

Comments on Chapter 13

- 1 a) *Reporting* refers to providing and transmitting scientific findings to
2 scientists, decision-makers, resource managers, and other stakeholders
3 through print and electronic media. This is a traditional, one-way flow of
4 information
- 5 b) *Outreach* refers to “reaching out” and actively engaging decision-makers,
6 resource managers, and other stakeholders in the identification and
7 development of informational tools and products that result from research
8 activities. *In some cases, it may also be a process to solicit comments*
9 *from the end users of the research to even “direct the scope and direction*
10 *of the research.” This idea is expressed in several chapters of the plan,*
11 *namely in Chapter 4, Decision Support Resources and in Chapter 11,*
12 *Human Response and Contributions to Environmental Change.*
- 13 c) *Education* refers to the formal transmittal of basic knowledge, and
14 scientific research findings into the formal K-12 structure, as well as into
15 the classrooms of higher education.
- 16
- 17 4) The plan accurately reports that currently there is “no routine, comprehensive,
18 interagency assessment of public information and outreach efforts,” (page 149:26)
19 and that “reporting and outreach efforts are also individually pursued by each
20 agency” (p. 150:12). Having recognized that there is no comprehensive listing of
21 existing, on-going educational activities, the plan makes a very good suggestion
22 that agencies be surveyed so “they can determine what is effective and can avoid
23 duplication of effort” (p.150, line 25). Similarly, the plan acknowledges “strategy
24 is needed to allocate responsibilities and ensure participation;” and that
25 information is “effectively” disseminated and communicated. However, there is
26 no discussion or definition on what “effectiveness” means anywhere in the report.
27 There is no discussion of the development of evaluation and assessment criteria
28 on what the agencies will utilize to measure effectiveness. This is one of the
29 critical flaws in this chapter. There is a wealth of knowledge in evaluative
30 research and assessments for reporting, outreach (public involvement), and formal
31 educational activities. References to this research, as well as ways to incorporate
32 this research into the various components of this outreach plan should be pursued.
33
- 34 5) *Comments with regard to section “2. Reporting and Outreach to Decision*
35 *makers.”* Please note that the majority of examples on “reporting” to National
36 Policy-makers, the International Community, Local and Regional Government,
37 Businesses, and Non-Governmental Organizations” (P. 151). are one-way
38 communication examples. These include “provide Congressional briefings,
39 science and technology assessment reports; supplement agency outreach with
40 basic information (i.e. brochures, fact sheets); produce hard copy and digital
41 materials; and facilitate regional identification of key stakeholders through
42 workshops and briefings.” This does not embrace the dialogue in the plan of
43 actively engaging “stakeholders” in the process. These individual groups need to
44 be part of the process in identifying what informational materials are needed, and
45 then the respective agencies need to target specific products and services to these
46 key stakeholder groups. The research literature demonstrates that active public

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1 involvement and education is much more than developing a brochure or holding a
2 public meeting, and then demonstrating success by the numbers of individuals
3 reached or brochures distributed. The “effectiveness” of these efforts need to be
4 determined by described “outcome measures” on how these individuals will be
5 utilizing this information in their decision making process or business activities;
6 that is, the information reported was relevant to their needs.
7

8 6) *Comments with regard to section “3. Reporting and Outreach for the Public.”* I
9 wholehearted agree with the statement “a well-informed citizenry is essential for
10 reporting appropriately to the challenges posed by climate change and other
11 global change issues” (p. 152:4). This is the basis on which our Jeffersonian
12 democracy is based. What I disagree with in this section is the focus on providing
13 information to the “general public.” As stated, “the CCSP and participating
14 federal agencies will identify a range of activities and initiatives for reporting
15 useful global change information to the public.” There is no one general public,
16 but a number of “publics” who have varying degrees of interest in climate change
17 issues, depending on the relevance in their lives. Through a thoughtful
18 performance-based process, a series of education and outreach materials should
19 be developed and targeted to specific audiences (or publics). In this way, the
20 effectiveness and impact of these materials can accurately be measured. For
21 example, the plan states the “CCSP will organize workshops for science
22 journalists. This will include joint products to educate journalists so they can
23 provide more frequent and informed coverage of science topics.” This is a good
24 example of selecting a specific target group (journalists) and a measurable result
25 (more frequent and informed coverage). Other examples are more amorphous,
26 such as providing “briefings for the public and public officials” and “organizing
27 and compiling websites, fact sheets, and other public information.” Again, with
28 these identified activities, it appears success would only be measured by the
29 numbers of materials provided or number of meetings held; a very low level of
30 activity measurement with no real measures of effectiveness or impact. There is
31 both an “art and science” in conveying research results and information to user
32 groups. Measurement of impact and effectiveness is accomplished through a
33 variety of evaluative tools such as needs assessments, surveys, and focus groups.
34 Social scientists with expertise in evaluation should be involved in the
35 development and design of these educational activities.
36

37 7) There is a need to have “information brokers” into this outreach process, who are
38 skilled in bringing scientific information to the various “publics.” Examples of
39 these types of information brokers can be found in the USDA Cooperative
40 Extension and in the NOAA Sea Grant Extension programs. In each of
41 federal/state cooperative programs, there are individuals trained and skilled in
42 bridging university science to various user groups who utilize this science in their
43 daily lives. These two organizations have tremendous capability in the transfer of
44 information to stakeholders, since they have a long-term record of success, are
45 trusted.
46

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1 8) Just as the CCSP is an attempt at integrating the research effort, and the
2 Stakeholders meetings provided an opportunity to fine-tune the plan, a similar
3 effort should be made with the education and outreach element. Past examples
4 can be found in the early 1990s to provide a coordinated, integrated outreach and
5 educational plan. Representatives of the federal agencies that would be involved
6 in climate change research and educational activities convened at a workshop in
7 Rhode Island to develop an outreach and education plan. This built on individual
8 agency plans that had also been developed during this time frame. For example,
9 NOAA developed a comprehensive education and outreach plan that highlighted a
10 number of action items. Unfortunately, due to lack of budgets and politics, the
11 majority of these projects were never carried out.

12
13 9) *Comments with regard to section 4. "Outreach and Education."* The plan
14 accurately states that "American children still are not adequately educated in the
15 math and sciences" despite a number of science education programs that have
16 been developed by federal agencies. It also points out that this problem rests not
17 so much with classroom time, but "on the quality of the curriculum and
18 instruction" and suggests time and resources be devoted to teachers and
19 instructional materials. This is an important statement. However, the plan is
20 weak in describing how this will be carried out. If the federal agencies do not
21 actively engage teachers at all levels, the materials will fail as they have in the
22 past. The CCSP only mentions representatives will participate in dialogues with
23 such groups as the National Science Teacher Association to identify basic
24 curriculum content. This process needs to be more than dialogue. The process
25 should be as meaningful and comprehensive as the Stakeholders Workshop. To
26 be successful, one must involve both agency representatives and classroom
27 educators in the critique of existing materials and in the design, development,
28 implementation and evaluation of the future training and materials.

29
30 The plan needs to be more specific in how this information and training will be
31 provided to the teachers. It needs to be more than providing CCSP representation to key
32 educator conferences that include the development of exhibits and handouts. There needs to
33 be on-going pre-service and in-service teacher training. Content of the instruction should not
34 only reflect current research and basic principles of the climate processes, such as global
35 warming, ocean-atmospheric interactions, and ENSO. Content should also address the role
36 of science, importance of peer-reviewed science, and understanding of risk and uncertainty in
37 decision-making. Finally the content all need to conform to national and state educational
38 learning standards.

39 40 Concluding Comments and Observation

41
42 1) There needs to be recognition that "Reporting, Outreach, and Education" is an
43 involved process with specific elements (needs assessments, goal/objective
44 development, implementation, and evaluation). It is not simply developing a
45 brochure, designing an exhibit or providing a lecture to stakeholders.

46

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- 1 2) Evaluation assessments should be built in all “Reporting, Outreach and
2 Education” projects. This will provide the agencies the ability to measure the
3 effectiveness of these activities, and also allow for “adaptive management and
4 development of projects.” A discussion of the issues and difficulty of agencies to
5 carry this out can be found in a recent General Accounting Office Report entitled
6 *Program Evaluation: Strategies for Assessing How Information Contributes to*
7 *Agency Goals* (GAO-02-923).
8
- 9 3) Just as the CCSP is involving research scientists in development of the climate
10 change research activities, the CCSP needs to involve educators and outreach
11 specialists in the development of the climate change education and outreach
12 activities. Encourage collaboration among the vast network of the formal and
13 informal educational community in this process, and also include the NGOs.
14
- 15 4) Recognize that results in the Reporting, Outreach and Education area will also
16 take time. As such, allow adequate budgets to provide a long-term strategy in the
17 development of materials and training of educators at all levels.

18 **MIKE SPRANGER, UNIVERSITY OF FLORIDA**

19
20 Page 149, Chapter 13: First Overview Comment: Insufficient Sharing with the Public
21 and Policymakers

22
23 Finally, the draft claims the U.S. government has spent almost \$20 billion on climate
24 change activities - or more than the entire gross domestic product of a quarter of the
25 world's countries.

26
27 However, to date, far less than 1% of that amount has been spent providing the
28 extraordinary results of that research with the people that need it - and paid for it - the
29 public and the policymakers.

30
31 This draft plan should first commit to sharing the existing information obtained from
32 THAT research. This draft plan should then have a specific funding plan to share all
33 future research results the public and the policymakers.

34
35 Proposal #5: Priority and Budget of Outreach I propose each federal agency supporting
36 this process commit funding for outreach, be commensurate with the magnitude, and the
37 potential impact, on the communities that agency serves.

38
39 In no event, should any less than 20% of the total project budget be dedicated to public
40 education and direct outreach to policymakers. All materials should include a factual
41 analysis of response options, with estimated costs, as well as a listing of those federal,
42 state and local entities, government and otherwise, offering to provide further assistance
43 to them.
44

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1 Finally, the cost-effectiveness of the federal education and outreach programs should be
2 measured against the comparable results that could be expected from a private vendor
3 specializing in public education and policymaker outreach.

4 **BLAIR HENRY, JD, UNIVERSITY OF NORTH DAKOTA**

5
6 Page 149, Chapter 13: We do not think this chapter is particularly relevant to the
7 development of a strategic research plan. In large measure, it is partly a restatement of
8 ongoing activities of the U.S. Global Change Research Program, which includes the
9 National Global Change Research Plan, as defined in section 2 of the Global Change
10 Research Act of 1990. Section 104(d) of the 1990 Act provides that the Plan “shall
11 provide recommendations for collaboration within the Federal Government and among
12 nations to,” among other things, “establish, develop, and maintain information bases,”
13 and “combine and interpret data from various sources to produce information readily
14 usable by policymakers attempting to formulate effective strategies for preventing,
15 mitigating, and adapting to the effects of global change.” In addition, as noted in this
16 chapter (p. 151), the Global Climate Research Office was established by section 204 of
17 the 1990 Act “to disseminate to foreign governments, businesses, and institutions, as well
18 as the citizens of foreign countries, scientific research information available in the United
19 States which would be useful in preventing, mitigating, or adapting to the effects of
20 global change.” The section lists six categories of such information for dissemination,
21 including “reducing energy consumption through conservation and energy efficiency,”
22 “promoting the conservation of forest resources which help reduce the amount of carbon
23 dioxide in the atmosphere,” and “assisting developing countries in ecological pest
24 management practices and in the proper use of agricultural, and industrial chemicals.”
25

26 Rather than address these statutory requirements, the draft explains (p. 149) that
27 improved “coordination, reporting, and outreach among federal agencies are required to
28 make research results and decision support resources more readily available and useful to
29 stakeholders.” It states that this “reporting and outreach plan consists of working with
30 two kinds of stakeholders”:

31
32 The first includes those who need or are affected by climate
33 information, including policymakers, resource managers, the scientific
34 community, the private sector, non-governmental organizations (NGOs),
35 and the international community. The second kind of stakeholder includes
36 those involved in education—whether it is the general public, K-12
37 students or those who communication information (i.e., media, educators).
38

39 These “stakeholders” are not “federal agencies,” nor are they the entities listed in
40 the 1990 Act. Given the importance of the research, as emphasized by the President, and
41 budgetary constraints, the reporting of results must be more focused according to the
42 statutory requirements. In its present form, this chapter should be abandoned.

