Gulf of Maine Research Institute

22 October 2024

Dear Secretary Haaland,

On behalf of the Department of the Interior's (DOI) Advisory Council for Climate Adaptation Science (the Council)—and in my capacity as its Chair—it is my pleasure to relay the attached set of initial recommendations. As we present this initial set of recommendations, we wish to acknowledge the valuable work of the Advisory Committee on Climate Change and Natural Resource Science, and their March 2015 report that provided great inspiration to the Council.

During the Council's first meeting at DOI headquarters in February 2024—where we had the distinct honor of meeting with you—we learned of three priorities from the USGS Climate Adaptation Science Center network that informed the Council's deliberations:

- National Climate Adaptation Science Priorities,
- Science Delivery and Communication, and
- Partnerships and Community-Building

We pursued our work through subcommittees covering each of these priorities. Our deliberations culminated in the set of eight initial recommendations that were reached by full consensus from a diverse group of experts—knowledge holders, generators, and users—representing Indigenous, academic, state government, private sector / industry, and nonprofit organization perspectives.

The Council is eager to continue to fulfill its charge, both at its upcoming meeting on November 13-14, 2024, in Minneapolis and in the future. As such, we anticipate providing additional recommendations in the year ahead. Should it be of use, the Council is prepared to meet with you to discuss the following recommendations, our process for arriving at them, and our plans for the future.

We share a deep commitment to providing the best available science for supporting decision-makers in helping fish, wildlife, habitats, and society adapt to a changing climate. And we are grateful for and humbled by the trust you have placed in us to provide these recommendations.

Sincerely,

David Reidmiller, Ph.D.
Director, Climate Center at the Gulf of Maine Research Institute
Chair, Department of the Interior Advisory Council for Climate Adaptation Science
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Report to the Secretary of the Interior

Initial Recommendations from the Advisory Council for Climate Adaptation Science (ACCAS)

Artist: Codie Winn, South Central CASC

October 2024

Dedication

This report is dedicated to the memory of Mervyn ("Merv") Tano, a valued and respected member of the Advisory Council for Climate Adaptation Science who passed away on September 18, 2024.

Merv served as a representative of Tribes and Indigenous Organizations on the Council and was the President of the International Institute for Indigenous Resource Management (IIRM), an organization working on law and policy research projects aimed at enhancing indigenous peoples' control over and management of their lands and resources, including the implementation of climate adaptation solutions.

Merv played a crucial role in developing the Council's initial recommendations included in this package, particularly in the areas of partnerships and community building, and science delivery.

Merv was passionate and dedicated to "moving the needle" on climate adaptation. His contributions will be profoundly missed.

Report to the Secretary of the Interior

Initial Recommendations from the Advisory Council for Climate Adaptation Science

OCTOBER 2024

Executive Summary

BACKGROUND

The Advisory Council for Climate Adaptation Science (ACCAS or Council; officially established in September 2023) advises the Secretary of the Interior on the operations of the U.S. Geological Survey's (USGS) National Climate Adaptation Science Center (NCASC) and its nine regional Climate Adaptation Science Centers (CASCs). The duties of the Council include advising on:

- the contents of a national strategy identifying key climate adaptation science priorities to advance the management of natural and cultural resources in the face of climate change;
- the nature, extent, and quality of relations with and engagement of key partners at the regional/CASC level;
- the nature and effectiveness of mechanisms to effectively deliver science information and tools, and build capacity, to aid the natural and cultural resource management community and decision-makers in adapting to a changing climate;
- mechanisms that may be employed by the NCASC to ensure high standards of scientific quality and integrity in its products; and
- the integration of equity, particularly for historically underserved communities, in the operation of the NCASC and regional CASCs.

The ACCAS was convened in the fall of 2023 and consists of 20 appointed members (18 active members) representing a variety of expertise and interests[1]. Appendix 1 contains the membership roster as of September 2024.

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[1] Note: Caleb Hickman (Cherokee Nation) was formally appointed to the Council in August 2024. Mervyn (Merv) Tano, representing the International Institute for Indigenous Resource Management, passed away on September 18, 2024.

