



Questions about the Sun-Earth System: A Teacher's Perspective

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Global Change and the Solar-Terrestrial Environment

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....the **scientifically literate** person is one who is aware that

- **science, mathematics, and technology** are interdependent human enterprises with strengths and limitations;
- understands key **concepts** and **principles** of science;
- is familiar with the **natural world** and recognizes both its diversity and unity; and
- uses scientific knowledge and **scientific ways of thinking** for individual and social purposes.

Scientific **habits of mind** can help people in every walk of life to deal sensibly with problems that often involve **evidence, quantitative considerations, logical arguments, and uncertainty;**

...without the ability to **think critically** and independently citizens are easy prey to dogmatists, flimflam artists, and purveyors of simple solutions to complex problems.

OECD: Program for International Student Assessment

2006		
Science		
1.	 Finland	563
2.	 Canada	534
3.	 Japan	531
4.	 New Zealand	530
5.	 Australia	527
6.	 Netherlands	525
7.	 South Korea	522
8.	 Germany	516
9.	 United Kingdom	515
10.	 Czech Republic	513

11.	 Switzerland	512
12.	 Austria	511
13.	 Belgium	510
14.	 Ireland	508
15.	 Hungary	504
16.	 Sweden	503
17.	 Poland	498
18.	 Denmark	496
19.	 France	495
20.	 Iceland	491

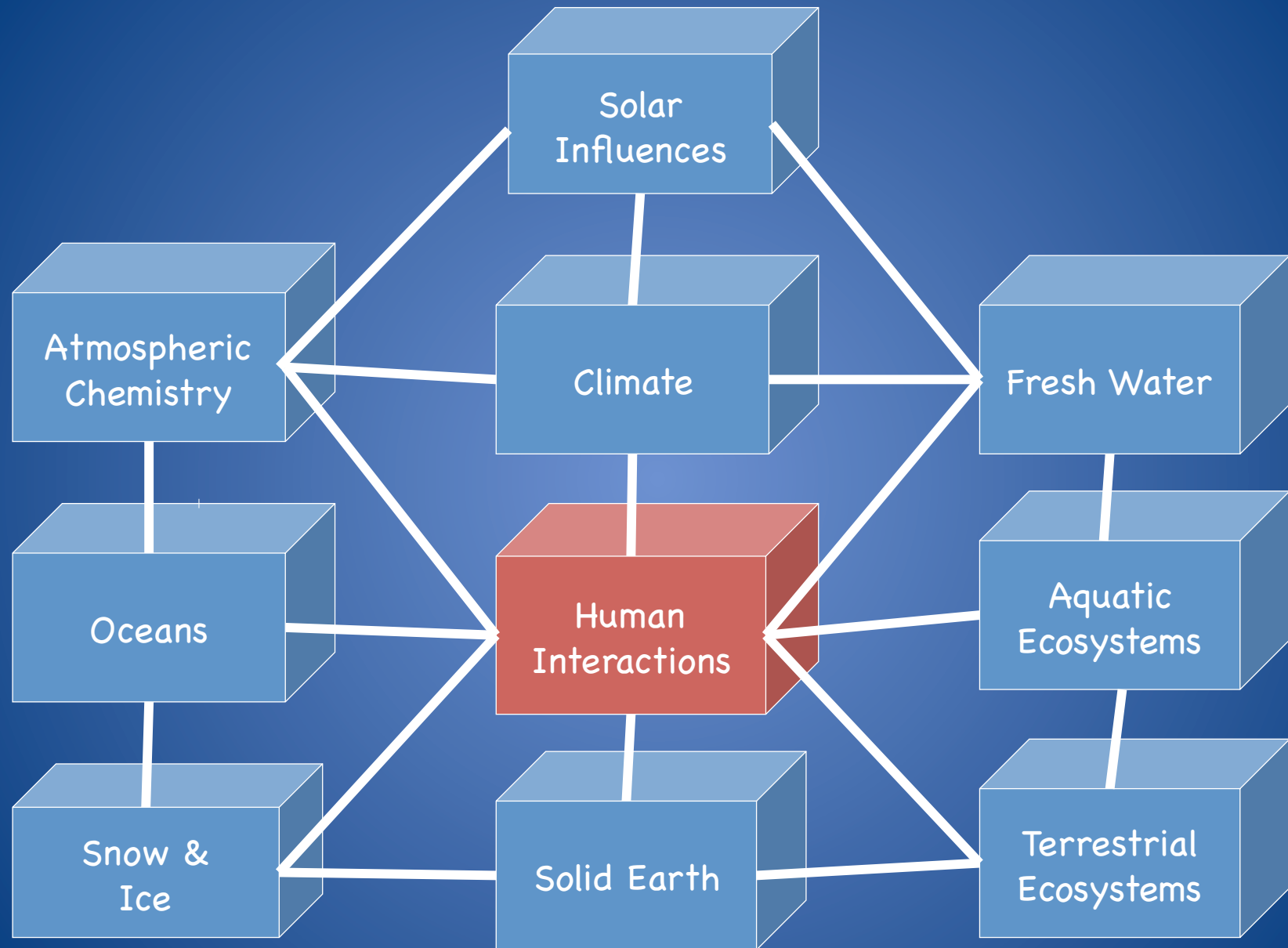
21.	 United States	489
22.	 Slovakia	488
23.	 Spain	488
24.	 Norway	487
25.	 Luxembourg	486
26.	 Italy	475
27.	 Portugal	474
28.	 Greece	473
29.	 Turkey	424
30.	 Mexico	410