43 **FANG/HOLDSWORTH-EDISON ELECTRIC INSTITUTE.**

44
45 Page 149, Chapter 13: Note: These comments are based in part on the presentation I gave
46 as a panelist for the breakout session on Chapter 13: Reporting and Outreach at the U.S.

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1 Climate Change Science Program: Planning Workshop for Scientists & Stakeholders,
2 December 5, 2002. I append the power point presentation to these comments.

3
4 **First Overview Comment:** This chapter focuses on methods to disseminate information
5 from USGCRP to the public. However, outreach is much more effective when it is
6 integrated with stakeholder networks. I suggest closely tying the work of reporting and
7 outreach to the development of decision support stakeholder networks described in
8 Chapter 4. In this way the information provided is effectively tailored and responsive to
9 appropriate audiences' concerns and needs. For example, natural resource managers,
10 local civic officials, museums, and K-12 educators may all be appropriate audiences for
11 information but would require that information in different formats and in response to
12 different questions.

13
14 **Second Overview Comment:** It is the responsibility of the US Climate Change Science
15 Program to actively report and do outreach on all scientifically supportable information
16 that has been produced by the US Global Change Research Program on climate change.
17 This must include scientific information that was accumulated as part of The National
18 Assessment of the Potential Consequences of Climate Variability and Change. Outreach
19 for this landmark Assessment has not been adequately funded. Many regions have
20 applied for additional funding to report their findings to their stakeholders and local
21 communities and have been denied. There is a wealth of good, scientifically sound
22 information that has never been adequately disseminated to the general public. This
23 research was performed with extensive stakeholder involvement and was tailored to
24 address their concerns. Decision makers and the public still need basic information on
25 climate change science, potential impacts and choices, information that already exists as
26 part of the National Assessment.

27
28 **Third Overview Comment:** Instead of starting from scratch, it is very important to build
29 outreach and reporting on existing distribution networks. For example, stakeholder
30 groups that were formed as part of the National Assessment would be an excellent
31 starting point for distribution of both existing and new scientific information that results
32 as part of the Climate Change Science Plan. These groups consist of local government,
33 federal agency, energy/utility industry, business, tourism, insurance, NGO's, educators,
34 scientists, researchers. The individuals are in many cases already engaged and motivated.
35 Use of existing groups can save dollars and time versus starting from scratch. The
36 individuals are familiar with regional/sector priorities & vulnerabilities, and adaptation
37 options. Most importantly for the discussion of outreach and reporting, these are the
38 groups and individuals that can help disseminate new and existing findings quickly and
39 effectively.

40
41 **Fourth Overview Comment:** Educational outreach should leverage existing educational
42 distribution networks. One example of this is the New England Science Center
43 Collaborative, which links science and nature centers with academic institutions to
44 educate the public of New England on Climate Change. The US Climate Change Science
45 Program should affiliate with museums, nature centers and museum/academic
46 consortiums to both fund existing efforts and help create new exhibits and educational

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1 opportunities. Other educational networks include those of the American Meteorological
2 Society, the Cable in the Classroom program, and various master science teacher
3 programs. Public/private partnerships to sponsor radio, film and television
4 documentaries, should also be proposed.

5
6 **Fifth Overview Comment:** Broadcast meteorologists - TV, radio and internet forecasters
7 - will increasingly be called upon to interpret our changing climate to the public. They
8 are now the primary existing public source for information on weather, climate, and its
9 impact on our lives. As climate continues to change and as extreme events become more
10 frequent, their role will become even more important. It is therefore essential that this
11 community in particular become as well informed as possible on climate change science
12 and the potential impacts to our weather and our society. To accomplish this I suggest
13 that continuing education through the American Meteorological Society be funded to
14 include annual symposia on climate change science at the AMS sponsored Broadcast
15 Meteorology conferences. Further, the Climate Change Science Program should allocate
16 enough funding to allow partnership with media outlets – including public, cable and
17 network TV, radio and print - to provide the American public with the most credible and
18 up to date science on climate change and our options for response.

19
20 Omission of Chapter on basic science research in support of ‘solutions science’ and
21 coordination with the Climate Change Technology Initiative.

22
23 Because there is no specific chapter on this topic, I had made this comment within my
24 Chapter 4 comments. However, since different teams make work on different chapters, I
25 would like to pull out that comment so that it can be referred to whichever team is most
26 appropriate in writing this plan. I copy the comment below.

27
28 One of the most important decisions that will have to be made in the next decade is how
29 to implement technologies that will reduce greenhouse gas emissions from energy use.
30 While there is a separate Climate Change Technology Initiative (CCTI), supported by a
31 number of government agencies, there is still a significant need for basic science research
32 to support these emerging technologies. Large research areas exist here - for example the
33 unintended consequences of carbon storage in terms of safety, health, and the
34 environment; improvements and funding for geologic and oceanic testing, measurement,
35 and monitoring of disposed carbon dioxide; and consequences to the surface ocean
36 ecosystem of fertilization with iron to increase carbon storage in phytoplankton. The
37 CCSP must include a chapter that focuses on these issues. There was a breakout session
38 at the workshop focusing on this ‘solutions science’ but no corresponding section of the
39 science plan. In addition, a formal relationship between the CCTI and the CCSP should
40 be made with explicit funding of scientific research to support it. This will be crucial
41 information for decision makers when deciding between different options to mitigate
42 greenhouse gas emissions.

43 **JANINE BLOOMFIELD, ENVIRONMENTAL DEFENSE**

44
45 Page 149, Chapter 13: First Overview Comment: The term uncertainty is utilized without
46 any clear definition of the term. As this is the main theme of much of the report, it

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1 portrays an incorrect image of climate science that everything is uncertain and that no one
2 can or should act until the uncertainty levels are diminished. It then goes on to lay out a
3 high risk strategy of waiting until an unknown day for uncertainties to be reduced before
4 any action can be taken. The risks are high as the lifetime of greenhouse gases in the
5 atmosphere is long and mitigation efforts will not take immediate effect, unlike some
6 other pollutants. This also ignores decades of research by US institutions and others that
7 have reduced uncertainty levels on a wide range of climate issues. A guide to the
8 uncertainty levels is clearly included in the IPCC's Third Assessment Report.

9 We would therefore strongly recommend that the report and the research efforts around it
10 not revolve around reducing uncertainties per se, but rather provide new and useful
11 information for policymakers. Finally, to infer that policymakers must have 100%
12 certainty before taking any decisions is not consistent with the current situation. As the
13 report notes, there are many uncertainties surrounding terrorism, but the government is
14 not waiting for 100% certainty before taking preventative measures such as increasing
15 security in airports.

16 **JENNIFER MORGAN, WORLD WILDLIFE FUND**

17
18 Page 149, Chapter 13: "Reporting and Outreach" is where the products of the entire
19 Climate Change Science Program (CCSP) reach the public and the political process. The
20 result is climate change policy, which can range from inaction, to actions such as the
21 Kyoto Protocol, to proposals for drastic reductions in greenhouse emissions.

22
23 That policy continuum has been very ill-served in recent years. In order to improve the
24 credibility of federal outreach, I propose the establishment of a "Reporting and Outreach
25 Oversight Committee" (ROOC), described below.

26
27 The reasons for the establishment of this Committee are manifold, and many can be
28 found in the CCSP proposal itself.

29
30 As the CCSP proposal notes, much of current outreach has been carried out through the
31 US Global Change Research Program (USGCRP). This will likely continue in the future.

32
33 While it has probably been the most important federal reporting and outreach apparatus
34 on climate change in recent years, USGCRP has been perhaps the most biased unit on
35 climate change in the entire federal apparatus. This occurred because senior management
36 has largely been composed of people with extreme views on climate change. This may
37 stem largely from the fact that very little of that senior management consisted of trained
38 atmospheric scientists. Instead, selection of that management was a political decision
39 undertaken by the previous Administration and that management has left in place an
40 institutional legacy that remains today.

41
42 Consequently, in order for CCSP Reporting and Outreach to meet a more normal
43 standard for balance, the entire USGCRP staff must be examined for balance by the new
44 ROOC. As a start, ROOC should order USGCRP to sever relations with previous
45 employees who are now serving as consultants, and to ask for letters of resignation from
46 others, allowing further consideration after re-evaluation.

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1
2 There is a large and impressive body of evidence for the bias and radical nature of the
3 recent USGCRP.

4
5 °The “monthly Congressional seminar series”, noted on page 150 of the CCSP draft, was
6 profoundly one-sided, consisting largely of scientists who were in agreement with the
7 more lurid view of climate change. Scientists with different views were either
8 completely absent from the list of speakers, or were only allowed to present if there was
9 opposing “balance”. That “balance” was highly selective, while those championing the
10 lurid view of climate change were never opposed.

11
12 This would never have occurred in USGCRPs funding were vetted through a ROOC-style
13 committee.

14
15 °The USGCRP coordinated production of the 2000 “National Assessment” of the
16 potential effects of global warming, which gave rise to much of the subsequent “Climate
17 Action Report” released in 2002. In the Assessment, USGCRP chose to flout the normal
18 ethic of science, in which models must conform to observations before they can be used
19 to determine effects with any credibility.

20
21 USGCRP’s contravention of scientific norms resulted in a legal action under Federal
22 Data Quality Act statutes as well as a hearing by the House Oversight and Investigations
23 Subcommittee in 2002.

24
25 Such a situation would probably not have evolved if the USGCRP had effective
26 oversight. It certainly would not have committed to such a biased seminar series or such
27 a scientifically controversial National Assessment.

28
29 Reporting and Outreach problems on climate change re not merely confined to USGCRP.
30 In fact, they are endemic in virtually every large federally-funded entity involved. That is
31 largely because of the nature of the scientific community, discussed briefly below. Once
32 this nature is recognized, corrective administrative measures, such as creating of the
33 ROOC, can be taken to counter its inherent bias.

34 35 *Understanding the Sociology of Global Change Science*

36 How could the scientific community have accepted the bias of the Seminar Series and the
37 National Assessment, and what does this portend for the future?

38
39 That community encouraged excesses. And, unless CCSP management is aware of the
40 sociology of global change science, this tendency will continue or even worsen.

41
42 Dramatically increasing the research budget for global climate change, as is proposed in
43 the current document, increases the pressure on scientists to accentuate negative aspects
44 of climate change and to display the issue without balance. This is a natural product of
45 the reward structure for academic research, which is largely predicated upon the amount

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1 of federal funding that a scientist brings to his University. Equivocal “problems” do not
2 merit \$4 billion per year in a federal market where health care, environmental, and social
3 concerns compete for funding. Only those presented in the most lurid fashion receive
4 funding.

5
6 Threatening that funding stream places the individual scientist at a disadvantage
7 compared to others competing for a finite federal outlay. Consequently, the CCSP must
8 be aware that the science community, in general, will react negatively to members who
9 may question the severity of environmental issues that are receiving substantial funding.

10
11 CCSP needs to actively counter this tendency by making Reporting and Outreach support
12 to USGCRP and other applicants contingent upon a demonstrated diversity of reasonable
13 scientific outlook. This was clearly lacking in the committee that directed the National
14 Assessment. A Reporting and Outreach Oversight Committee, such the one detailed
15 below, would have encouraged a proper diversity.

16
17 Interestingly, there is another large community of climatologists that is not as inherently
18 lurid on climate issues as many Federal entities, and has substantial experience in
19 Reporting and Outreach on climate science. This is the American Association of State
20 Climatologists (AASC) , a scientific society consisting of about 200, which includes
21 State Climatologists and their professional staffs. Perhaps they are less strident because
22 these individuals serve daily as the interface between climate issues and the public,
23 requiring quotidian hand-on experience with weather data and the impact of climate.
24 Daily immersion in this activity can lead to the conclusion that the world is in fact not
25 headed towards perdition because of climate change, but rather that there is a great deal
26 of social adaptation that takes place in our variable world. Whatever the reason, this
27 community tends to be much less alarmist on the climate change issue than the USGCRP
28 and other federal organizations, and it is also very effective at public communication.