PROCESS OVERVIEW

The ACCAS met in February[2] and August[3] 2024. Consistent with its scope and assigned duties, the Council decided at its February meeting to form three subcommittees relevant to the USGS CASC priorities to develop recommendations focused on: (1) national science priorities, (2) science delivery and communication, and (3) partnerships and community building. Between March and July 2024, each subcommittee met five times, prioritized the issues to focus on for these initial recommendations, and worked both independently and collaboratively between meetings on assigned tasks.

While Council members are not required to participate in subcommittees, all active Council members served on one or more subcommittees. Each subcommittee comprised four to six Council members, with one or two committee leads. USGS CASC staff participated in the subcommittee meetings to share information about the current USGS operations and inform the subcommittee's discussions.

Each subcommittee developed draft recommendations that were refined through collaborative discussion, and adopted with full consensus by Council members at its second meeting on August 23, 2024. These recommendations are the basis of this report.

RECOMMENDATIONS AND KEY THEMES

The ACCAS reached consensus on eight initial recommendations under the aforementioned three CASC priorities for the Secretary's consideration. These recommendations include some interdependencies and bridge several areas.

Key themes across recommendations:

- The Council recognizes that there are **multiple strategies to advance the USGS science delivery** to the climate adaptation community, including through partnerships, training, capacity-building, publications, and communications. As such, these recommendations should be considered illustrative and not exhaustive.
- The Council recognizes the **importance of training and capacity-building** as part of USGS's science and data-related activities, and emphasizes that training should be endorsed, supported, and expanded at appropriate levels institutionally.
- The Council concurs that **enhancing partnerships and community building with Tribes**, consistent with government-to-government principles, is important. The Council also affirms that Indigenous knowledge provides an invaluable complement to Western knowledge and should be woven into the national science priorities.

[2] The materials and summary from the ACCAS Meeting 1 (February 27-28, 2024) are available on the USGS website.

[3] The materials and summary from the ACCAS Meeting 2 (August 23, 2024) are available on the USGS website.

Summary of ACCAS Initial Recommendations

National Science Priorities	
1. Emergent and Transformative Risks	• Emerging climate risks • Ecological transformation • Thresholds & tipping points / Irreversibility
2. Science & Risk Communication	• Training in climate literacy and management decision-making under uncertainty • Translating current research and knowledge into public awareness and community engagement • Advancing synthesis and accessibility of existing information while expanding monitoring networks • Transferability of adaptation actions
3. Implementing & Evaluating Adaptation Actions	• Evaluating efficacy of pilot adaptation actions • Adaptation implementation science
4. Innovative Approaches to Advancing Ecosystem Science	• Emphasize interdisciplinarity • Utilize the ability and capacity to generate and integrate Big Data[4] in dynamic environments
Partnerships and Community Building	
1. Enhance partnerships and community building with Tribes consistent with government-to-government principles	• Ensure CASCs have the ability to enter into contracts, grants, cooperative agreements, and interagency agreements with Tribes, in accordance with the CASCs' mission • Continue to enter into agreements with Tribes through host or consortium institutions. This approach is particularly important for Tribes that may have limited capacity. • Continue to support CASCs' ability to partner and directly enter into agreements with Tribes in ways that recognize the government-to-government relationship including new mechanisms outlined in the FY24 Congressional appropriation and other policies that may be available within the Department of the Interior (DOI).

[4] Large and diverse datasets too large for traditional computational tools available to most agencies, organizations, and Tribes. Historically, USGS has left it to others to organize and manage the warehousing of these data.

