

APPENDIX C: RESPONSES TO RECOMMENDATIONS RELATED TO CLIMATE INFORMATION PRODUCTS AND APPLICATIONS (CIPA) PROGRAM REVIEW

Climate Information Products and Applications Program Review
July 13-15 2009
Broomfield, CO

The July 2009 CWG-sponsored programmatic review of the CSD Program (called CIPA for purposes of the review) and the CWG's Spring 2010 meeting summary provide more than 50 recommendations and other constructive comments aimed at improving NOAA's climate services. CSD has formulated responses to approximately 45 recommendations. Given the length of this list, the substantive overlap among many comments, and the need to work across the Climate Goal (CG) to address others (see green and gray cells in the appendix), CSD proposes to formulate written responses to the CWG focused around these primary topics:

(1) Recommendation: Develop Strategic Framework / Strategic Plan for Climate Services

- a. Develop a strategic plan and framework for climate information products, applications, and related services. (Includes additional areas for consideration recommended by the panel under three categories: [1] NOAA's central strategy; [2] NOAA's collaborations with others; and [3] Other attributes.)**
- b. Given the high-quality of existing CSD programs, develop a strategic plan to thoughtfully scale-up these efforts in a coordinated way to meet future climate service needs**

Response:

Recommendations to develop program- and goal-wide strategic plans with sufficient specificity on how NOAA will scale-up climate services and integrate work both across the NCS' elements and with other parts of NOAA (i.e., other goal teams), has proceeded. CSD will respond from the program's perspective. A Strategic Vision and Framework for a Climate Service in NOAA has been released for public review. That document identifies ISDDS as one of three core capabilities, all of which will focus initially on five societal challenges. These challenges require concerted effort by the ISDDS working with internal NOAA and external partners. Already, new Regional Climate Services Directors have been selected and have begun the tasks of coordinated and mutually supportive functions. An important effort for the RCSD will be to develop Regional Action Plans that lay out clearly efforts in State, local, and tribal engagement, regional climate science, assessment services, and integrated climate products and services for decision support.

(2) Recommendation: Develop Meaningful Methods to Evaluate Progress and Measure Performance

- a. Developing and analyzing performance measures requires special training and skills; it is a discipline in its own right. NOAA should get input on its work in this arena from individuals with appropriate experience; effort will require**

cooperation among evaluation specialists, external subject matter specialists, and users.

- i. **Response:** The basis of evaluating progress and measuring performance is the Government Performance and Results Act (GPRA), used to measure not the process of doing work, but the actual accomplishments or "outcomes". It will take a variety of skills and social science techniques to measure outcomes. The CSD goal is to measure the depth and breadth of use of climate information and services to improve decision-making in the face of a changing climate.

- b. **Performance measures should be realistic in terms of program objectives and the growing government demands for accountability. Having a single metric is inadequate. Because of the varying purposes for which metrics are needed, there should be a suite of performance metrics for NOAA's climate services.**
 - i. **Response:** The GPRA performance measures are in the process of being revised. There will be "nested" performance measure for each of the programs in NCS.

- c. **For the metrics to be most useful, NOAA should collect benchmark data now. These benchmark data, because they are obtained prior to implementation of the program, will provide a means of assessing changes in the metrics (and the underlying progress) over time.**
 - i. **Response:** As part of the National Assessment, user benchmark data will be collected. Also, the RCSD will incorporate information available presently from the cadre of climate service providers within their regions.

- d. **The NOAA discussion of metrics focused mostly on process and programmatic performance, but the specific products of NOAA's climate services also need to be assessed, quite apart from the programs that produce these climate products.**
 - i. **Response:** Products and services need also to include technical assistance, training, and guidance documents to enable planning and decision making.

- e. **Programs should be assessed in terms of their goals and aspirations as well as their concrete accomplishments. Monitoring programs solely in terms of specific accomplishments could be too limited if the assessment fails to take into account whether the aspirations of the program are as broad and inclusive as they should be.**
 - i. **Response:** The GPRA nested within CSD will attempt to measure, for example, the products and services used for planning and decision-making in various socio-economic sectors (e.g. water, coastal, ocean, forest, wildlife management).