29
30 Other public commentary on CCSP, submitted by Roger Pielke, President of the
31 American Association of State Climatologists, makes it quite clear that AASC is very
32 willing to lend its expertise to CCSP, particularly in the areas of climate impacts and
33 proper communication of science, and in communicating the limitations of climate
34 science. In its CCSP commentary, AASC notes:

- 35
- 36 • Human activities have an influence on the climate system. Such activities,
37 however, are not limited to greenhouse gas forcing and include changing
38 land cover and aerosol emissions, which further complicated the issue of
39 climate prediction. Furthermore, climate predictions associated with
40 human disturbance of the climate system have not demonstrated skill in
41 projecting future variability and changes in such important climate
42 conditions as growing season, drought, flood-producing rainfall, heat
43 waves, tropical cyclones and winter storms. These types of events have a
44 more significant impact on the United States than annual global
45 temperature trends.
- 46

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1 A search of USGCRP outreach documents reveals no analogously unequivocal statement
2 about the limitations of climate science. This alone argues for active inclusion of AASC
3 in the Reporting and Outreach activities of the CCSP.

4
5 Further, AASC notes,

- 6
7 • General circulation models which have been applied to project changes in
8 global and regional climate for periods of decades into the future need to
9 be viewed as hypotheses about the behavior of the atmosphere in response
10 to human disturbance. The validity of such models is uncertain because
11 our understanding of all relevant climate factors (and their relationships
12 and interactions) is incomplete. New research should be based only upon
13 hypotheses that can be verified by observed data. This underscores the
14 need to continue (and, in fact, enhance) the long-term climate monitoring
15 system in the United States so that, for example, climate models can be
16 properly tested.

17
18 At the December Planning meeting for the CCSP, USGCRP consultant (and former
19 coordinator for the National Assessment) Michael MacCracken argued that a simple test
20 of the GCMs that were used in the Assessment on observed temperatures over the United
21 States during the period of greenhouse enhancement was not appropriate. The fact that
22 USGCRP is at such variance with AASC, whose leadership is certainly at least on a
23 scientific par with that of the USGCRP, indicates there is a vigorous debate over what
24 scientific information may appropriately be presented to the public.

25
26 This disparity of informed scientific opinion is prima facie evidence for the need for
27 enhanced scientific diversity in important Reporting and Outreach activities of the CCSP.

28 29 Specific Recommendations

30 •CCSP establish a “Reporting and Outreach Oversight Committee” (ROOC) specifically
31 designed to be inclusive. Membership should be from the scientific, environmental and
32 industrial communities, with special attention paid to the fact (noted above) that the
33 scientific community is itself economically biased towards exaggeration of funded or
34 potentially funded environmental threats.

35
36 •Because of their scientifically controversial nature, stemming from lack of appropriate
37 oversight diversity, ROOC should request removal of the “National Assessment” from
38 USGCRP communications as well as a web submission explaining why it had to be
39 removed.

40
41 •Because it is largely based upon the National Assessment, Chapter 6 of the Climate
42 Action Report-2000 should similarly be withdrawn by its publisher, the Environmental
43 Protection Agency, along with appropriate explanatory literature.

44
45 •All federal funding disbursed through the CCSP for Reporting and Outreach must be
46 approved by that Committee. The Committee will attach particular importance to the
47 scientific and policy diversity that resides in any organization whose funding it oversees.

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1
2 •As a centerpiece of CCSP Reporting and Outreach, the ROOC coordinate the staffing
3 and development of a new “National Assessment” of potential effects of climate change
4 on the United States, superceding the withdrawn version; in addition, the next “Climate
5 Action Report” should contains text on the impact of climate change based upon the new
6 Assessment. ROOC should enlist a much more diverse coordinating staff for the new
7 Assessment, in particular including the expertise of the American Association of State
8 Climatologists.

9 **PAT MICHAELS, UNIVERSITY OF VIRGINIA**

10
11 Page 149, Chapter 13: 1. The reporting/outreach initiative needs to address more
12 explicitly another important component of the educational community, that is, college-
13 level teachers of the physical and life sciences. As is widely known, global change
14 impacts all sectors of society and is the focus of interdisciplinary study. Increasingly,
15 global change is a topic covered in a variety of general education courses taught by
16 faculty with expertise in a broad range of disciplines from geography to ecology.
17 Scientists schooled in disciplines other than the atmospheric sciences would profit from
18 opportunities for training in climate science (e.g., Chautauqua lectures) and so too would
19 their students. The professional societies (e.g., AAAS, AMS, AGI, AGU, AAG) could
20 play a significant role in this effort.

21
22 2. Both students and teachers are important stakeholders but it is through the K-12
23 teachers that you reach the students and develop the next generation of scientifically
24 informed citizens. Teachers are largely at the mercy of local school boards and state
25 educational agencies regarding what they can and cannot teach in their classrooms. Any
26 meaningful and effective outreach program on climate science for teachers should
27 involve teacher input on the design of learning activities and initiatives from the outset.
28 In this way, the outreach plan will address realistically some key questions such as: How
29 can teachers best integrate climate science in their classrooms? What are the basic
30 understandings regarding climate science that a teacher should master? How should a
31 teacher deliver these basic understandings? Furthermore, it is not enough to merely
32 throw information at teachers and students. Meaningful learning comes out of guided
33 inquiry that today can make use of real-time environmental data delivered via the
34 Internet, making for exciting and highly motivational learning experiences. The
35 professional societies and universities can play an important role here.

36
37 3. Although the general public may be "the largest and most important audience for the
38 communication of reliable global change information," the most effective and efficient
39 means of reaching the general public is through the formal education system. In this
40 report, the "media" appears to be on equal footing with the educational community. How
41 do people learn their science? Some electronic and print media have done an outstanding
42 job in delivering scientifically authentic messages on global change, but unfortunately
43 time and space constraints too often result in the distribution of incomplete, misleading,
44 or inaccurate information. As with K-12 teachers, any meaningful and effective outreach
45 program for the media should involve the input of media representatives from the outset.

Comments on Chapter 13

1 **JOSEPH M. MORAN, AMS**

2
3 Page 149, Chapter 13: The goal of performing outreach to climate-impacted decision
4 makers, educators, and the public is very important. Chapter 13 specifies many laudable
5 specific goals. However, an important omission in this discussion is the role that
6 members of the existing climate services infrastructure can play in fulfilling the outreach
7 goals. While the Global Change Research Information Office is mentioned explicitly, the
8 tripartite climate service system formed by the National Climatic Data Center (NCDC),
9 the Regional Climate Centers (RCCs) and State Climatologist Offices (SCOs) could play
10 an important role in outreach given proper resources. The RCCs and SCOs, in particular,
11 already have a regional focus, connections to decision makers in state and local
12 governments and private firms, and ongoing educational and public outreach projects.
13 While these activities are presently focused on climate variation and its impacts, it is
14 quite feasible to prepare materials and perform outreach to those in need of climate
15 change information specifically tailored to region and sector. Rather than invent a new
16 federal-level program to perform outreach at regional and local levels, the CCSP
17 components can provide materials to RCCs and SCOs and resources for expanded
18 outreach efforts.

19 **STEVEN D. HILBERG AND MICHAEL A. PALECKI, ILLINOIS STATE**
20 **WATER SURVEY**

21
22 Page 149, Chapter 13: Chapter 13 stresses how reaching out to stakeholders is key to
23 realizing an effective climate change science program. This is extremely important.
24 After all, climate science and global warming are extremely significant public topics -
25 subject to intentional and unintentional misdirections, interpretations, and assumptions.

26
27 We need strategic outreach campaigns to identify our communication objectives, identify
28 our stakeholders, develop our stakeholder messages, and communicate our climate
29 science messages.

30
31 To kick off the outreach effort, CCSP will probably concentrate on the scientific
32 community, urban planners, government officials, transportation officials, utility leaders,
33 energy officials, and education leaders. These stakeholders will probably deserve early
34 attention. However, since this is such a significant public issue, we will also need to
35 reach out to the general public and use the public media to broadcast accurate
36 information.

37
38 For instance, television stations striving for program accuracy (e.g., The Weather
39 Channel, public television, and Discovery) will probably welcome the opportunity to
40 work with CCSP scientists. We can reach out to these reporters to communicate
41 appropriate, factual information.

42
43 News reporters will also cover the climate science agenda and, more often than not, will
44 want to convey factual information. We need to make sure we establish ongoing
45 relationships with identified reporters.

46

Comments on Chapter 13

1 At the same time, Hollywood and the general entertainment industry will produce
2 programs that will probably distort real science in the name of entertaining the public.

3
4 How can we best step into this processes? Can we offer real scientific expertise that will
5 improve such shows and impart - even to a limited degree - scientific accuracy to the
6 mass market media? (Just look at the inaccurate movies that regard biologic warfare,
7 nuclear energy, and meteorology. A large segment of the general public obtains its
8 information from these entertainment vehicles.)

9
10 By making scientific experts available to the entertainment industry, we will have the
11 opportunity to improve these vehicles.

12
13 Other misinformation may come from journalists who may report inaccurate data,
14 organizations that have their own agendas, or other poorly informed parties.

15
16 We also need to reach out to these persons to convey accurate data. While we cannot
17 control their reporting methods, we can make sure they have access to factual
18 information.

19
20 Different stakeholders, of course, have different communication needs. For instance, a
21 research scientist does not require the same information as a gradeschool teacher or a
22 member of Congress. Chapter 13 notes two classes of stakeholders: 1) Parties directly
23 affected by climate information (e.g., policymakers) and 2) Parties that deliver climate
24 information (e.g., news media contacts).

25
26 SUGGESTION: We need to identify all stakeholders - or stakeholder groups - included
27 in these two classification categories. We can then categorize them by their levels of
28 interests and information needs.

29
30 By accurately identifying our stakeholders, we can more effectively identify their
31 information needs, assemble appropriate information, configure outreach methods,
32 disseminate factual information, and measure the effectiveness of our communications
33 programs.

34
35 Reference: "What Motivates Stakeholders?" Communication World (February/March
36 1997), International Association of Business Communicators, S. V. Price - see
37 attachment summary or <http://www.wpi.org/rcpi/asp/audienceslist.asp> ("Price" in
38 alphabetical order)

39
40 SUGGESTION: We need to create stakeholder databases using the names gathered. We
41 can then deliver appropriate pieces of information (e.g., electronic or hard-copy) to
42 satisfy initial requests. We could also provide information updates at later dates.

43
44 For instance, if a news reporter needs basic information to complete an article on global
45 warming trends, we could document his request, provide data to satisfy the immediate

Comments on Chapter 13

1 need, and send additional data - perhaps regarding CO2-equivalent mitigation measures -
2 that might become available in coming months.

3
4 Such a system would ensure the timely, ongoing flow of information.

5
6 SUGGESTION: We need to document the complete flow of climate science information
7 from federal agencies to stakeholders.

8
9 This could include news articles, news releases, on-camera interviews, Web sites,
10 brochures, school texts, and other items. By documenting the information that federal
11 agencies deliver, we can have a good handle on the public education process and monitor
12 our official information products.

13
14 The objectives behind this are to provide stakeholders with appropriate information
15 materials and document the information we deliver. Also, this will ensure that the
16 federal government provides factual and approved climate science information (rather
17 than unapproved information that could be hearsay, theoretical, or otherwise not
18 appropriate for release).

19 **PRICE, RSVP COMMUNICATIONS**

20
21 Page 149, Chapter 13: First Overview Comment: It is surprising that this chapter makes
22 no mention of how CCSP-funded research will be reported directly to researchers in the
23 scientific community. Specifically, there is no mention as to how research funded by the
24 CCSP will be disseminated in peer-reviewed scientific journals. Reporting in peer-
25 reviewed journals will be important so that climate change scientists can be kept up-to-
26 date on the most recent results on climate change and on the specific techniques used to
27 generate those research results. Reporting results in peer-reviewed journals is one of the
28 most effective ways that information can be exchanged among scientists. Perhaps an
29 academic peer-reviewed journal on climate change might be funded by the CCSP in
30 which original research can be published. This would allow a means by which scientific
31 progress might be made in a timely manner.

32 This chapter largely focuses on providing lay people with information on climate
33 change. However, it would be worthwhile to devote an entire section to "Disseminating
34 Information Among Climate-Change Scientists" in this chapter.