AGCI's Mission:

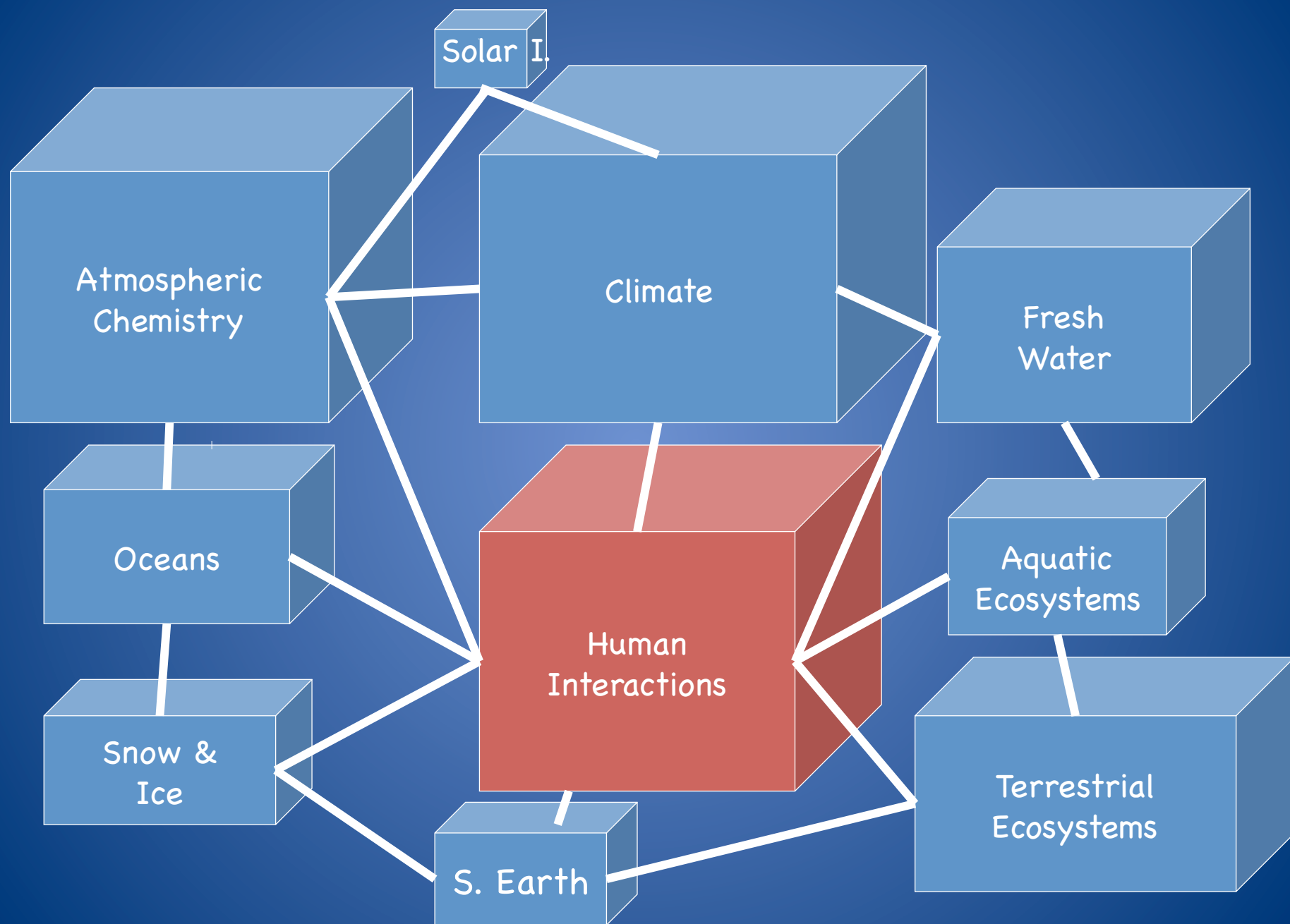
...to further the understanding of Earth
System Science and Global Environmental
Change.