Response: CIPA Review included numerous recommendations concerning performance measurement, which is an item for consideration and response by all of Climate Goal and the NCS. Outcome-based performance measures are already under development. These in turn will necessitate using some social science methods for measuring the effectiveness of the activities undertaken by the ISDDS.

(3) Recommendation: Improve Understanding of Existing NOAA Capabilities and Assets

a. Develop and maintain a database of climate service activities across all NOAA programs

- i. **Response:** Climate Services databases are kept by the individual operating units that are presently spread across Line Offices. CSD would expect the Regional Climate Service Directors to maintain a database of the climate service activities within their region, combining input from all the enterprise partnerships.

b. Under the leadership of the NOAA Education Council and Communications Committee, complete a comprehensive inventory of climate-related educational and outreach products, programs, and partnerships; identify entities within NOAA that have the lead role. An appropriate home for this inventory is the NOAA Climate Portal.

- i. **Response:** An inventory of products and programs will be an output of the Climate Information Stakeholder Needs Assessment.

c. Assess the strengths and weaknesses of NOAA's existing climate programs with respect to partnering with other federal, state and local agencies, NGOs, academia, and commercial enterprises

- i. **Response:** CSD will first identify the existing partnerships with its primary partners, other federal agencies, states, NGSs and sectoral groups. Many of these relationships were developed *ad-hoc*, thus accessing the strengths and weakness and developing a clear strategy on solidifying Action Plans will be in order. NOAA has redoubled its efforts to engage with other federal agencies through the USGCRP. Engagement at the state and local scales, as well as engaging with NGSs, and academic and private partners, is to be established and developed through the Regional Climate Service enterprise.

Response: Recommendations here echo a long-standing issue: the need for NOAA to have a better inventory and understanding of its activities and assets, including external partnerships. The CIPA Review Panel, in particular, called for this inventory to extend beyond those activities funded/conducted through CG. A "Needs Assessment" will be part of the Climate Assessment Program. ISDDS will conduct, first of all, a thorough inventory of the existing assessments, within each Region. With this basis, the placed-based efforts can be better constructed to respond to the needs of the region based on the climate capabilities and assets already in existence.

(4) Partner/Customer Engagement, with two primary subthemes:

(A) Improve Understanding of Customer Needs/Capabilities and Build Their Capacity

- 1) **Become a far better listener, information-gatherer, and facilitator than it has been to date. Outreach and engagement of other information providers, users, and stakeholders need to be far more effective and strategic. In particular, NOAA needs to engage a broader range of intermediaries. NOAA leadership should recognize that**

this work will necessarily be ongoing, extensive, and costly, and budget, staff, structure, and plan accordingly.

- a) **Response:** Through NOAA staff and primary partners, NOAA has access to a cadre of professionals at the national, regional, and local level that can be effective in stakeholder engagement. To effectively engage with its many constituencies, CSD must move beyond unilateral outreach and work with these constituencies to define problems jointly, and determine solution sets. CSD recognizes that engaging with a broader range of intermediaries will require sustained effort.
- 2) The value of NOAA's extensive programs, projects, people, and partnerships could be enhanced significantly through better coordination and collaboration within NOAA and with external partners in developing and delivering products and services (including education and training) to the public on climate change, including mitigation and adaptation. To do this, NOAA must get closer to its customers (existing and prospective) to determine their needs and wants.**
 - a) **Response:** CSD intends to develop the skills in engagement personnel, scientist, policy analysts, outreach professionals, and educators to regularly engage with stakeholders to invest time in understanding needs so that climate information can be applied in a way that provides the greatest benefit. Use of a "communities of practice" philosophy will build a community approach within regions.
- 3) Conduct a national climate services needs assessment to guide [CSD] strategic planning**
 - a) **Response:** Establishing and supporting the regional dimensions of a sustained National Assessment is another specific focus of the CSD. Three types of assessments will be pursued: National and International Climate Science, Thematic Problem-focused, and Climate Information Stakeholder Needs Assessments. The latter will help identify what problems to focus on, including content analysis and user needs analysis.
- 4) Better connect and communicate with the intermediaries and end users of climate products and services to accurately assess their needs and to explore avenues of collaboration. The communication may be accomplished in part by an advisory council drawn from diverse sectors**
 - a) **Response:** Regional specialists will need to be employed whose primary responsibility is to engage stakeholders in the development, delivery, and application of climate services by working with and through staff at the local and state levels.
- 5) Develop communication mechanisms to ensure that regional and place-based needs assessments are guiding national level research and development agendas**
 - a) **Response:** CSD will include climate service users and private sector partners in the development of the assessments in order to ensure assessments are well grounded in sustained engagement across geographical regions and societal sectors. The NCS' assessments will contribute to the broader national and international assessments being implemented by the USGCRP and by the WMO and IPCC.