35 **-CALIFORNIA ENERGY COMMISSION**

36
37 Page 149 et seq: I urge that revision of this chapter make a clear distinction between data
38 provision and data interpretation, and that interpretation efforts be undertaken with the
39 sustained involvement and interaction of relevant professional or sectoral groups or
40 associations. Outreach directly from scientists to individual users, bypassing all the
41 normal channels of interpretation of news and research, is at least much more difficult,
42 and in fact may be suspicious and fruitless. Working with intermediaries who do this
43 constantly, and who have earned the trust of their constituents, is likely to be much more
44 cost-effective and also useful to the scientists, because these intermediaries can also
45 inform us about what is wanted, why, and how it is used.

46

Comments on Chapter 13

1 Overall, despite the excellent suggestions in some of the preceding chapters, some noted
2 above, this chapter ignores the whole need for co-development of information and
3 products, with the users and potential users. Outreach is already undertaken in many
4 areas; reinventing the wheel may be merely wasteful, but it could be even worse if it casts
5 doubt on sincerity or credibility. Co-development works to solve those problems; the
6 process is part of the product.

7 **WIENER, INDIVIDUAL COMMENTATOR**

8
9 Page 149: At the Pew Center, we believe strongly that the science of climate change has
10 progressed sufficiently to enable policy-makers to begin taking action to address climate
11 change. However, we also recognize that scientific uncertainties remain and that policy
12 development and implementation relies in part on the ability of policy-makers to have
13 access to quality, objective scientific information that is presented in a manner that they
14 can readily interpret, complete with clear statements on what the scientific community
15 does and does not know. This is not an easy task, as it necessitates understanding what
16 kind of information policy-makers desire and in what form they want it presented. Our
17 primary concern with the *Draft Strategic Plan* is whether or not the proposed
18 communication and outreach activities of the CCSP are appropriate for policy-makers at
19 the federal, state, and local level.

20
21 In Chapter 13 of the *Draft Strategic Plan*, four vehicles are specified for communicating
22 with national policy-makers:

- 23
- 24 • The annual *Our Changing Planet* report
- 25 • Congressional briefings on research results and program accomplishments (as
26 needed)
- 27 • A science and technology assessment report
- 28 • Information and briefings for international partners
- 29

30 Collectively, these activities appear quite insufficient for communicating with national
31 policy-makers about climate change. *Our Changing Planet* is simply an annual update
32 on research activities. Congressional briefings can be quite useful, but there is no
33 specification of how frequently such briefings would be conducted and on what topics.
34 The science and technology assessment report may be a potentially useful document, but
35 insufficient detail is provided on its purpose and contents to understand its role in
36 communicating with policy-makers. Briefings for international partners are also useful,
37 but it is unclear how such briefings would be relevant for domestic policy-makers.
38 Chapter 13 appears to describe few outreach activities specifically designated for policy-
39 makers that can convey the basic science of climate change, the implications of climate
40 change for the United States, and the costs/benefits associated with various potential
41 policy responses.

42
43 Fortunately, Chapter 13 is not a complete listing of policy-relevant deliverables within
44 the *Draft Strategic Plan*. Throughout the *Draft Strategic Plan*, a broad range of products
45 are described that would be of benefit to policy-makers, although much of the truly novel
46 aspects of the *Draft Strategic Plan* are confined to those activities outlined for the CCRI.

Comments on Chapter 13

1 Of particular interest is the development of scenarios and applied climate modeling to
2 examine the effects of different emission pathways and policies on the global climate
3 and, subsequently, the environment. This activity represents a significant step forward
4 for U.S. climate change research efforts, and hopefully will enable policy-makers to
5 consider the implications of various responses to climate change, particularly greenhouse
6 gas mitigation. The CCSP scenarios should be aimed at identifying possible short-term
7 greenhouse gas emissions or concentration targets other than the Administration's
8 currently stated intensity target. For example, scenarios should explore a variety of
9 options for reducing emissions in the upcoming decades to 1990 levels and below, and
10 whether current voluntary efforts are likely to generate such reductions or whether more
11 policy effort is necessary. In addition, scenarios should also explore long-term targets for
12 the stabilization of greenhouse gas emissions or concentrations, their implications for the
13 environment and economy, and the potential mitigation pathways consistent with those
14 targets. We find the proposed dialogues between stakeholders and scientists to be a
15 particularly important aspect of this endeavor, because such interaction helps to ensure
16 that the outcome of the scenario development and applied climate modeling is
17 representative of the needs of stakeholders. It appears as if the results of these exercises
18 will be communicated through multiple reports, at least one of which we hope will
19 specifically target policy-makers and can serve as a vehicle for discussing policy
20 responses to climate change, although clarification of such a report's contents would be
21 helpful.

22
23 In addition, the *Draft Strategic Plan* outlines a proposal for *State of the Climate* reports,
24 describing decadal-, centennial-, and millennial-scale changes. Currently, the National
25 Oceanographic and Atmospheric Administration produces brief annual assessments of
26 the national and global climate, and places present climate in a historical context. More
27 robust versions of such assessments would be helpful for policy-makers, particularly if
28 such reports can attribute present and historical climate variability and change to
29 particular natural and anthropogenic drivers. However, the *Draft Strategic Plan* does not
30 specify how many or how frequently the *State of the Climate* reports would be produced,
31 or whether such reports would do more than simply summarize past climate variability
32 and change.

33
34 The *Draft Strategic Plan* also indicates that a *State of North American Carbon* report will
35 be produced over the next 2-4 years. The study of the carbon cycle is important not
36 simply from a climate perspective, but also from a policy perspective. Carbon
37 management remains an important issue for industry as well as policy-makers who may
38 be interested in the potential to use carbon sequestration projects as a means of offsetting
39 carbon emissions, particularly if such offsets can be used in a domestic or international
40 carbon trading system. As a result, it is important that assessments of carbon
41 management within the United States also assess the ability for various carbon
42 management mechanisms to be incorporated into policy, such as an assessment of the
43 extent to which carbon management practices can be verified, potential for leakage, etc.

44
45 The interaction between air pollution and climate is another timely issue for policy-
46 makers. The *Draft Strategic Plan* indicates that three different reports will be produced

Comments on Chapter 13

1 in coming years, a *State of the Atmosphere: 2006* report that describes the status of
2 atmospheric phenomenon such as composition, ozone layer depletion, temperature,
3 rainfall, etc.; a policy-relevant assessment of intercontinental transport and climatic
4 effects of air pollutants; and an assessment of the potential interactions between air
5 pollution and climate for human health. Such reports will hopefully be of great benefit to
6 policy-makers interested in weighing the opportunities and trade-offs associated with
7 addressing air quality and greenhouse gas emissions.

8
9 Policy-makers are also interested in the implications of future climate change and
10 variability for natural and societal systems in the United States. The *Draft Strategic Plan*
11 indicates that additional work on the impacts of climate change will continue, with
12 proposed assessments of the implications of climate change for a broad range of U.S.
13 ecosystems and additional assessment of human health impacts (Chapters 3, 10, 11). In
14 addition, an assessment of the risk of future changes in climate extremes has been
15 proposed, which is undoubtedly of particular interest to policy-makers as well as other
16 stakeholders. However, it is unclear how much additional work will be performed in the
17 assessment of societal impacts (e.g., economic sectors, infrastructure, etc.) of climate
18 change. For example, Pew Center staff recently participated in a U.S. Department of
19 Transportation workshop on climate change impacts to U.S. transportation infrastructure
20 – a critical sector that has been previously overlooked in impact assessment. A
21 comprehensive understanding of the implications of climate change is necessary, which
22 necessitates continual improvements in the analysis of impacts to sectors previously
23 considered as well as the expansion of impact assessment into sectors that have been
24 previously overlooked.

25
26 In addition, we have concerns regarding how the impacts of climate change will be
27 communicated to policy-makers. The GCRP report, *Climate Change Impacts on the*
28 *United States: The Potential Consequences of Climate Variability and Change* (more
29 commonly known as the U.S. National Assessment), which was released in 2000,
30 provided a review of the potential impacts of climate change on the United States as a
31 whole, in addition to impacts on specific sectors and regions. This report represents the
32 most current and comprehensive assessment of the implications of climate change for the
33 United States, and has been an instrumental tool for communicating information on
34 climate change to policy-makers, the media, and the general public, and was the source of
35 much of the material within the Administration's 2002 *Climate Action Report*. In
36 addition, many of the findings of the *National Assessment* are supported by the Pew
37 Center's series of environmental impacts reports (available at www.pewclimate.org),
38 which were authored by prominent members of the scientific community. Given that the
39 *National Assessment* is one of the most important documents to emerge from the GCRP
40 to date, we cannot understand why the *National Assessment* was not mentioned in the
41 *Draft Strategic Plan*. In addition, we find nothing in the *Draft Strategic Plan* that
42 indicates that a similar assessment endeavor will be undertaken in the future to keep
43 policy-makers advised of the status of climate change research and consequences. These
44 are significant omissions on the part of the CCSP. We question whether past and
45 continuing controversy associated with the *National Assessment* has influenced the
46 manner in which the impacts of climate change will be communicated in the future.

Comments on Chapter 13

1 Clearly, policy-makers need the best information available regarding the potential
2 consequences of climate change to both natural and societal systems if they are to
3 effectively evaluate policy responses.

4
5 Thus, there appear to be a number of tangible components of the *Draft Strategic Plan* that
6 would be of great utility to policy-makers, although many of these are neglected in
7 Chapter 13, which indicates that Chapter 13 should be rewritten to provide a more
8 comprehensive review of the information policy-makers and the general public can
9 expect from the CCSP. We also encourage the CCSP to incorporate stakeholder
10 involvement in developing communication tools, such as reports and assessments to
11 ensure that the information provided is appropriate for the end-users. Furthermore,
12 although the products discussed above are important contributions, we question whether
13 or not any of these products provide a comprehensive assessment of the science, impacts,
14 and potential policy responses in a single product that targets policy-makers, which can
15 be readily updated periodically as new information becomes available. If the products of
16 the CCSP are too many and varied, we fear policy-makers will have difficulty in
17 acquiring relevant information necessary for policy decisions. Although we do not
18 necessarily endorse any particular model for communicating climate change information
19 to policymakers, clearly assessment reports such as those periodically conducted by the
20 IPCC, the *National Assessment*, and a number of reports by the National Research
21 Council (particularly the 2001 report, *Climate Change Science*) have been instrumental in
22 driving policy debate and development in recent years. We therefore encourage the
23 CCSP to consider options that would allow the synthesis of information across the
24 research activities of the GCRP and CCRI (including information on basic climate
25 science, impacts, and options for mitigation and adaptation and their implications) and
26 package this information in a way readily available to policy-makers.

27 **VICKI ARROYO AND BENJAMIN PRESTON, PEW CENTER ON**
28 **GLOBAL CLIMATE CHANGE**

29
30 Page 149: The minimization of the reference to the news media denies their all-important
31 role in ‘informing the Public’. This, I am sure was not deliberate – but more in order to
32 focus attention on those with ‘facts, and observations with respect to the National Climate
33 Change Research Program. **The unfortunate situation is that there is no way to put a**
34 **lid on the News Media** – in their constant hunt for negative sound bytes, and threatening
35 messages. Too often these are either based on mis-quotations or out-of-context quotations
36 of folks who are seeking more funding support through such news release actions, or in
37 order to sell newspapers and magazines. This is not, of course, limited to news media, but
38 has recently included some editorial gross over-statements in supposedly ‘scientific’
39 journals.

40
41 The solution to such erroneous reporting could involve a more professional level review
42 of research results by agency spokespersons – at weekly or monthly reviews, with an
43 archive that is made available to reporters, with relevant researcher’s contacts, for review
44 and comments before publication in news media.

45 Journal Articles are already scrutinized, sometimes by informed peers, but that system
46 has its own flaws. One must consider the diversity of opinions that surround any science

Comments on Chapter 13

1 topic – particularly the more complex, interactive subjects, of which climate issues are
2 only one example. Science is relatively immature, and the underlying knowledge base in
3 most complex systems is inadequate as yet for any sort of forecasts, unless the past is
4 well replicated, and representative on realistic time and space scales.

5 We are simply not there yet for earth’s fluid systems, and it may take another century or
6 more, including discovery of new sources of forcing, and linkages, in order to approach
7 climate forecasts in any adequate fashion for decision making on any economic scales.
8 Meanwhile, the focus should be on cleaning up human effluents and contaminants,
9 particularly those that are universal stressors, which would include increased energy use
10 efficiency, at a minimum, and cleaner energy source use in general.