...to further the understanding of the Sun-Earth System and Global Environmental Change.

AGCI's Interdisciplinary Topics



Relative Emphasis



Educational Aim and Features of the AGCI Website



- Past Workshop Archive
 - presentation graphics
 - presentation videos
 - group discussions
 - publications

From the Horse's Mouth



- Vignette Development
 - scientist profiles
 - historical & societal significance
 - complementary graphics
 - narrative explanation
 - activities/problems
 - connections, common themes
 - mapping to educational benchmarks

Survey Question:

3. What key concepts related to your work on Sun-Earth connections do you find hardest to communicate?

The role of solar variability and the stratosphere in climate change. Most people know about anthropogenic effects like the ozone hole and greenhouse gas effects on climate but don't know about or appreciate the solar influences on ozone or climate. The same is true of many scientists including atmospheric scientists.

Wavelengths have different % changes during a solar storm and each wavelength impact the Earth's atmosphere/ground at different layers.

Magnetic fields. People do not realize they can be measured just like most other things, unlike more difficult concepts in geology that they cannot possibly see (like the interior of the sun or earth).

GLOBAL WARMING'S SIX AMERICAS 2009: An Audience Segmentation Analysis



6 Americas

The **Alarmed (18%)** are fully convinced of the reality and seriousness of climate change and are already taking individual, consumer, and political action to address it.

The **Concerned (33%)** – the largest of the six Americas – are also convinced that global warming is happening and a serious problem, but have not yet engaged the issue personally.

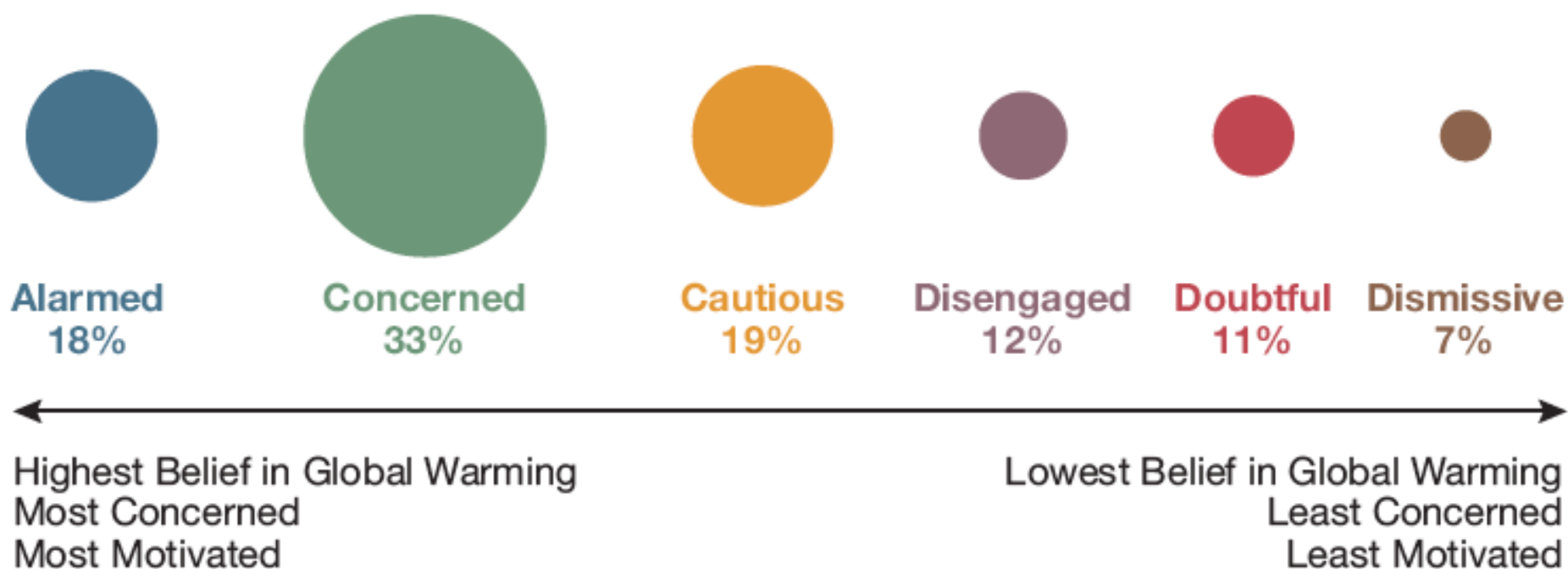
Three other Americas – the **Cautious (19%)**, the **Disengaged (12%)** and the **Doubtful (11%)** – represent different stages of understanding and acceptance of the problem, and none are actively involved.