2. Expand on existing mechanisms for the CASCs to allocate resources for training and capacity building	• Recognize, empower, and amplify opportunities to leverage existing regional activities (e.g., annual meetings) as a space for training and informal education and the formation of partnerships with professional associations[5]. • Deepen connections to interagency training resources in order to benefit CASC researchers and partners, leading to improved adaptation outcomes. • Expand development of synthesis science[6] creating a pathway for more co-production and training opportunities. • Support opportunities that provide the CASCs with the appropriate authority to address training and capacity building with partners.
Science Delivery	
1. Climate Adaptation Technical Services (CATS)-Specific Information Technology Infrastructure and Processes	The ACCAS recommends the use of beneficial information technology systems and tools that would enable development of a structure and culture within the CATS program to deliver timely, effective, and rigorous science products using existing peer-reviewed science. Use of such beneficial systems and tools would: • Enable timely delivery of science products, while allowing for the iterative improvements of products; • Structure team dynamics and delivery of defined, milestone-based tasks that contribute to the final product delivery within the requested timeframe; • Enable flexibility to allow for changes to technology, systems, and processes to reduce down-time.
2. CATS-Specific Publication and Peer Review Process	• Incentivize quick turnarounds • Streamline peer-review processes • Utilize technology and collaborative platforms • Utilize external collaborations

[5] A professional association is an organization that aims to advance a certain industry and/or academic discipline, develop the growth of professionals in the field, and provide a service to help their common community. Professional associations in the United States range from organizations that set standards for both members and practice, such as the American Society of Civil Engineers (ASCE) and American Bar Association to organizations that provide opportunities for collaboration, sharing of best practices, and mentorship to emerging professionals, such as Institute for Tribal Environmental Professionals (ITEP) and American Society of Adaptation Professionals (ASAP).

[6] Synthesis science or research is the integration of existing knowledge to gain new insight. Typically, it is a process in which multiple existing data sets or sources are integrated with each other to address a new question or challenge. Synthesis is often conducted collaboratively across scientific and professional disciplines, combining academic and non-academic data and knowledge. The aim is to generate new knowledge by leveraging data from multiple sources, understand complexity across scales, identify patterns in linked natural or human-natural (socioecological) linked systems, and deliver findings that are applicable for decision-making, management, and policy.

Initial Recommendations from the Advisory Council for Climate Adaptation Science

BACKGROUND

The Advisory Council for Climate Adaptation Science (ACCAS; officially established in September 2023) advises the Secretary of the Interior on the operations of U.S. Geological Survey's (USGS) National Climate Adaptation Science Center (NCASC) and its nine regional Climate Adaptation Science Centers (CASCs). The duties of the Council include advising on:

- the contents of a national strategy identifying key climate adaptation science priorities to advance the management of natural and cultural resources in the face of climate change;
- the nature, extent, and quality of relations with and engagement of key partners at the regional/CASC level;
- the nature and effectiveness of mechanisms to effectively deliver science information and tools, and build capacity, to aid the natural and cultural resource management community and decision-makers in adapting to a changing climate;
- mechanisms that may be employed by the NCASC to ensure high standards of scientific quality and integrity in its products; and
- the integration of equity, particularly for historically underserved communities, in the operation of the NCASC and regional CASCs.

The ACCAS consists of 20 appointed members (18 active members[7]) representing a variety of expertise and interests. Appendix 1 contains the membership roster as of September 2024.

PROCESS OVERVIEW

To date, ACCAS met two times in February[8] and August[9] 2024. Consistent with its scope and assigned duties, the Council decided to form three subcommittees relevant to the USGS CASC priorities to develop recommendations focused on: (1) national science priorities, (2) science delivery and communication, and (3) partnerships and community building. Between March and July 2024, each subcommittee met five times, and worked both independently and collaboratively between meetings on assigned tasks.

[7] Note: Caleb Hickman (Cherokee Nation) was formally appointed to the Council in August 2024. Mervyn (Merv) Tano, representing the International Institute for Indigenous Resource Management, passed away on September 18, 2024.

[8] The materials and summary from the ACCAS Meeting 1 (February 27-28, 2024) are available on the USGS website.

[9] The materials and summary from the ACCAS Meeting 2 (August 23, 2024) are available on the USGS website.