11
12 One simple message that should be a prelude to any and all media/Public Education
13 outlets is: “Too Many People is the Real Problem, and Fewer People is the Only Real
14 Solution.”

15 **GARY D. SHARP, CENTER FOR CLIMATE/OCEAN RESOURCES** 16 **STUDY**

17
18 Page 149, Chapter 13: The chapter as drafted “covers the bases” at a theoretical level but
19 provides little detail about how to accomplish the specified goals of improvised
20 coordination, reporting and outreach; accounting for the needs of stakeholders, and
21 integrating public information and outreach considerations at an early stage. (These goals
22 were derived from scattered text in the introductory paragraphs.) A plan for reporting and
23 outreach of such a complex program with multiple audiences needs to specify
24 mechanisms for outreach (along with responsibilities of researchers, agencies, and the
25 CCSP), the extent of coordination and management (including concerns about
26 censorship), and ways to evaluate the effectiveness of reporting and outreach. There are
27 many templates or guidelines for developing a communication/outreach plan, but they all
28 specify the following:

- 29
- 30 • Statement of purpose or objectives of the plan
- 31 • Prioritized identification of key audiences
- 32 • Communication goals
- 33 • Communication strategies, including media relations, staff communication,
34 promotional materials, public outreach, publishing services & records
35 management, and technical information and dissemination.
- 36 • Funding/resource requirements
- 37 • Progress reporting and evaluation (i.e., ways to know if goals are being
38 accomplished and periodic assessment)
- 39 • Long-term development of plan to meet communication needs.

40 This chapter lacks convincing detail about how it will implement its rather boilerplate
41 goals.

42
43 The chapter also does not deal with the tough issues of (1) providing information versus
44 policy advocacy and (2) two-way communication, i.e., inviting and responding to input
45 from stakeholders. With regard to the first issue, the tension exists and cannot be ignored
46 or “solved” by creating rules or categories; expert judgment must play a major role in

Comments on Chapter 13

1 determining the difference and simultaneously avoiding censorship. With regard to the
2 second issue, people often have needs other than those defined for them and often make
3 use of the information given to them in surprising ways. For both issues, the role of the
4 media, particularly science writers, needs to be explored and planned collaboratively with
5 them.

6 **ELIZABETH L. MALONE, JOINT GLOBAL CHANGE RESEARCH**
7 **INSTITUTE, PACIFIC NORTHWEST NATIONAL LABORATORY**

8
9 Page 149, Chapter 13, Introduction: Overall goals for reporting and outreach should be
10 spelled out, then guide the rest of the chapter organization.

11 **ELIZABETH L. MALONE, JOINT GLOBAL CHANGE RESEARCH**
12 **INSTITUTE, PACIFIC NORTHWEST NATIONAL LABORATORY**

13
14 Page 149, Chapter 13: It would help to define the terms “reporting” and “outreach.” For
15 example, does reporting mean one-way descriptions of results of climate change science
16 research, with no feedback or interaction invited or expected from those being reported
17 to? Does outreach imply something broader and more interactive, such as
18 communicating about and discussing the purpose, approach, results, recommendations,
19 and implications of climate change science research? Specifically, is there an
20 opportunity for feedback from stakeholders that could end up changing some aspect of
21 the research in progress, or is this comment period on the research plan considered the
22 only opportunity for stakeholder feedback, and thus any outreach would be strictly
23 reporting on progress, results, and policy decisions made?

24
25 I recommend including an evaluation component to determine the effectiveness of
26 reporting and outreach and to make ongoing improvements. How will you know that
27 stakeholders, especially decisionmakers, are getting the information they need and that
28 the climate program wants to get across? How will you measure that? How will
29 stakeholders know that their comments, feedback, and questions are being factored into
30 ongoing climate change research (if appropriate)? Is there a way to make mid-course
31 corrections or improvements consistently in communication methods and activities across
32 agencies?

33 As written, this chapter suggests that the science research results that are being
34 communicated constitute the only information people need to understand climate change,
35 form opinions, make decisions, and take action. It should be acknowledged that science
36 is one contributor to decision making, and that other factors (political and business
37 interests, U.S. relationships with other countries, federal and state budgets, etc.) also play
38 a part. It should also be acknowledged that there are different points of view among
39 scientists themselves (as well as agencies) and how those are dealt with and
40 communicated by this research program.

41 **ANDREA MCMAKIN, PACIFIC NORTHWEST NATIONAL**
42 **LABORATORY**

43
44 Page 149, Chapter 13: The entire section of the draft Strategic Plan on “Communication,
45 Cooperation, and Management” appears to be sort of a last-minute, tacked on
46 afterthought; and, as currently drafted, Chapter 13 is little more than a place-holder. The

Comments on Chapter 13

1 subject is vitally important; and, as Chapter 4 indicates so powerfully, it is at the heart of
2 assuring that the substantial national investment in climate change science pays off for
3 U.S. society.

4 What we have here now is little more than a collection of politically correct generalities,
5 with no real strategy whatsoever, especially for the kinds of consultative processes and
6 stakeholder interactions that are called for by Chapter 4.

7
8 The challenge, it seems to me, is to come up with a vision of what the chapter *should* be
9 as one starting point for revising and strengthening it. In my view, the chapter should
10 include the following kinds of discussion:

- 11 (1) A review of Congressional mandates and administration policies regarding
12 reporting and outreach (a rewrite of what is here now).
- 13 (2) An overview of CCRI and GCRP as to their commitments in the future to
14 reporting and outreach (a table or two?) – conspicuously missing in a presentation
15 that is in this draft essentially backward-looking rather than forward-looking.
- 16 (3) A clear presentation of what is going to be done, by whom, and with what
17 supporting resources – probably reflecting some of the parts of this draft
18 (outreach to relevant parts of the federal government, outreach to regional and
19 sectoral resource managers, and outreach to the general public, including
20 educational users), but with more specifics about deliverables and supporting
21 resources.
- 22 (4) In particular, if Chapter 4 is not going to include a description of the *how* of
23 external consultation in identifying potential policy questions and issues,
24 involving stakeholders in scenario development, etc., those issues should be
25 addressed in this chapter.

26 **THOMAS J. WILBANKS, OAK RIDGE NATIONAL LABORATORY**

27
28 Page 149, Chapter 13: Given global climate change's status in the public eye, I think that
29 ways ought to be found to use it as a case study in how science is done, in order to impart
30 scientific literacy to the population in general. When people find out that I study
31 greenhouse warming, most of them instinctively ask, "Is it real?" Usually they have
32 some vague idea that there are observations that point to it, which may or may not be
33 statistically significant. More remote for the layperson are such things as the difference
34 between weather and climate, the meaning of statistical significance, and the use of first
35 principals-based modeling. Probably the greatest challenge is to get the intelligent
36 layperson to believe that observations and modeling, if not in exact agreement, are
37 generally interacting to bolster each other's results. As J. Shukla said a few times at the
38 meeting, no one has come up with a reasonable model to show that greenhouse gases do
39 not warm the world. Therefore, even the most ardent of the informed greenhouse
40 warming skeptics have gone beyond "Is it for real?" to "How much?" and "Does it
41 matter?"

42 **BRENT LOFGREN, NOAA/GLERL**

43
44 Page 149, Chapter 13:

Comments on Chapter 13

1 First Comment: The emphasis in Chapter 13 on the need to improve coordination,
2 reporting, and outreach activities among the federal agencies is explicit, however, details
3 pertaining to a "plan" are rather vague.

4
5 Second Comment: Chapter 13 appears to provide significant detail on activities within
6 the agencies, but not much is said about an inventory of the products, what they are or
7 should be.

8
9 Third Comment: Might there be a need to monitor and quantify who actually makes up
10 the user community after the plan has been implemented?

11
12 Fourth Comment: The plan should incorporate a mechanism to track the exchange and
13 effectiveness in reporting and outreach activities.

14 **SONJA B. JONES, OAK RIDGE NATIONAL LABORATORY**

15
16 Page 149, Chapter 13: One summary speaker, during the afternoon of November 5,
17 stressed the difference between "data and information." When a WEB site reader has to
18 infer how certain data apply to his/her resource, there is a high probability that some key
19 "take-home" messages will not be grasped. WEB sites designed for certain natural
20 resources audiences should convey information, not data. A panel member correctly
21 noted that research scientists, and even research managers, do not perceive "outreach" as
22 their role. This is true in many cases, and if it persists, we will all suffer as a result.

23
24 Based on my experience with the National Assessment, I know that summary/translation
25 documents cannot be left to writers, editors, policy analysts, or politically appointed
26 coordinators to prepare. They will simply not get everything right. Scientists have to
27 review those documents very closely for accuracy. This aspect of "outreach," even if
28 outside of one's perceived role, has to be shouldered by all scientists.

29 Another point deals with incentives. Federal scientists under "research grade evaluation"
30 are not rewarded for liaison work with land managers. In spite of the fact that such work
31 is badly needed, or that some agencies may encourage it, or that some scientists would
32 like to do more of it, decades old OPM standards thwart such activity. When it comes
33 time for work evaluations, Federal scientists are rewarded for research and penalized for
34 outreach. Such disincentives may extend to academia as well. Based on present societal
35 needs, such a system seems rather absurd.

36
37 Another critical point follows. "Information developed by the CCSP will be used by
38 decisionmakers in debating and selecting possible strategies to mitigate and adapt to
39 global change without unnecessarily compromising the economy or energy security."
40 Such statements reflect a predetermined policy. Policy should not drive research. For
41 alternative views, see Di Castri, F. 2000. Ecology is a context of economic globalization.
42 BioScience 50(4):321-332; James, A., et al. 2001. Can we afford to conserve
43 biodiversity? BioScience 51(1): 43-52. By contrast, there is not enough in the draft
44 strategic plan about the potential impacts to America's natural resources (e.g., wildlife,
45 forests), critical consumptive resources (e.g. water, food) or other key societal concerns

Comments on Chapter 13

1 (e.g., human health). Such links were vividly portrayed in various documents produced
2 by the National Assessment.

3 **CRAIG SHAFER, NATIONAL PARK SERVICE**

4
5 Page 149, Chapter 13: As a participant in the Outreach Session focused on Chapter 13, I
6 made comments following the formal presentations by panel members. A summary of
7 these comments is presented below.

8
9 1.) While the outreach chapter in the draft document is fairly shallow and lacks detail (the
10 chapter is only 5 pages long), I feel the panel did an excellent job providing the level of
11 detail and direction needed in the next version. Hopefully, most of the panelists'
12 suggestions can be incorporated into an expanded chapter.

13
14 2.) While it is great to see a separate outreach chapter in the draft document, in reality the
15 outreach effort must be incorporated throughout the entire document, becoming an
16 essential piece of each chapter. The failing of having a stand-alone chapter is that
17 participants in the other areas of research and development within the CCSP may assume
18 that any outreach efforts associated with their activities will be covered by the outreach
19 team. As Berrien Moore suggested in his Moderator's comments at the end of the
20 morning Workshop on December 5th, a selection of cross-cutting themes should be
21 developed for the key activities within in the CCRI and USGCRP efforts. Outreach
22 should be one of these cross-cutting themes.

23
24 3.) Effective outreach requires selecting a group of scientists who can effectively
25 communicate the complexities of the many data sets produced by participants in the
26 CCRI/USGCRP activities into meaningful information. Most scientists do not like to do
27 this (largely because they are not good at it), but there are some who are very effective
28 conveyors of information. They should be very actively involved in the entire outreach
29 effort for the CCSP.

30
31 4.) Educating the K-12 students is an essential part of outreach, and should be handled
32 separately from outreach to decision makers and the general public. When you educate
33 K-12 students, you also educate their families, creating an important "multiplier effect."
34

35 5.) Effective K-12 educational materials must be Standards-based, and meet teachers'
36 (and their students') needs. A dedicated strategy for developing and propagating an
37 effective K-12 outreach effort will be needed. Effective outreach just doesn't "hsppen," it
38 must be planned.