The final America – the **Dismissive (7%)** – are very sure it is not happening and are actively involved as opponents of a national effort to reduce greenhouse gas emissions.

Maibach et al, 2009

Figure 1: Proportion of the U.S. adult population in the Six Americas

Proportion represented by area



n=2,129

Figure 2: Certainty of belief in the reality of global warming

*Do you think that global warming is happening?
How sure are you that global warming is happening? or
How sure are you that global warming is not happening?*

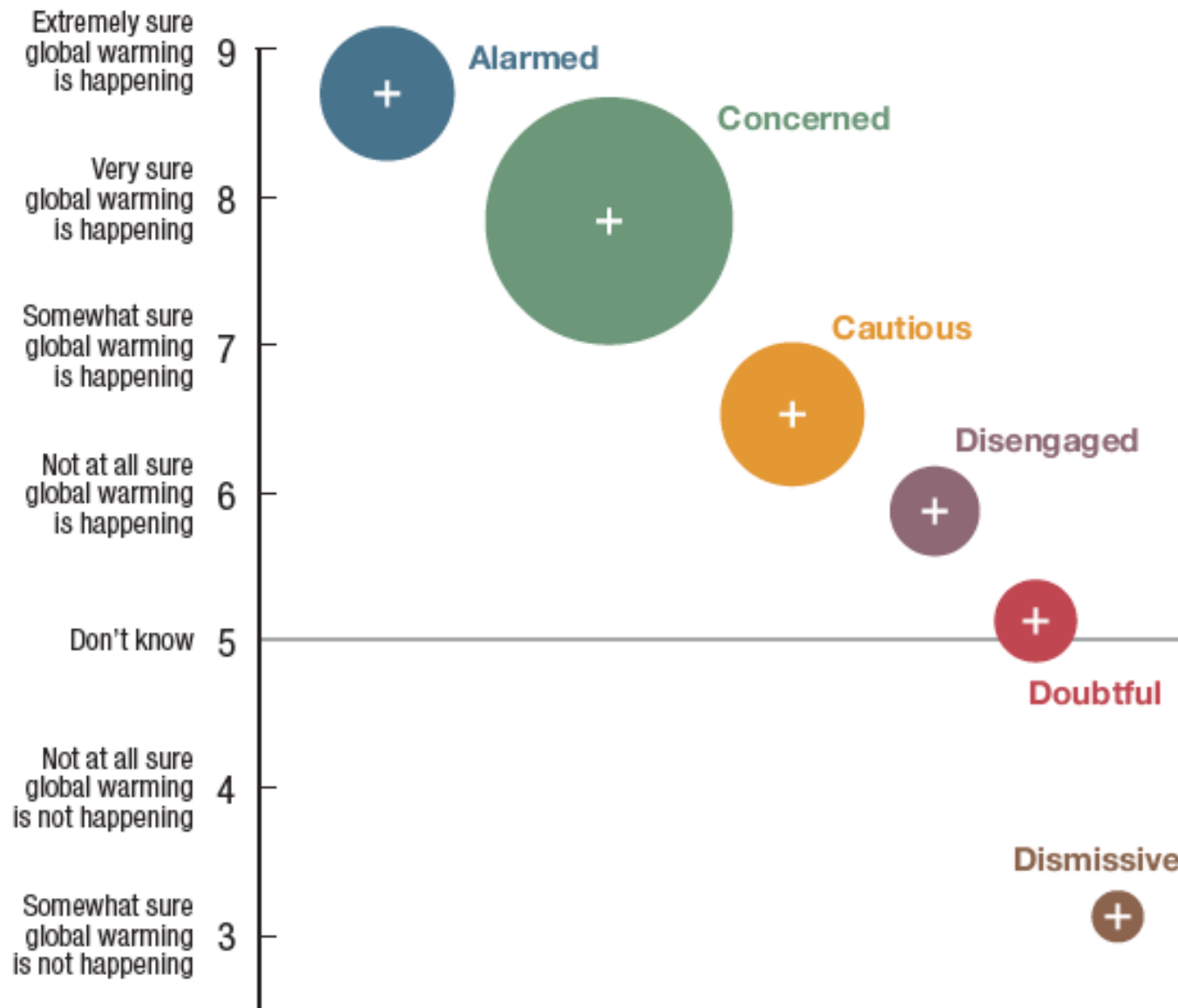


Figure 4: Worry

How worried are you about global warming?