- 6) **Assess existing climate products and services outside the agency, with the goal of effectively leverage existing and complementary resources, products and services through long-term partnerships**
 - a) **Response:** Expanding sectoral engagement and customer support in close collaboration with DOC Bureau partners as well as other NOAA partners outside NCS. Related to this will be the establishment of meaningful business practices with the private sector. This has implications for National Assessment as well.
- 7) **Develop a taxonomy of users, based on such categories as climate information space and time scales, authority, management responsibility, level of government, decision-making responsibility**
 - a) **Response:** Regional Action Plans are to include a taxonomy of users.
- 8) **Increase support of state climate programs to anchor state-level NOAA climate services efforts**
 - a) **Response:** One specific initiative for CSD is re-establishing a sustained partnership with states thru State Climatologists including support for high-priority needs they identify in discussion with RCSDs.
- 9) **With information on customer needs and existing NOAA assets/resources, determine NOAA's role in various potential partnerships within the climate service enterprise, developing well-conceived goals, plans and policies for collaboration with its diverse partners**
 - a) **Response:** CSD will provide regional focal points for development, delivery and evaluation of climate products and services especially for decision support through internal and external partnerships.
- 10) **The CWG lauds NOAA for the recognition that national climate services must be a vital and vigorous public-private partnership, but was disappointed at the lack of specificity. NOAA and NCS will have to make significant investments in academia and the private sector to ensure that the necessary capabilities are created and focused on delivery of climate services.**
 - a) **Response:** CSD takes, as a primary function to provide resources to the academic community and others via competitive grants and cooperative agreements, including cooperative institutes, especially for analysis, modeling, and application and development of integrated services. The use of Cooperative Research and Development Agreements will incentivize the speed of commercialization of federally-developed technology. Engagement through the AMS' Weather and Climate Enterprise, will ensure active engagement with private sector providers and users in the development of climate services.

Response: An array of recommendations pointed to the need for NOAA to be externally focused, and be far more systematic in its work to better understand its customers and their needs and to prioritize its services. With this in mind, the ISDDS has laid out an enterprise composed of core partners, boundary organizations and intermediary groups. Several familiar to the CWG include RCCs, RISAs, Sea Grant, State Climate Offices, but extent further to groups such as the The Climate Adaptation Knowledge Exchange (CAKE),

and the National Science Teachers Association (NSTA), to name two. Leveraging existing networks and resources of partners is key to the organization of ISDDS.

11) There is little sense of how the [Regional Services] philosophy translates to implementation and practice, relationships with partner agencies, or priorities, or any criteria for establishing priorities of regional climate services...An Interim or Transition Plan for climate services...Seems essential for ensuring rapid spin-up of the NCS with sufficient depth and breadth that actual performance is aligned with user expectations based on prior engagement, and as a hedging strategy in case the NCS approval schedule continues to lag...It would be helpful, for either the NCS as envisioned or an Interim/Transition Plan, to use a very specific case to “build out” climate services, with a realistic time schedule, to demonstrate that NOAA understands what it means to integrate science and regional services in practice.

Response: The NCS will foster the development of an innovative, integrated Regional Climate Services Partnership that brings together internal NOAA and extramural partner regional services activities and provides the institutional foundation for the NCS regional program. The NOAA Regional Climate Services Partnership comprises four coordinated and mutually-supportive functional elements: state, local, and tribal engagement; regional climate science; assessment services; and integrated climate products and services for decision support. Six new regional climate service directors were recently hired to begin coordination and integration of partners within each region. One of their short-term deliverables is the development of an action plan fostering the expansion of current and future regional partnerships.