39
40 6.) Adequate funding levels need to be made available to support an effective outreach
41 effort. Too often, Federal Agencies relegate outreach efforts to activities to be done if
42 there is money left over at the end of a research project. Outreach within the CCSP effort
43 must be supported from the beginning, at an adequate level, so that the outreach can have
44 a real impact on decision makers, the public and the K-12 classroom.

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1 7.) Establishing a Web site is not a very effective outreach tool. Most teachers have
2 neither the time nor the energy to search the Web and develop effective learning tools
3 from Web-based materials. To effectively utilize the Web, an accompanying set of
4 educational support materials, designed for teachers at varying grade levels, must be
5 developed.

6
7 8.) Finally, the most effective outreach occurs at the local (regional) level. A centralized
8 national effort will not be very effective, and the CCSP must engage local teachers and
9 scientists in the outreach process.

10 **ROCK, UNIVERSITY OF NEW HAMPSHIRE**

11
12 Page 149, Chapter 13: This chapter would benefit by integration with technical chapters
13 involving data management (e.g., Chapter 3). Data should be considered an integral part
14 of the reporting and outreach component of CCSP, especially for the K-12 community.
15 Many users in that community will want access to the data themselves, as well as fact
16 sheets, etc. Because their level of sophistication, and access to computing and data
17 management tools, will be lower than for the traditional university- and laboratory-level
18 research community, data products should be managed with those needs in mind - e.g.,
19 user-friendly web interfaces for user-defined data visualization. Thus, there may need to
20 be a range of "looks" for data, to appeal to a range of users.

21 **ROBERT M. CUSHMAN, OAK RIDGE NATIONAL LABORATORY**

22
23 Page 149, line 3: The most important outreach effort of the USGCRP has been the US
24 National Assessment process (so the activities at the regional, sectoral, and national
25 levels). These should be described and built upon, especially as the USGCRP Act
26 mandates assessments as a reporting and communication mechanism.

27 **MICHAEL MACCRACKEN, LLNL (RETIRED)**

28
29 Page 149, line 7: **(55-SP)** "risks and opportunities". Excellent! This underscores the
30 relevance of my comment #19 above.

31 **HP HANSON, LANL**

32
33 Page 149, Line 18: The CCSP should explain what the "near-term products"
34 are, or should direct the reader to the where those products are listed and
35 defined.

36 **SONJA B. JONES, OAK RIDGE NATIONAL LABORATORY**

37
38 Page 149, Line 25: **Inventory of Existing Agency Activities:** Because of the many
39 agencies and stakeholders involved in this work, a communication plan should be
40 required. The plan should describes each agency's role in communicating and reviewing
41 information before it is communicated, as well as which agency or group has the has
42 ultimate responsibility and accountability (CCSP?). The plan should include a
43 description of each stakeholder type and that organization/group/individual's information
44 (and decision making, if appropriate) needs. Not just generally stated needs, as under the
45 section, "Reporting and Outreach for Decisionmakers," but down to the level of what
46 kind of specific information they need/want, when, and in what form. A schedule of

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1 high-level communication activities and products should be required, at least a year at a
2 time, perhaps with less specificity in out years and revised annually.

3 **ANDREA MCMAKIN, PACIFIC NORTHWEST NATIONAL**
4 **LABORATORY**

5
6 Page 149, Line 25, through Page 151, Line 40

7 “Reporting and Outreach” is where the products of the entire CCSP reach the public and
8 the political process. The result is climate change policy, which can range from inaction,
9 to actions such as the Kyoto Protocol, to proposals for drastic reductions in greenhouse
10 emissions.

11
12 That policy continuum has been very ill-served in recent years, due principally to deeply
13 flawed outreach to the professional community. In order to improve the credibility of
14 federal outreach, we support establishing a “Reporting and Outreach Oversight
15 Committee” (ROOC), as described herein.

16 **Horner, CEI**

17
18 Page 149, Line 25, through Page 151, Line 40

19 The reasons for the establishment of this “ROOC” Committee are numerous, some of
20 which are manifested in the CCSP proposal itself. As the proposal notes, much of current
21 outreach has been carried out through the USGCRP. This will likely continue in the
22 future.

23
24 While it has probably been the most important federal reporting and outreach apparatus
25 on climate change in recent years, USGCRP has been exposed through litigation and the
26 Freedom of Information Act to be perhaps the most biased office addressing climate
27 change in the entire federal apparatus. This occurred because senior management has
28 largely been composed of people with fairly uniform, extreme views on climate change.
29 This may stem largely from the fact that very little of that senior management consisted
30 of trained atmospheric scientists. Instead, selection of that management was a political
31 decision undertaken by the previous Administration and that management left in place a
32 similarly extremist infrastructure.

33
34 Consequently, in order for CCSP Reporting and Outreach to meet a more normal
35 standard for balance, the entire USGCRP staff must be examined for balance by the new
36 ROOC. As a start, ROOC should order USGCRP to sever relations with previous
37 employees who are now serving as consultants, or to ask for letters of resignation which
38 will allow for further consideration after re-evaluation. [See explanation in large part of
39 the necessity of this step, at CEI letter to Adm. Vice Admiral Conrad C. Lautenbacher,
40 Jr., Under Secretary for Oceans & Atmosphere and Dr. James R. Mahoney Assistant
41 Secretary for Oceans & Atmosphere (18 October 2002), found at
42 <http://www.cei.org/gencon/027,03333.cfm>].

43
44 A persuasive body of evidence exists of the bias and radical nature of the recent
45 USGCRP.

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1 **HORNER, CEI**

2
3 Page 149, Line 26: Inventory of Existing Agency Activities" section Page 149, Lines 26-
4 27 This section notes that there is no one office to assess interagency outreach efforts
5 and subsequent language (lines 25-26) states such a need.

6
7 SUGGESTION: Form an interagency office (possibly under the Climate Change Science
8 Program) that will monitor and coordinate climate science outreach efforts to categorized
9 stakeholders.

10 **PRICE, RSVP COMMUNICATIONS**

11
12 Page 150, Line 5. The “monthly Congressional seminar series”, was profoundly one-
13 sided, consisting largely of scientists who were in agreement with the more lurid view of
14 climate change. Scientists with different views were either completely absent from the
15 list of speakers, or were only allowed to present if there was opposing “balance”. That
16 “balance” was highly selective, while those championing the lurid view of climate
17 change were unopposed.

18
19 This would never have occurred in USGCRPs funding were vetted through a ROOC-style
20 committee.

21
22 °The USGCRP coordinated production of the 2000 “National Assessment” of the
23 potential effects of global warming, which gave rise to much of the subsequent “Climate
24 Action Report” released in 2002. In the Assessment, USGCRP chose to flout the normal
25 ethic of science, in which models must conform to observations before they can be used
26 to determine effects with any credibility.

27
28 USGCRP’s contravention of scientific norms resulted in litigation under numerous
29 statutes, an FDQA petition to cease dissemination of the Climate Action Report and
30 National Assessment, as well as a hearing by the congressional committees, both during
31 its development and a subsequent inquiry by the House Oversight and Investigations
32 Subcommittee in 2002. Again a ROOC-overseen USGCRP would not have committed to
33 such a biased seminar series or such a scientifically controversial attempt at a National
34 Assessment.

35
36 Reporting and Outreach problems on climate change have not been confined to
37 USGCRP. In fact, they are endemic in virtually every large federally-funded entity
38 involved. That is largely because of the nature of the scientific community, discussed
39 briefly below. Once this nature is recognized, corrective administrative measures, such
40 as creating of the ROOC, can be taken to counter its inherent bias.

41 42 **Understanding the Sociology of Global Change Science**

43 How could the scientific community have accepted the bias of the Seminar Series and the
44 National Assessment, and what does this portend for the future? That community

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1 encouraged excesses. And, unless CCSP management is cognizant of the sociology of
2 global change science this tendency will continue or even worsen.

3
4 Dramatically increasing the research budget for global climate change, as is proposed in
5 the current document, not only rewards past misfeasance but increases the pressure on
6 scientists to accentuate negative aspects of climate change and to display the issue
7 without balance. This is a natural product of the reward structure for academic research,
8 which is largely predicated upon the amount of federal funding that a scientist brings to
9 his University. Equivocal “problems” do not merit \$4 billion per year in a federal market
10 where health care, environmental, and social concerns compete for funding. Only those
11 presented in the most lurid fashion receive funding.

12
13 Threatening that funding stream places the individual scientist at a disadvantage
14 compared to others competing for a finite federal outlay. Consequently, the CCSP must
15 be aware that the science community, in general, will react negatively to members who
16 may question the severity of environmental issues that are receiving substantial funding.

17
18 CCSP needs to actively counter this tendency by making Reporting and Outreach support
19 to USGCRP and other applicants contingent upon a demonstrated diversity of reasonable
20 scientific outlook. This was clearly lacking in the committee that directed the National
21 Assessment. A Reporting and Outreach Oversight Committee, such as that detailed
22 below, would have encouraged a proper diversity.

23
24 Interestingly, there is another large community of climatologists not as inherently biased
25 toward the lurid on climate issues as many Federal entities, and has substantial
26 experience in Reporting and Outreach on climate science. This is the American
27 Association of State Climatologists (AASC), a scientific society of about 200, including
28 State Climatologists and their professional staffs. Perhaps they are less strident because
29 these individuals serve daily as the interface between climate issues and the public,
30 requiring quotidian hand-on experience with weather data and the impact of climate.
31 Daily immersion in this activity can lead to the conclusion that the climate world, in fact
32 is not coming to a rapid end, but rather that there is a great deal of social adaptation that
33 takes place. Whatever the reason, this community tends to be much less alarmist on the
34 climate change issue than the USGCRP and other federal organizations, and it is also
35 very effective at public communication.

36
37 Other public commentary on CCSP, submitted by Roger Pielke, President of the
38 American Association of State Climatologists, makes it quite clear that AASC is very
39 willing to lend its expertise to CCSP, particularly in the areas of climate impacts and
40 proper communication of science, and in communicating the limitations of climate
41 science. In its CCSP commentary, AASC notes:

- 42
43 • Human activities have an influence on the climate system. Such activities,
44 however, are not limited to greenhouse gas forcing and include changing
45 land cover and aerosol emissions, which further complicated the issue of
46 climate prediction. Furthermore, climate predictions associated with

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1 human disturbance of the climate system have not demonstrated skill in
2 projecting future variability and changes in such important climate
3 conditions as growing season, drought, flood-producing rainfall, heat
4 waves, tropical cyclones and winter storms. These types of events have a
5 more significant impact on the United States than annual global
6 temperature trends.

7
8 A search of USGCRP outreach documents reveals no analogously unequivocal statement
9 about the limitations of climate science. This alone argues for active inclusion of AASC
10 in the Reporting and Outreach activities of the CCSP.

11
12 Further, AASC notes:

13
14 • General circulation models which have been applied to project changes in
15 global and regional climate for periods of decades into the future need to
16 be viewed as hypotheses about the behavior of the atmosphere in response
17 to human disturbance. The validity of such models is uncertain because
18 our understanding of all relevant climate factors (and their relationships
19 and interactions) is incomplete. New research should be based only upon
20 hypotheses that can be verified by observed data. This underscores the
21 need to continue (and, in fact, enhance) the long-term climate monitoring
22 system in the United States so that, for example, climate models can be
23 properly tested.

24
25 At the December Planning meeting for the CCSP, USGCRP consultant (and former
26 coordinator for the National Assessment) Michael MacCracken argued that testing the
27 GCMs that were used in the Assessment on observed temperatures over the United States
28 during the period of greenhouse enhancement was not appropriate. The fact that
29 USGCRP is at such variance with AASC, whose leadership is certainly on a scientific par
30 with USGCRP, indicates there is a vigorous debate over what scientific information may
31 appropriately be presented to the public.

32 The disparity of informed scientific opinion is *prima facie* evidence for the need for
33 enhanced scientific diversity in important Reporting and Outreach activities of the CCSP.

34 35 **Specific Recommendations**

36 •CCSP establish a “Reporting and Outreach Oversight Committee” (ROOC) specifically
37 designed to be inclusive. Membership should be from the scientific, environmental and
38 industrial communities, with special attention paid to the fact (noted above) that the
39 scientific community is itself economically biased towards exaggeration of funded or
40 potentially funded environmental threats.