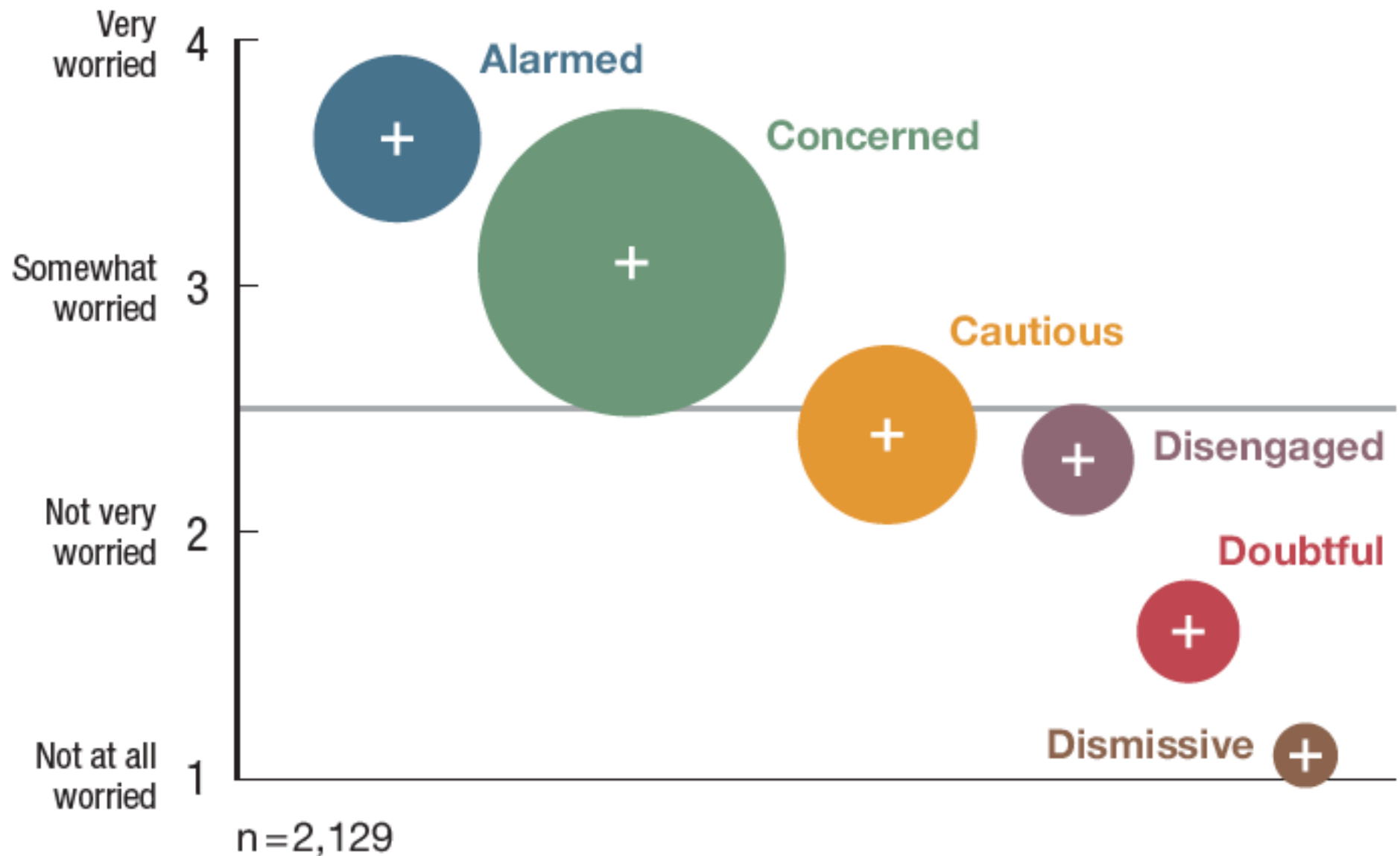


Figure 5: Attitudinal certainty

"I could easily change my mind about global warming."

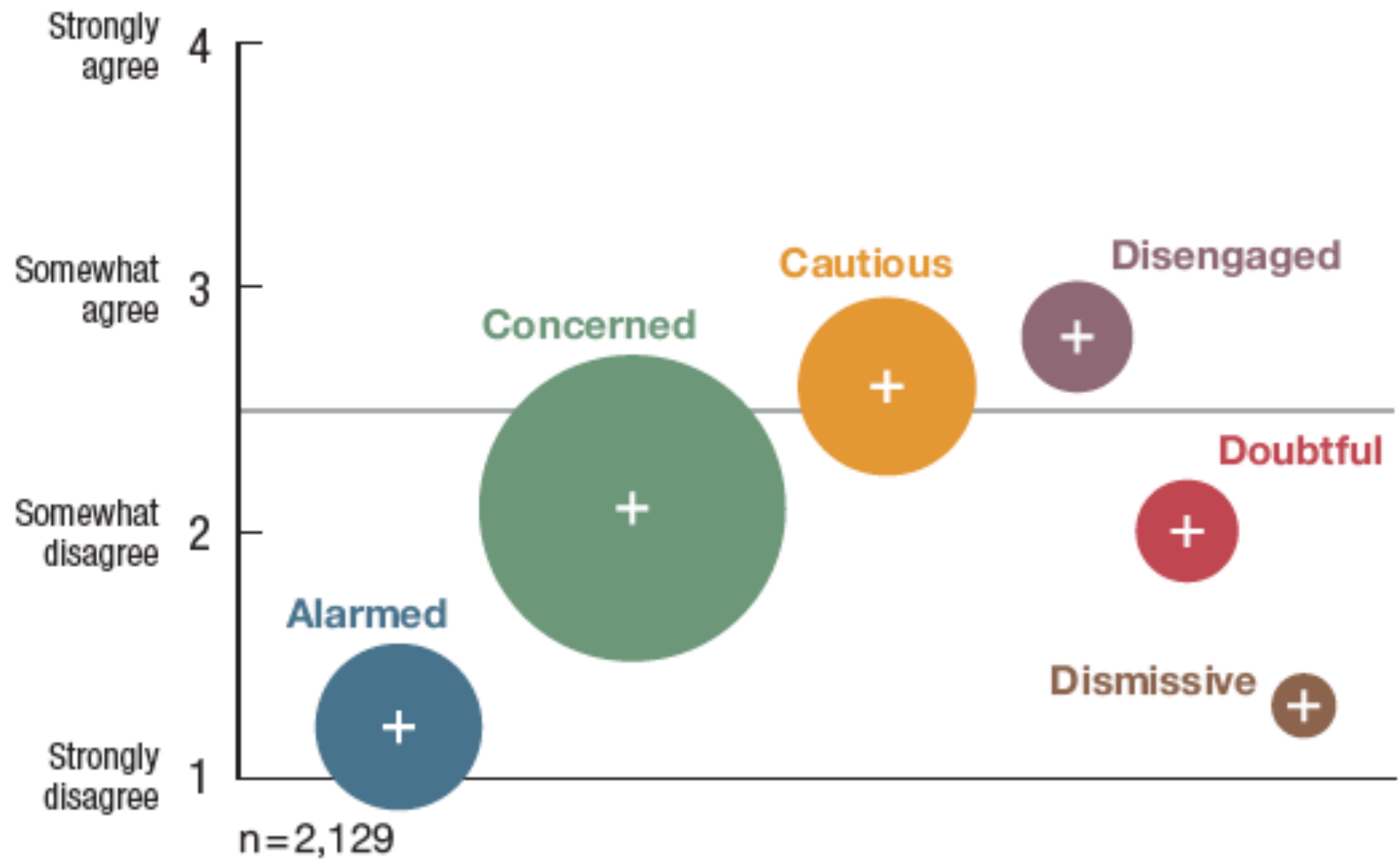


Figure 35: Trust in scientists as sources of global warming information

How much do you trust or distrust the following as a source of information about global warming?