(B) Improve Communication/Coordination (NOAA-Partner and Partner-Partner)

1) NOAA and NCS will have to build working relationships with critical partners – within NOAA itself, and with other federal agencies, state agencies, and sector-based industry associations – to design those services and effectively delivery them to targeted audiences.

a. **Response:** CSD recognizes that cooperation, not competition, between public and private sectors is the best way to meet the diverse needs of a society as a whole. Therefore CSD is committed to growth of public-private partnerships and capabilities to promote the Enterprise. Collaborations with internal NOAA teams are underway through the Climate Portal; with other Federal agencies through USGCRP Task Force for Interagency Climate Change Communications, Education, and Engagement; and sector based agencies through the RCSDs, including efforts to strengthen collaborations with States.

2) It is important that a cross-agency effort, possibly led by NOAA, is needed so that best practices can be shared and leveraged. It is important to note that each Agency has a unique focus related to climate science so the suggestion advocates a leveraged not a “one size fits all” effort.

- a. **Response:** Existing resources will be leveraged to ensure efficiency while enhancing responsiveness regionally. Noteworthy, the Climate.gov Portal is an inherently leveraged program and product and service output/outcome mechanism.
- 3) **Embrace new channels of communication along with more traditional channels to reach the public. Establish a culture of outreach, education, and engagement that is two-way and symmetrical (rather than one-way and asymmetrical, as employed by federal agencies for decades).**
 - a. **Response:** CSD will utilize methods based on current social science techniques, such as stakeholder analysis, surveys, interviews, and workshops, to further develop two-way communication. CSD will continue the development of the Climate Portal. Some new channels of communication initiated under the pre-NCS model include a series of “Community Conversations on Climate and [...]” series of public dialogs
- 4) **The Engagement group faces challenges in shifting from a media group to a key role in bidirectional dialogue and discovery with users that informs climate services. With limited resources and rapidly evolving demands, the need for prioritizing engagement is clear...A high priority should be engagement with the stakeholders and agencies that have driven development of climate services and have immediate needs for those services, i.e., the influencers of science policy, NOAA advocates, and scientists and data users.**
 - a. **Response:** Engaging with the stakeholders and agencies who have driven development of climate services has CSD's prime attention . Three functional entities will assist that effort: The Environmental Information Services Working to evaluate climate-related engagement with the private sector; the Quality of Relationship method to evaluation communication of climate information with users; and the Kellogg evaluation rubric to assess effectiveness of user interaction.
- 5) **Foster and enhance partnerships within NOAA's existing climate programs (as well as with external entities), guided by overarching goals and policies. For example, RISAs and RCCs seem to be natural collaborators, such that results from research projects at RISAs can be transitioned to operations at RCCs.**
 - a. **Response:** Moving out on the regional enterprise including: implementing an integrated program management for regional partnerships and programs (RISA, TRACS, SARP, RCCs, relationship with AASC, and establishing service level agreements with NWS/CSD, NWS/CPC, NOS/CSC, Sea Grant, and others.
- 6) **Better utilize the expertise and resources of intermediaries, such as RISAs, RCCs, state climate offices, academic and private sector specialists, to expand its reach and improve its services to end users in broadly diverse regions and sectors**
 - a. **Response:** The Enterprise includes development of regional services action plans that clearly delineate regional information needs, assets, gaps and partnerships (across NOAA and with other agencies). These action

plans will clarify specific foci for regional service expansion with intermediaries in the future funding years.

- 7) **Develop and support relationships with ‘boundary organizations’ that have strong existing connections to stakeholders**
 - a. **Response:** CSD will expand the number and expertise of trusted trans-boundary experts who understand and can connect both the emerging science with the NCS and the requirements of users. Some intermediary organizations include the Association of Science-Technology Centers (ASTC) Communicating Climate Change (C3) Network; the Climate Literacy Network, the National Science Teachers Association (NSTA) Webinar series for professional development of educators; and the Climate Adaptation Knowledge Exchange (CAKE).
- 8) **Support coordination and communication between regional/place-based climate service programs**
 - a. **Response:** Place-based experts will support evaluations of local, state, and tribal adaptation programs and policies.
- 9) **Develop joint inter-agency funding mechanism (e.g., a grant program) to encourage inter-agency and stakeholder partnerships in interdisciplinary, applied climate science research, education, and capacity building**
 - a. **Response:** CSD intends to review and develop priorities for the competitive grants program particularly for the 5 societal challenges and 3 critical core capabilities identified in the NCS Strategic Vision and Framework document.
- 10) **Improve partnerships and collaboration with Tribal Nations, trusts, and territories**
 - a. **Response:** CSD Regional Climate Services Enterprise is to include the collaboration with Tribal Nations, trusts, and territories. Activities will focus on enhanced communications related to changing climate and impacts; climate education and literacy; and place-based expertise to support development and evaluation of adaptation programs and policies.