41
42 •Because of their scientifically controversial nature stemming from lack of appropriate
43 oversight diversity, ROOC should request removal of the “National Assessment” from
44 USGCRP communications as well as a web submission explaining why it had to be
45 removed; in addition to the FDQA reasons detailed, *supra*, is the fact that **the supposed**
46 **NACC of October 2000 failed to comply with the statutory list of areas to be**

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1 **explored, thus not qualifying and leaving USGCRP to still have not presented a**
2 **NACC, over a dozen years after the statute's passage.**

3
4 •Because it is largely based upon the National Assessment, Chapter 6 of the Climate
5 Action Report-2002 should similarly be withdrawn by its publisher, the Environmental
6 Protection Agency, along with appropriate explanatory literature.

7
8 •All federal funding disbursed through the CCSP for Reporting and Outreach must be
9 approved by that Committee. The Committee will attach particular importance to the
10 scientific and policy diversity that resides in any organization whose funding it oversees.

11
12 •As a centerpiece of CCSP Reporting and Outreach, the ROOC coordinate the staffing
13 and development of a new or, actually, **First** "National Assessment" of potential effects
14 of climate change on the United States, superceding the unlawful version; in addition, the
15 next "Climate Action Report" should contain text on the impact of climate change based
16 upon the new Assessment. ROOC should enlist a much more diverse coordinating staff
17 for the new Assessment, in particular including the expertise of the American Association
18 of State Climatologists.

19 **HORNER, CEI**

20
21 Page 150. Line 10. In the section on "Multilateral International Cooperation...." mention
22 should be made of the PICES program. Below I provide information. Research that is
23 collaborative and cooperative is carried out by academic oceanographers and federal
24 fisheries scientists from six nations around the North Pacific Rim. All of the activities
25 are coordinated by the PICES program office, located in Victoria, British Columbia.

26
27 PICES is the acronym for the North Pacific Marine Science Organization, an
28 intergovernmental scientific organization that was established in 1992. Its present
29 members are Canada, People's Republic of China, Japan, Republic of Korea, Russian
30 Federation, and the United States of America. The purposes of the Organization are as
31 follows:

- 32
33 (i) Promote and coordinate marine research in the northern North Pacific and
34 adjacent seas especially northward of 30 degrees North;
35 (ii) Advance scientific knowledge about the ocean environment, global weather
36 and climate change, living resources and their ecosystems, and the impacts of
37 human activities;
38 (iii) Promote the collection and rapid exchange of scientific information on these

39 issues.

40 An annual meeting is convened and the venue rotates among each host country. Most of
41 the work takes place in inter-sessional workshops and at the PICES office itself in
42 Canada. One activity that should be highlighted is that PICES is developing a North
43 Pacific Ecosystem Status Report. This report will periodically review and summarize the
44 status and trends of the marine ecosystems in the North Pacific, and consider the
45 processes that are causing or expected to cause change in the near future.

46

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1 PICES also has an active climate change program known as 4-C's (Climate Change and
2 Carrying Capacity) which seeks to determine how climate change will impact marine
3 resources in coastal waters around the Pacific Rim and in the open North Pacific Ocean.

4 **BILL PETERSON, NOAA/FISHERIES**

5
6 Page 150, Lines 25-28: "...there is a need to survey the federal agencies" and "A strategy
7 is needed for allocating responsibilities and ensuring participation," but who will conduct
8 the survey or allocate responsibilities is unknown. (The CCSP seems to be on the hook
9 for ensuring participation, but even this is a bit vague.)

10 **ELIZABETH L. MALONE, JOINT GLOBAL CHANGE RESEARCH**
11 **INSTITUTE, PACIFIC NORTHWEST NATIONAL LABORATORY**

12
13 Page 150, Lines 25-26 This section advises the need to "facilitate outreach without
14 duplicating efforts."

15
16 SUGGESTION: This needs clarifying. Delivering information is necessarily a
17 redundant task. The same messages need to be repeated, repeated, and repeated. While
18 we should always stay on message and never be contradictory, duplicating information
19 from different federal agencies is a good thing.

20 **PRICE, RSVP COMMUNICATIONS**

21
22 Page 150, line 25: Actually, the survey should reach much beyond the federal agencies,
23 including the public, industry, etc.

24 **MICHAEL MACCRACKEN, LLNL (RETIRED)**

25
26 Page 150, lines 28-31: Does this indicate that no agency can put out anything without
27 interagency approval? There is nothing here on what the review process should be. Such
28 tight control should be eliminated—the science should be freely released.

29 **MICHAEL MACCRACKEN, LLNL (RETIRED)**

30
31 Page 150, Line 32: Add paragraph "Finally, within this effort to facilitate interagency
32 coordination, the CCSP will also integrate previous outreach efforts, information sources,
33 and existing contacts so as to not duplicate previous research or outreach program
34 initiatives. The CCSP aims to build upon existing knowledge and outreach bases by
35 recognizing the valuable work that has been done in the past. The CCSP outreach and
36 reporting strategy of cooperation recognizes the importance of maintaining relationships
37 with stakeholders who have been involved in climate change assessments and reporting
38 in the past at the national, regional, and local levels."

39 **EESI, CAROL WERNER, JR DRABICK,**

40
41 Page 150, Line 33: The section woefully lacks any strategies to "*consult* with actual and
42 potential users" (emphasis added) as required by the Global Change Research Act.
43 Rather, it specifies information dissemination strategies, as though simply providing
44 research results to national policymakers, the international community, and local-regional
45 entities suffices.

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1 **ELIZABETH L. MALONE, JOINT GLOBAL CHANGE RESEARCH**
2 **INSTITUTE, PACIFIC NORTHWEST NATIONAL LABORATORY**

3
4 Page 150, Line 33 Under reporting and outreach for decision makers, the CCSP should
5 build on some of the lessons that have been learned from NOAA-OGP's RISA (Regional
6 Integrated Science and Applications) program. An effective regional climate service
7 function must embody researcher/stakeholder partnerships over the long term, and have
8 an identifiable, credible regional institutional home, and be sustained over the long term.
9 This section needs to be rewritten, and embody the lessons from the first 5 years of the
10 RISA's.

11 **ROGER C. BALES, UNIVERSITY OF ARIZONA**

12
13 Page 150, Line 33: **Reporting and Outreach for the Public:** The discussions about
14 media suggest that agencies communicate information "unvarnished" through the media,
15 whereas in reality, reporters have a large degree of independence in what and how they
16 report. The communication plan should emphasize the development of relationships with
17 key science journalists and include ways to address erroneous, misleading, or negative
18 reporting when it occurs.

19 **ANDREA MCMAKIN, PACIFIC NORTHWEST NATIONAL**
20 **LABORATORY**

21
22 Page 150, Line 34-39: "Reporting and Outreach for Decisionmakers" section Page 150,
23 Lines 34-39 This section notes the need to reach out to decisionmakers recognized in
24 Chapter 4.

25
26 SUGGESTION: We should document decisionmakers under the first stakeholder
27 category. We need to identify their information needs and provide them with specific
28 information services (e.g., articles written for the scientific media, press releases, or
29 individual information products).

30 **PRICE, RSVP COMMUNICATIONS**

31
32 Page 150, Lines 34–39: *"Information developed by the CCSP will be used by*
33 *decisionmakers in debating and selecting possible strategies to mitigate and adapt to*
34 *global change without unnecessarily compromising the economy or energy security.*
35 *Decisionmakers as defined in Chapter 4 are those who are actively involved in policy at*
36 *the national and regional level and those who are making operational decisions for*
37 *natural resources based on climate information. Reporting and outreach for*
38 *decisionmakers are a priority for the CCSP."*

39
40 Besides being buried here, the first sentence also belongs in the beginning of the
41 document because it identifies the true purpose of the CCSP.

42
43 In any case, this sentence is vague in the following sense: Does the "without
44 unnecessarily compromising the economy or energy security" (as yet undefined and thus
45 prone to abuse) refer to the immediate consequence(s) of taking some action or to the
46 expected eventual consequence of taking no action? Conceivably, it could be necessary

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1 to “*unnecessarily compromis[e] the economy or energy security*” to prevent a climatic
2 future that “*unnecessarily compromis[es] the economy or energy security*” even more
3 than the no-action policy alternative. If this were the expectation, would the policy
4 decision then be that we would not act and just deal with whatever climatic future comes
5 as a result (i.e., we would adapt or else)?
6

7 While this may constitute science “informing” policy decisions, it constitutes the worst
8 example of it: Act on science advice if it favors what you want to do anyway or Ignore it
9 if it does not. Of course, this is not new; this is business as usual. But isn’t changing this
10 why we are going through this exercise with the CCSP in the first place?
11

12 In connection with this question, I recommend that the authors read both “International
13 Environmental Research and Assessment: Proposals for Better Organization and
14 Decision Making” (Carnegie Commission, July 1992) and “Science, Technology, and
15 Government for a Changing World” (Carnegie Commission, April 1993). Neither has
16 been implemented adequately, and thus both are still relevant.

17 **DAVID L. WAGGER, PH.D., SELF**
18

19 Page 150, lines 34-36: A really key omission here is that there is no reference to the
20 “environment”—is this intended as a policy decision by the Bush Administration?
21

22 **MICHAEL MACCRACKEN, LLNL (RETIRED)**
23

24 Page 150, lines 36-39: Here the report states that decision makers (one of the core sets of
25 stakeholders for climate outreach) are “those who are actively involved in policy at the
26 national and regional level and those who are making operational decisions for natural
27 resources based on climate information.” This definition is much more inclusive of sub-
28 national officials than the definition in Chapter 4 (referenced in line 36), as noted in the
29 first comment above on Chapter Four; that definition (page 38) limits decision makers to
30 those involved in setting policy at the *national* level. We urge that the definition used
31 here be applied throughout the report and that regional, state and local officials be
32 explicitly recognized as core stakeholders for reporting and outreach by the CCSP.

33 **KENNETH A. COLBURN, NORTHEAST STATES FOR COORDINATED
34 AIR USE MANAGEMENT (NESCAUM).**

35 Page 150, Line 37: Change sentence to “...involved in policy at the national, **regional,**
36 **and local levels** and those...”

37 Carol Werner, JR Drabick, EESI
38

39 Page 151, line 2ff: That there is nothing here on either the IPCC or the National
40 Assessments is inexcusable. I would note that the law under which the Program operates
41 requires that assessments need to be done.

42 **MICHAEL MACCRACKEN, LLNL (RETIRED)**
43

44 Page 151, Lines 2-10 This section notes that the Global Change Research Act mandates
45 disseminating information to foreign players.
46

Comments on Chapter 13

1 SUGGESTION: We should document foreign players under the first stakeholder
2 category. By using a detailed stakeholder tracking system, we can monitor information
3 products delivered to specific and general foreign parties.

4 **PRICE, RSVP COMMUNICATIONS**

5
6 Page 151, line 16. On an issue of this importance, a regular monthly or biweekly seminar
7 series to Congress as has occurred in the past (cf. page 150, line 5) is clearly appropriate,
8 rather than merely ‘as needed’. These briefings should include all USGCRP sponsored
9 research and should be prioritized based on relevance to decision making. Seminar series
10 should bring scientists and researchers to Washington, DC to allow decision makers the
11 chance to meet and hear directly about latest findings.

12 **JANINE BLOOMFIELD, ENVIRONMENTAL DEFENSE**

13
14 Page 151, Lines 16-20: The breadth of interest shown in Chapter 11 regarding how
15 agency works (e.g. determinants of adaptive capacity, improvements in use of
16 information), is largely lacking in this proposal which collapses the interface between
17 science and national policy making into briefings and reports, as if information transfer
18 rather than the development of a communication network were the real task. We suggest
19 the creation of a number of communications channels (e.g. at least one for each of the
20 boxes in the org chart), each of which is treated as a hypothesis or at least as a device to
21 be evaluated in terms of its ability to move information relevant to the mission of each
22 governance structures (as described on pp. 162-163) in both directions, thereby
23 facilitating improved understanding between national decision makers and the research
24 community. The CCSP might establish a biennial Congress for Global Change Science
25 and Policy, modeled after the Seventh American Forestry Congress and other venues that
26 explicitly bring science and policy together under a single, albeit large, roof. The CCSP
27 might create a position for a Chief Knowledge Officer (as distinct from a Chief
28 Information Officer) whose task would be to manage these mechanisms. In any event, the
29 possibility, and even more narrowly, the scope, for serious participant-observation by
30 decision scientists (in lieu of more academic methods) is very great and ought to be
31 exploited by the CCSP.