Full Report

While Council members are not required to participate in subcommittees, all Council members (with the exception of one member recently appointed, and one inactive member) served on one or more subcommittees. Each subcommittee comprised four to six active members, with one or two committee leads. USGS CASC staff participated in the subcommittee meetings to share information about the current USGS operations and inform the subcommittee's discussions.

Each subcommittee developed draft recommendations that were refined and, ultimately, approved through a consensus-based process by the full Council at its second meeting on August 23, 2024.

RECOMMENDATIONS AND KEY THEMES

The ACCAS has prepared eight initial recommendations under the aforementioned three CASC priorities for the Secretary's consideration. These recommendations include some interdependencies and cut across multiple areas.

Key themes across recommendations:

- The Council recognizes that there are **multiple strategies to advance the USGS science delivery** to the climate adaptation community, including through partnerships, training, capacity-building, and communications. As such, these recommendations should be considered illustrative and not exhaustive.
- The Council recognizes the **importance of training and capacity-building** as part of USGS's science and data-related activities, and emphasizes that training should be endorsed, supported, and expanded at appropriate levels institutionally.
- The Council concurs that **enhancing partnerships and community building with Tribes** consistent with government-to-government principles is important. The Council also outlines that Indigenous knowledge provides an invaluable complement to Western knowledge and should be woven into the national science priorities.

Recommendations for National Science Priorities

INTRODUCTION

Among the objectives charged to this Council through its Charter was "Advising on the contents of a national strategy identifying key climate adaptation science priorities to advance the management of natural and cultural resources in the face of climate change." In endeavoring to fulfill this objective, the Council reflected on the value of existing CASC priorities developed regionally and/or with particular partners and wishes to re-affirm the importance of these context-specific priorities (e.g., those related to specific sets of species, such as endangered species, game species, or culturally important species; range shifts; conservation introductions; landscape connectivity). What follows is an enumeration of an illustrative—not exhaustive—set of climate adaptation science priorities applicable at the national scale. We believe these priorities set a framework, within which more specific regional and national priorities and/or discrete activities, funding opportunities, etc. can be developed.

The Council strongly concurred that Indigenous Knowledge provides an invaluable complement to Western knowledge and, as such, should be valued as a priority, woven into context-specific climate adaptation research, where appropriate and in consultation with said knowledge holders, and not be a stand-alone national science priority. Indigenous communities have cultivated their traditional knowledge to develop, implement, and refine adaptive nature-based strategies to address challenges such as floods, wildfires, drought, sea level rise, and the security of traditional foods and culturally important species. Through local and regional coordination and in partnership with Indigenous knowledge holders, efforts that incorporate Indigenous Knowledge can blend climate resilience and adaptation practices through learning and application strategies for restoration and stewardship of important habitats and ecosystem processes.

The Council wishes to emphasize three overarching principles that can be helpful in guiding the development of national climate adaptation science priorities:

- Encourage and invest in research that emphasizes "innovation" and innovative approaches to conducting research (e.g., as described in Stein et al., 2024[10])
- Center equity and participatory and integrative science in proposal solicitations and projects selected for funding
- Collaborate across and engage with organizations sharing adjacent missions (e.g., the national network of NOAA Climate Adaptation Partnerships; the NSF-funded Center for Braiding Indigenous Knowledges and Science; and other DOI Bureaus)

[10] Stein, B. A., J. A. Cushing, S. T. Jackson, M. Cross, W. Foden, L. M. Hallett, S. M. Hagerman, L. J. Hansen, J. J. Hellmann, D. Magness, G. F. Mendoza, C. Newsome, A. Pathak, S. M. Prober, J. H. Reynolds, and E. S. Zavaleta. 2024. Innovation in Climate Adaptation: Harnessing Innovation for Effective Biodiversity and Ecosystem Adaptation. Washington, DC: National Wildlife Federation.

National Science Priorities

While the focus of these initial recommendations for national science priorities is on specific topics, the subcommittee aspires to deliver recommendations in the future about frameworks and processes that can be used by the CASC network for developing national science priorities.