Response: There were also numerous recommendations on how to foster and sustain more robust, meaningful partnerships with and among NOAA’s partners and stakeholders, and ways to improve flow of information and coordinate activities across the climate enterprise. Besides the installation of Regional Climate Service Directors, ISDDS is also coordinating through the USGCRP Task Force for Interagency Climate Change Communications, Education, and Engagement. Climate.gov virtual teams have begun building collaborative means to communicate on climate science and services. As the NCS Vision document states, ISDDS will work with a variety of partners in and outside of NOAA, building mechanisms for sustained user dialogue, and collaborating with place-based experts to build on existing programs designed to improve that flow of information.

(5) Improve Other Aspects of NOAA's Climate Products/Services

- 1) **Habitat recovery and restoration initiatives must come to include plausible future states of ecosystems, reflecting potential impacts of climate change, as a core part of their planning frameworks. It should be a priority for climate services to feed into these frameworks.**

- a. **Response:** Habitat recovery and restoration initiatives are one important example of the need for place-based focused efforts through the Regional Climate Service Enterprise.
- 2) **Given the recent findings of The Ocean Project and Jon Krosnick, et al. that climate change is on the list of public priorities and the ocean is not, and that the public failed to make connections between climate change and the ocean, climate change might be a good horse to ride to get the public engaged in the ocean's role in climate change and how climate change is affecting the ocean.**
 - a. **Response:** development of partnerships through active participation in appropriate groups would include engagement activities through: Interagency Working Group on Ocean Acidification, Interagency Working Group on Ocean and Coastal Mapping, Ocean Research and Resources Advisory Panel, Interagency Climate Change Adaptation Task Force Workgroup on Coasts and Oceans, Regional Ocean Governance groups such as the West Coast Governors' Agreement on Ocean Health and Coastal States Organization (CSO) Climate Change Work Group
- 3) **Using the existing structure, establish and fund appropriately a core education and outreach team within NOAA with the experience, expertise, and capacity to engage with NOAA's diverse extension networks and external partners. Promote and expand existing programs sponsored by AMS, AAAS, NSTA, NEEF, ASTC, Sea Grant, CSC and others to bridge the chasm between fundamental research and outreach to diverse audiences. Enhance the social science capacity within NOAA and in its partners.**
 - a. **Response:** An Education and Communication function will form part of the CSD. That function coordinates with the USGCRP Education Interagency Committee. NCS will use effective partnerships as the foundation to develop business practices to foster communication, collaboration, and engagement with organizations that are external to NOAA. CSD will build on existing programs designed to improve access to useful and usable NOAA climate data products and services, enhance overall climate literacy among the nation's citizens, provide technical training on NCS products and services
- 4) **Take the lead in developing and delivering with its partner networks a portfolio of coherent programs using a uniform set of messages tailored to different audiences.**
 - a. **Response:** CSD will take the lead, with other partners, in developing business practices in climate outreach and communication. One example of such a business practice, which will be codified in formal agreement, is the 2010 memoranda of understanding between the U.S. Department of the Interior and the DOC to coordinate and cooperate in climate-related activities involving science, services, mitigation, adaptation, education, and communication. Work involves helping to forge Communities of Best Practice for developing messages and building relationships with stakeholders and key target audiences.

5) NOAA is very proud of its designation as the lead agency on climate. However, it is the view of the CWG that it must be more proactive and responsive on contemporary issues and misinformation that is being propagated in the media, blogosphere, and other forums.