32 **CALIFORNIA RESOURCES AGENCY**

33
34 Page 151, line 18. A science and technology assessment report is a crucial and extremely
35 important document for decision makers. This needs much more elaboration, there
36 should be a separate and detailed plan on such a technology assessment that outreach
37 should be one component of. As mentioned elsewhere in my comments there appears to
38 be an entire chapter missing on the basic science research needed in support of the
39 Climate Change Technology Initiative.

40 **JANINE BLOOMFIELD, ENVIRONMENTAL DEFENSE**

41
42 Page 151, line 20. In addition to Congressional briefings, regular briefings and monthly
43 or biweekly seminar series should be sponsored for the headquarters of USGCRP
44 agencies including NASA, NOAA, EPA, DOE, DOI, and USDA.

45 **JANINE BLOOMFIELD, ENVIRONMENTAL DEFENSE**

46

Comments on Chapter 13

1 Page 151, line 20. In addition to briefings and seminar series, printed and visual
2 materials should be produced for Congress and agency headquarters summarizing both
3 existing and highlighting new research results. Consultation with Congress and Agency
4 HQ staff should be on-going to prioritize which research results are of most relevance for
5 reporting.

6 **JANINE BLOOMFIELD, ENVIRONMENTAL DEFENSE**

7
8 Page 151, lines 22-41: This section constitutes the most explicit recognition of
9 subnational actors as key decision makers to this point in the report, but should cite states
10 (and possibly municipalities) explicitly, and should be moved to an earlier point,
11 preferably in the overview.

12 **KENNETH A. COLBURN, NORTHEAST STATES FOR COORDINATED**
13 **AIR USE MANAGEMENT (NESCAUM).**

14
15 Page 151, Line 28: Change sentence "...and climate variability. Most importantly,
16 decisionmakers require the full spectrum of relevant information to be able to make
17 informed decisions under uncertainty. The CCSP aims to provide timely information
18 regarding the scientific research and assessments performed previous to the CCSP as well
19 as under the CCSP. To facilitate this communication it is also required that researchers
20 understand how uncertainty is used in decisionmaking so that..."

21 **EESI, CAROL WERNER, JR DRABICK,**

22
23 Page 151, Lines 28-29: The way to discover how uncertainty is used in decision-making
24 (be it at the national or the regional level) is to participate in the decision-making venue,
25 not to study it as if it were a neuron. By doing so, one does end up learning what the
26 decision makers need (in fact, in a far better way than by any other method), but more
27 importantly the decisions are better informed.

28 **CALIFORNIA RESOURCES AGENCY**

29
30 Page 151, line 23ff: All of these groups will also want to know what global change will
31 mean to the environment—this is rather a basic aspect to include.

32 **MICHAEL MACCRACKEN, LLNL (RETIRED)**

33
34 Page 151, line 23ff: There is nothing here about supporting the overall assessment
35 process and agency interactions to make sure there is coordination of assessment
36 activities.

37 **MICHAEL MACCRACKEN, LLNL (RETIRED)**

38
39 Page 151, Lines 31-40: The last bullet is far more important than the preceding three and
40 ought to be the core of regional outreach: CCSP must create partnerships with states and
41 regional entities in order to craft the kinds of content as well as the kinds of on-going
42 research programs needed where real decisions occur. CCSP could establish Regional
43 Scientific Liaisons whose job would be to create and nurture links with state and regional
44 entities.

Comments on Chapter 13

1 CALIFORNIA RESOURCES AGENCY

2
3 Page 151, line 39. As mentioned in my overview comments above, it is important to
4 utilize existing climate change stakeholder networks and NGO's to facilitate outreach. In
5 addition to those described above, this includes ICLEI's Cities for Climate Protection,
6 EPA's state and local partners, national and regional NGO's and state and regional
7 greenhouse gas action plan participants (such as the New England Governor's and
8 Eastern Canadian Premiers Action Plan).

9 JANINE BLOOMFIELD, ENVIRONMENTAL DEFENSE

10
11 Page 152, Line 1: The section lacks any strategies to "*consult* with actual and potential
12 users" (emphasis added) as required by the Global Change Research Act. Rather, it
13 specifies information dissemination strategies, as though simply providing research
14 results to the media and the public suffices. (Even the "joint projects" have the goal "to
15 educate journalists.")

16 ELIZABETH L. MALONE, JOINT GLOBAL CHANGE RESEARCH 17 INSTITUTE, PACIFIC NORTHWEST NATIONAL LABORATORY

18
19 Page 152, Line 2: **Reporting and Outreach for the Public:** One item involves
20 organizing workshops to "educate" science journalists so they can provide more frequent
21 and informed coverage of science topics. Are journalists open to such "educational
22 workshops"? Or are they likely to view them as indoctrination and manipulation?
23 Perhaps there are ways to accomplish the goal of more informed coverage in the context
24 of providing reporters with ongoing, newsworthy information and access to in-depth
25 background if they want it.

26 ANDREA MCMAKIN, PACIFIC NORTHWEST NATIONAL 27 LABORATORY

28
29 Page 152, line 2ff: **(56-S)** No changes here, just a comment: This is quite well done, so
30 much so that it makes me want to get involved in the activity. In fact, I may just pursue
31 this.

32 HP HANSON, LANL

33
34 Page 152, lines 2-3ff: "The general public is the largest and the most important audience
35 for the communication of reliable global change information." This section is incomplete.
36 It does not mention that millions of federal dollars have gone to agenda-driven
37 environmental groups that systematically misrepresent and exaggerate the nature and
38 causes of climate change. The general public has been very poorly served by the federal
39 government in this respect, since tax dollars are being used to lobby for public policies
40 that would have little or no impact on the global climate but which would raise taxes and
41 reduce consumer choices. Examples include anti-car, anti-oil, anti-farming, and anti-
42 logging groups, many of which have used the public's fear of "global warming" to call for
43 policies already on their agendas for other, often ideological, reasons. I suggest the
44 USCCSP admit that efforts to subsidize outreach efforts managed outside the federal
45 government have often been politicized and distorted the true scientific message, and that
46 further funding should be withheld from all such groups. –

Comments on Chapter 13

1 **JOSEPH L. BAST, THE HEARTLAND INSTITUTE**

2
3 Page 152, Line 5: Mention of "consistent" information about global change research
4 could imply censorship of findings, e.g., to ensure consistency with an Administration
5 position - this would be incompatible with a credible research program. Or it could
6 mean, more benignly, that the term "significant" might have a specific statistical
7 meaning, or that metric units will be used in all cases, or that all online graphics will use
8 the JPEG format. The CCSP strategic plan should define what is meant by "consistent"
9 in this context.

10 **ROBERT M. CUSHMAN, OAK RIDGE NATIONAL LABORATORY**

11
12 Page 152, lines 9-13: CCSP and the federal agencies should not be the only sources of
13 such ideas. They will most certainly come from the scientific community, from the
14 international community, and arise in interactions with stakeholder groups. This sounds
15 much too closed an activity.

16 **MICHAEL MACCRACKEN, LLNL (RETIRED)**

17
18 Page 152, line 12. Who are the key constituents of the general public? Shouldn't all
19 groups be informed?

20 **JANINE BLOOMFIELD, ENVIRONMENTAL DEFENSE**

21
22 Page 152, line 20. In addition to briefings of research and press releases, much more
23 active outreach programs to the public should be sponsored. These should include TV
24 documentary series, partnerships with broadcast meteorologists, providing them with up
25 to date information for the public, and televised town meetings on climate change. These
26 should include existing scientific research findings from the National Assessment as well
27 as new research initiatives.

28 **JANINE BLOOMFIELD, ENVIRONMENTAL DEFENSE**

29
30 Page 152, Lines 20-38 This section lists how federal agencies could communicate more
31 effectively by working together.

32
33 SUGGESTION: This is an admirable section but it needs to be expanded greatly to
34 identify outreach objectives and methods. For instance, this section should also address
35 reaching out to news reporters, to persons in the entertainment industry, to religious
36 groups, and to other stakeholders. It also needs to note other communication vehicles
37 like on-camera interviews.

38 **PRICE, RSVP COMMUNICATIONS**

39
40 Page 153: The Pew Center strongly supports the outreach efforts for the public and for K-
41 12 education, as we feel that educating the public about climate change as well as
42 keeping them informed of government efforts on the issue is an important task.

43 **VICKI ARROYO AND BENJAMIN PRESTON, PEW CENTER ON** 44 **GLOBAL CLIMATE CHANGE**

45

Comments on Chapter 13

1 Page 153 ff: Chapter 13 is very important; see above comments about its linkages with
2 Chapter 4. Many of the issues mentioned here were tackled by the risk communication
3 research community more than a decade ago, so the risk communication literature will
4 provide useful insights. Evaluation, is crucial, and is credible only if based on theoretical
5 constructs about what should work and why. Note, however, that integrating science
6 information into decisions could result in decisions that are not what the climate change
7 science community would like to see: decision makers face multiple goals, constraints,
8 and decision factors that could lead them to different conclusions about the importance of
9 the implications from the climate science.

10
11 Chapter 13: For the education component in Chapter 13, earlier research has made it
12 clear that public school teachers already feel that they have much too much to cram into
13 the teaching time available to them. Thus it will be crucial to help them identify what can
14 be removed from the existing curriculum, or how the “new” material can be woven into
15 better examples of things they already must teach. Make it clear that we want them to do
16 “better” rather than “more.”

17 **ANN FISHER, PENN STATE UNIVERSITY**

18
19 Page 153, line 3ff: There is nothing here on Assessment responsibilities—that is
20 summarizing assessment information to help promote broader education.

21 **MICHAEL MACCRACKEN, LLNL (RETIRED)**

22
23 Page 153, Line 3: **Outreach for K-12 Education:** Is climate change education beyond
24 high school considered outside the scope of agency roles? If so, say why.

25
26 If it hasn't already been done, I suggest compiling an inventory of climate change-related
27 educational programs already in place, with evaluations (if they exist). That information
28 could be used to identify gaps appropriate for agencies to fill and to systematically target
29 curricula and approaches for various grade levels. In developing curricula and materials,
30 this point is extremely important: “Participate in dialogues with the [National Science](#)
31 [Teacher Association](#) (NSTA) and professional societies with K-12 programs to identify
32 basic curriculum content that needs to be provided to educators at all grade levels.”

33 Teachers are increasingly being held accountable for state-mandated standardized testing,
34 and it does no good to provide games, programs, activities, and web sites if they don't fit
35 into each state's science requirements.

36 **ANDREA MCMAKIN, PACIFIC NORTHWEST NATIONAL**
37 **LABORATORY**

38
39 Page 153, Lines 13-23 This section notes the importance of bolstering K-12 education
40 initiatives. Yes, we need to do this.

41
42 **SUGGESTION:** We need to especially ramp up education efforts from K-7, those years
43 that greatly influence basic learning. For instance, the nations of France and Japan
44 educate their children about nuclear energy. The result is a general public far more
45 knowledgeable about energy resources than the American public. Also, persons in these

Comments on Chapter 13

1 nations are much less susceptible to fantastic stories about nuclear issues that come from
2 the American entertainment industry.

3
4 Ensuring that our children learn the facts about climate science is paramount.

5 **PRICE, RSVP COMMUNICATIONS**

6
7 Page 153, Line 21 Under "outreach for K-12 education," replace the last sentence in the
8 second paragraph with "The GLOBE program (Global Learning and Observations to
9 Benefit the Environment), currently the largest K-12 earth science education program,
10 offers important lessons that future efforts can build on. Sponsored in part by NASA and
11 NSF, GLOBE combines field, classroom and internet based activities in an interactive
12 learning environment; and has trained over 20,000 teachers worldwide.

13 **ROGER C. BALES, UNIVERSITY OF ARIZONA**

14
15 Page 153, line 22. It is not enough to simply create a web site and trust that educators will
16 find it. There must be marketing to get people there. Suggest working with existing
17 educational networks and teacher resource internet sites to insure that the web site is
18 known broadly and is easily accessible.

19 **JANINE BLOOMFIELD, ENVIRONMENTAL DEFENSE**