INITIAL RECOMMENDATIONS FOR NATIONAL SCIENCE PRIORITIES

Recommendation 1: Emergent and Transformative Risks	
Emerging climate risks	There is a need for proactive research to support understanding, identification, and monitoring of nascent climate threats to enhance preparedness and resilience at both system and local scales. Emerging climate risks encompass those not widely anticipated and about which relatively little is known.
Ecological transformation	Climate change is driving persistent changes in the composition, structure, and function of ecological systems that are not easily reversed. In the context of addressing ecological transformation, managers need regional, state, and local information to understand where, when, and how transformations may occur, and frameworks (such as "Resist, Accept, Direct") for managing them.
Thresholds & tipping points / Irreversibility	New research is needed to identify those risks that pose the potential for systems to undergo profound and accelerated transformations through permanent, unidirectional shifts, while also fostering a solutions-oriented mindset.
Recommendation 2: Science & Risk Communication	
Training in climate literacy and management decision-making under uncertainty	Two major contributions of CASC network are: (1) developing and nurturing the next generation of ecosystem researchers, stewards, managers and decision-makers through unique training programs for graduate students and postdoctoral researchers, and (2) building the capacity of fish, wildlife, and habitat managers across jurisdictional scales to make collaborative and science-based, climate-smart decisions. The substantial—and sustained—impacts these contributions have made are possible through the CASC network's commitment to innovative approaches to training. This work, which is currently authorized, should be endorsed, supported, and expanded at appropriate levels institutionally.
Translating current research and knowledge into public awareness and community engagement	Local decision-makers depend on data and findings that have been analyzed and translated into customized science-based information needed to assess and communicate risk levels associated with climate change. Incorporating new information; downscaling and visualizing risk data from national and regional data sources; sustaining existing and developing new visualization applications; and utilizing geospatial tools can all aid in the identification and communication of risk.
Advancing synthesis and accessibility of existing	Enhancing existing sensors, analytics, and forecasting tools in addition to developing new applications for predictive analytics, models, remote

information while expanding monitoring networks	monitoring, and analysis will aid decision-makers and resource managers in better integrating and aligning knowledge to the appropriate risk and scale for potential climate resilience and adaptation actions.
Transferability of adaptation actions	Transferability of adaptation actions is essential for scaling effective climate resilience strategies across CASCs and communities of natural resource practitioners. This involves adapting successful practices from one context to another through knowledge sharing, collaborative networks, and digital platforms. Modes or means of transferring lessons learned to collaborative disciplines, stakeholders, and the public require innovative education and training and is a needed service the CASC network is uniquely positioned to deliver.
Recommendation 3: Implementing & Evaluating Adaptation Actions	
Evaluating efficacy of pilot adaptation actions	As the National Climate Assessment and other authoritative sources of climate information for the U.S. government have illustrated, a sound adaptation and iterative risk management process includes a thoughtful and sustained approach to evaluating the efficacy of adaptation actions. Developing criteria metrics to evaluate climate adaptation success at the project and system level underpins building a public consensus for action. To reduce the risk of maladaptive practices and maximize the impact of funding, the Council recommends prioritizing support and assessment criteria for evaluating the effectiveness of pilot adaptation projects (in addition to funding for implementation).
Adaptation implementation science	Even as the evidence base for adaptation grows, implementation of effective adaptation actions by decision-makers may lag due to institutional, financial, or other barriers. Research is needed to not only understand such barriers, but also to design and test interventions for overcoming them (i.e., implementation science, adaptive management).
Recommendation 4: Innovative Approaches to Advancing Ecosystem Science	
Emphasize interdisciplinarity	Effectively supporting the adaptation of fish, wildlife, and habitat to climate change is an interdisciplinary endeavor by definition – spanning the multitude of disciplines embedded within the broad areas of Earth system science, natural resource management, and human systems. There is a need to focus more effort on interdisciplinary approaches to adaptation, especially as it relates to complex adaptive systems and how integrated systems (organizations, human communities, ecosystems, etc.) adapt or fail to adapt to a changing environment.
Utilize the ability and capacity to generate and integrate Big	Research outputs are sometimes obsolete by the time they have been peer reviewed and published. This is especially true of dynamic, non-stationary research topics, such as adapting to a changing climate. There is a need to integrate existing data into innovative tools (e.g., visualizations, models) that can adapt as data sources change, leverage multiple large data sources and artificial intelligence (AI), and inform repeated agency decisions (e.g.,

Data[11] in dynamic environments	prioritizing habitat projects, permitting, regulation setting). Such integration will facilitate cross-agency and connections to other actions within and outside of the federal government—and may necessitate an expansion of the data being collected.