- a. **Response:** Due to gaps in science education and literacy, and the current disinformation campaigns, providing easy access to understandable, useful and usable information about the nature and consequences of changing climate becomes even more important. Further development of web-based tools such as the climate services portal (climate.gov), training on outreach and communication, and collaboration with other forums such as Climate Central will continue. One of the Climate.gov virtual teams — Understanding Climate — is newly dedicated to (a) developing an overarching climate narrative that moves public discourse beyond debate and into a solutions-oriented frames; (b) being nimbly responsive in providing communications products and visualizations that address recent natural events, hearings on the Hill, and new science results.

Response: Both the CIPA Review Panel and CWG identified other specific changes to NOAA's services – principally concerning timeliness, scope, scale, and subject-matter content. An overarching means of service development is the push pull model. The needs of the customers, within their decision-making environment, will drive the development of climate services. Thus, customer needs assessment and in services prioritization will be important. In some cases, it will likely be several years before the related CIPA or CWG recommendations could be considered fully addressed. But, through the processes of stakeholder involvement in the development of NCS, five societal challenges have already been identified as the foci of attention for climate product and services development.

6) Embrace as an urgent priority the task of developing its current array of climate information products and applications into a much more robust set of NOAA climate services, able to meet our nation's current and future needs

Response: NOAA Climate Service seeks to combine the agency's world-class existing service development, delivery, and communication capabilities, to create a service-oriented organization that advances scientific understanding, engages users collaboratively and delivers service. A first step will be to integrate existing capabilities and experience with climate-relevant science and services.

7) The CWG and the SAB, as they revisit NOAA programs in COM, CRM, and [CSD], should recognize the transitional nature of [CSD] and conduct, perhaps within a year, a true NOAA climate services review. This should comprehend the whole of NOAA's climate service activities across the agency (explicitly including, for example, CPC, and NCDC), not just those aspects considered in the CIPA 2009 review. It should also focus not just on

process but also on substance (explicitly addressing, for example, aspects such as the incorporation of probabilistic information and uncertainty into products and services).

Response: The National Academy of Public Administration (NAPA) recently conducted a study and analysis of organizational options for a National Climate Service within NOAA, emphasizing maximum effectiveness and efficiency. NOAA requested that the review panel provide an independent assessment of how NOAA should organize its climate capabilities; assess NOAA's proposed organizational structure; and make recommendations for a climate Service line office structure that will integrate NOAA's climate science and research with service delivery. In addition, NOAA's Science Advisory Board (SAB) will be reviewing the composition of all working groups during their December 2010 meeting. As NOAA builds the structure to support and moves forward with the implementation of a NOAA Climate Service, we are exploring how to best utilize the SAB and the full array of working groups as we move forward.

8) The absence of a comprehensive plan for dealing with the ecosystem dimension of climate change and climate adaptation is not surprising; however, the Climate Goal needs a very clear idea of how it is going to proceed to provide the best and most appropriate products and services where they will do the most good and serve the broadest range of clients possible.

9) There needs to be close and effective linkages between the Climate Goal and the Ecosystem Goal. Neither can succeed in this large area of overlap unless both do more than just communicate but actually integrate their work. Information must be timely....a climate service must then actively take the lead to develop its own content, rather than passively waiting for material to be published by the research community.

Response: We recognize that the ecosystem dimension of climate change and climate adaptation is particularly necessary to a climate service. The NOAA Climate Service will focus on five societal challenges with broad economic range including the sustainability of marine ecosystems. Ecosystems are a priority to NOAA's mission and it is NOAA's priority to identify a comprehensive approach to address this societal challenge. In the new NOAA Climate Service structure, we will work across NOAA to address specific problems and will support development of new climate services necessary to meet these societal challenges.

10) Recommendation: An important role of a climate service is to serve as the authoritative voice on the status of climate science questions, a function now performed on an ad hoc basis to a very limited extent by some RISAs

Response: NOAA's Climate Service will build on existing programs designed to improve access to useful and usable NOAA climate data products and services, enhance overall climate literacy among the nation's citizens, provide technical training on NCS products and services, and expand the cadre of individuals skilled in understanding the societal

consequences of changing climate conditions and the scientific and technical capabilities that they have at their disposal.