- *Scientists*

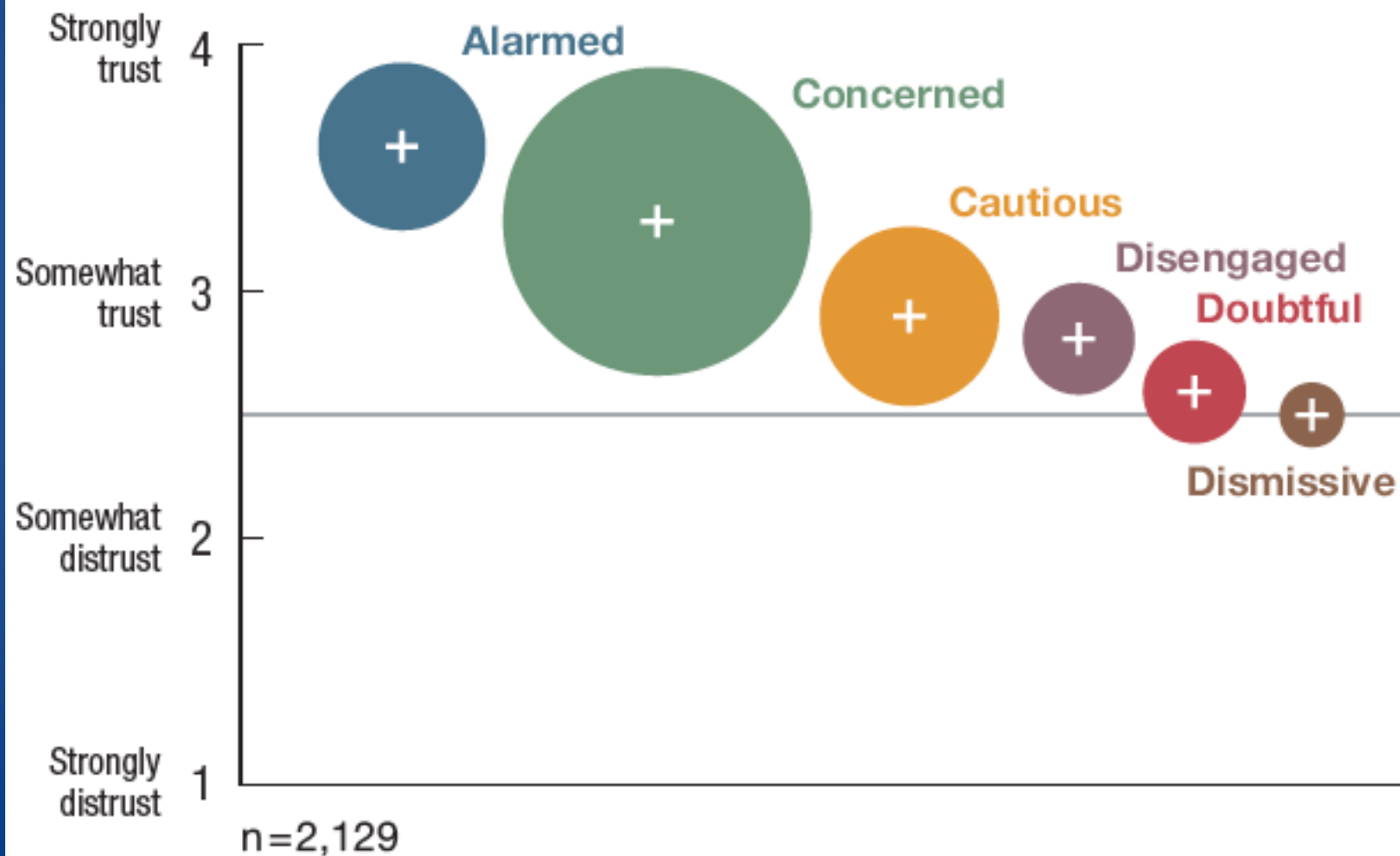


Figure 36: Trust in the mainstream news media as sources of global warming information

How much do you trust or distrust the following as a source of information about global warming?

- *The mainstream news media*