Coral reefs at Ofu, American Samoa, CASC

[11] Large and diverse datasets too large for traditional computational tools available to most agencies, organizations, and Tribes. Historically, USGS has left it to others to organize and manage the warehousing of these data.

Recommendations for Partnerships and Community-Building

INTRODUCTION

The science produced by the CASCs happens in partnership with people on the land. This helps strengthen the ability of CASC partners to protect, understand, and manage natural resources and access the best climate adaptation expertise. These initial recommendations aim to advance the CASCs' partnerships and community-building efforts. They specifically focus on identifying best practices for connecting the climate adaptation science community. Future work by the subcommittee will cover additional areas, such as identifying best practices for partnering with organizations to jointly fund research or help develop research projects and finding ways to improve and better implement co-production efforts.

INITIAL RECOMMENDATIONS FOR PARTNERSHIPS AND COMMUNITY BUILDING

Recommendation 1: Partnerships and Community Building with Tribes	
Prioritize and address the potential to enhance partnerships and community building with Tribes consistent with government-to-government principles by ensuring that the USGS CASCs have the ability to enter into contracts, grants, cooperative agreements, and interagency agreements with Tribes in accordance with the CASCs' mission, in addition to agreements with host or consortium institutions	Continue to enter into agreements with Tribes through host or consortium institutions. This approach is particularly important for Tribes that may have limited capacity. Continue to support CASCs' ability to partner and directly enter into agreements with Tribes in ways that recognize the government-to-government relationship including new mechanisms outlined in the FY24 Congressional appropriation and other policies that may be available within the Department of the Interior (DOI).

This recommendation is meant to advance and foster direct partnerships between CASCs and Tribes and expand how the CASCs serve Tribes. Adapting to and mitigating the impacts of a changing climate will place significant demands on the regulatory, administrative, and management aspects of Indian tribes. In particular, development and operation of climate adaptation strategies require Tribes to establish or strengthen systems to protect their treaty interests, ensure access to and protection of sacred and cultural sites, and to otherwise protect the people, lands, and resources of the Tribes.

The Council recognizes the importance of intertribal organizations participating as CASC consortia members and having multiple pathways for tribal funding. This recommendation will not change or replace the current options for USGS agreements, i.e., entering into agreements with host or consortium institutions. There are over 500 federally recognized Tribes in the U.S. and some Tribes may not have the capacity to enter into individual

agreements with the USGS. This recommended practice is intended to support the option for individual Tribes that may have capacity to apply for individual agreements if they choose to do so.

The Council emphasizes that the ability for Tribes to directly apply for funding, in addition to funding avenues through host or consortium institutions, is in line with the government-to-government relationship principle and would allow Tribes and tribal consortia members to secure funding based on specific identified needs, in accordance with the CASCs' mission. In some cases, there are differences in needs and interests between individual Tribes and tribal consortia, through which funds are currently allocated. Individual agreements would create more sustainable relationships and direct engagement and would allow Tribes to potentially access more funds.

As part of the FY24 appropriations, recent guidance was issued to USGS science centers on the ability to enter into agreements with Tribes. The USGS Office of Acquisition and Grants (OAG) is determining how the CASCs can implement this guidance and directly fund Tribes. The Council understands that the CASCs and the Tribes will determine the best delivery mechanisms for this type of partnership to ensure that all Tribes have equitable access to resources, including through non-competitive awards, regardless of their capacity. To date, the CASCs have followed internal USGS policies to guide the program's operations, including policies related to the process for dispersing funds, engaging in partnerships, and awarding funds to Tribes.

