00:03:07,680
out in civil engineering as an

81
00:03:12,979 --> 00:03:10,769
undergraduate and got very interested in

82
00:03:14,740 --> 00:03:12,989
how we use computers to understand

83
00:03:16,690 --> 00:03:14,750
natural systems

84
00:03:19,090 --> 00:03:16,700
then when I worked for a while as an

85
00:03:21,400 --> 00:03:19,100
environmental engineer I realized that

86
00:03:23,230 --> 00:03:21,410
the people with the phd's in the lab

87
00:03:25,060 --> 00:03:23,240
really did the most of the thinking and

88
00:03:27,010 --> 00:03:25,070

they had the most interesting jobs

89
00:03:30,130 --> 00:03:27,020
because they were able to really be

90
00:03:31,720 --> 00:03:30,140
thinking about a process and not just

91
00:03:33,430 --> 00:03:31,730
for example filling out the reports and

92
00:03:35,170 --> 00:03:33,440
doing sort of the grunt work so that's

93
00:03:39,820 --> 00:03:35,180
what motivated me to go ahead and get a

94
00:03:42,190 --> 00:03:39,830
PhD and now as a professor and and

95
00:03:46,570 --> 00:03:42,200
continuing on that track for for more

96
00:03:48,490 --> 00:03:46,580
than a decade I really am so glad that

97
00:03:51,520 --> 00:03:48,500
I'm in this career because I can think

98
00:03:53,410 --> 00:03:51,530
every day my my work is to think my work

99
00:03:55,240 --> 00:03:53,420
is to go into work and learn something

100
00:03:58,060 --> 00:03:55,250
my work is to come to a meeting like