Recommendation 2: Leveraging Training and Capacity Building to Advance Partnerships and Science Delivery	
Expand on existing mechanisms for the USGS CASCs to allocate resources for training and capacity building as part of its science and data-related activities, to create a better connection between the climate adaptation community and advance science delivery.	Recognize, empower, and amplify opportunities to leverage existing regional activities (e.g., annual meetings) as a space for training and informal education and the formation of partnerships with professional associations.[12] Deepen connections to interagency training resources in order to benefit CASC researchers and partners, leading to improved adaptation outcomes. Expand development of synthesis science[13] creating a pathway for more co-production and training opportunities. Support opportunities that provide the CASCs with the appropriate authority to address training and capacity building with partners.

[12] A professional association is an organization that aims to advance a certain industry and/or academic discipline, develop the growth of professionals in the field, and provide a service to help their common community. Professional associations in the United States range from organizations that set standards for both members and practice, such as the American Society of Civil Engineers (ASCE) and American Bar Association to organizations that provide opportunities for collaboration, sharing of best practices, and mentorship to emerging professionals, such as Institute for Tribal Environmental Professionals (ITEP) and American Society of Adaptation Professionals (ASAP).

[13] Synthesis science or research is the integration of existing knowledge to gain new insight. Typically, it is a process in which multiple existing data sets or sources are integrated with each other to address a new question or challenge. Synthesis is often conducted collaboratively across scientific and professional disciplines, combining academic and non-academic data and knowledge. The aim is to generate new knowledge by leveraging data from multiple sources, understand complexity across scales, identify patterns in linked natural or human-natural (socioecological) linked systems, and deliver findings that are applicable for decision-making, management, and policy.

Partnerships and Community-Building

The CASCs can allocate funds for science or data-related activities, which include, but often overlook capacity building and training. Training and capacity building activities allow for building and enhancing partnerships, strengthening the capacity of the CASCs and partners through science delivery, and supporting the development of the next generation of scientists and natural resource managers who are trained in climate adaptation. In addition to being an essential component of the CASCs' science and data-related activities, training and capacity building allows the CASCs to conduct their mission to deliver science and transfer knowledge to multiple partners to meet the challenges of climate change.

Training is often overlooked as an allowable element of CASC programming despite training being a clearly identified function of research in the Code of Federal Regulations (CFR) 2 section 200.1, on Research and Development[14]. Within this section, the term "research" includes activities involving the training of individuals in research techniques where such activities utilize the same facilities as other R&D activities and when such activities are not included in the instruction function.

The engagement process starts with building relationships and trust which sometimes may take place as part of gatherings of partners in their home jurisdictions and communities; formal support for convenings – large and small – is needed to build trust and relationships that give way to tools, strategies, or resources needed to advance the CASC mission. Training allows for a more systematic and supportive way for CASCs to elevate these informal relationships, share lessons across the network, and learn new and improve existing practices together.

The Council also recognizes that research conducted through universities, by students, is an invaluable and irreplaceable contribution to federal research and science. University-led research initiatives provide research and training opportunities that benefit individual participants and develop future scientists, benefiting the whole of society.

The nature of the CASCs' research provides a unique opportunity for place-based training which orients participants to specific communities and ecosystems, and how climate change is affecting those places, people, and systems. Regardless of the audience for a given training, encouraging deep connection to place-based experiences, expertise, and change is necessary for the translation of climate science into usable decision-making resources. Funding and implementing training programs that serve cohorts of students from non-traditional institutions, and under-represented backgrounds on climate adaptation will strengthen communities and add important expertise, perspectives, and voices to the adaptation science community of practice.

Some audiences that benefit from training include:

- Science community – learning how to transfer knowledge and information in culturally sensitive and appropriate ways;
- USGS information/resource users including ecosystem managers, state and local land managers, Tribes and Tribal serving organizations;

[14] "As defined in 2 CFR section 200.1, Research and Development, 'research' is a systematic study directed toward fuller scientific knowledge or understanding of the subject studied. The term "research" also includes activities involving the training of individuals in research techniques where such activities utilize the same facilities as other R&D activities and when such activities are not included in the instruction function." Source: https://www.whitehouse.gov/wp-content/uploads/2023/05/Part-5-Clusters-of-Programs.pdf

Partnerships and Community-Building

- Future climate science workforce who will benefit from having training in communicating science findings in meaningful ways and engaging with non-scientists in the development and delivery of science.

The Council recognizes the role that the CASCs play in generating the expertise needed for science-based solutions and adaptation work. This important role could bear greater benefit by enabling and funding CASCs' connection with climate service providers in the public and private sectors including the climate adaptation workforce.

Recommendations for Science Delivery

INTRODUCTION

The CASCs are working to design and implement a pilot technical support program to help agencies with natural and cultural resource management missions access, use, and interpret emerging and existing climate adaptation data, tools, and science to address their pressing climate adaptation science needs. This program is provisionally known as the USGS Climate Adaptation Technical Support (CATS) program.

To date, CASCs have focused mostly on research projects that span 1 to 3+ years. Partners have expressed a need for technical support that can be responsive to their requests in hours to months. Such a program would:

- Focus on climate adaptation science, data, tools for resource managers
- Complement (not duplicate) partner capabilities
- Promote shared learning and strategic duplication of core skills to prevent bottlenecks of expertise
- Learn and leverage resources across the entire CASC network
- Iteratively incorporate new science, data, and methods
- Provide feedback to researchers and regional leadership on priority agency science needs

There are several challenges CASCs face in providing this kind of expedited technical support. As a premier science agency, the USGS focuses on the creation of "new science," and utilizes rigorous and time-intensive peer review and publication processes to ensure that published science meets the highest scientific standards. As a result, USGS does not currently offer a publication series[15] appropriate to the kinds of routine, rapid science products needed for the CATS program. In addition, current, traditional research culture is not always based on a rapid, iterative, and adaptive systems approach for responding to the *increasing demand for tight-turnaround requests that the CATS program is designed to address*.

In response, the Council puts forward the following initial set of recommendations for near-term actions to address a subset of the challenges to the CATS program that it believes would be within the control of the USGS to implement. These initial recommendations focus on enabling the CASCs to deliver science in a timely manner by:

- Creating and implementing information technology policies and practices that reflect a cultural shift in CASC standard operating procedures to accommodate a more nimble, iterative, and adaptive workflow;
- Creating a publication series and accompanying requirements that facilitate rapid turnaround of science products; and
- Creating a CATS-specific, streamlined peer review process.

[15] https://www.usgs.gov/faqs/what-are-different-usgs-publication-series

Science Delivery

The Council believes these recommendations:

- Are strategically important to the CASC mission; and
- Would strengthen federal agency and partner relationships by providing for the application of USGS's unique and specialized science expertise to pressing land, water, and other resource management issues.

INITIAL RECOMMENDATIONS FOR SCIENCE DELIVERY

Recommendation 1: CATS Specific Information Technology Infrastructure and Processes

To ensure an effective CATS program, a culture of timely technical services must be fostered. Project management and product delivery at this level requires an agile and iterative approach, which is often different from the current and traditional pursuit of research throughout the CASC network. **The Council recommends the use of beneficial information technology (IT) systems and tools that would enable development of a structure and culture within the CATS program to deliver timely, effective, and rigorous science products using existing peer-reviewed science.**

Beneficial IT systems and tools would:

- Enable timely delivery of science products, while allowing for the iterative improvements of products.
- Structure team dynamics and delivery of defined, milestone-based tasks that contribute to the final product delivery within the requested timeframe.
- Enable and account for flexibility that allows changes to technology, systems, and processes and reduce down-time.

Recommendation 2: CATS Specific Publication and Peer Review Process[16]

For the CATS program to successfully meet the needs of its customers, it must produce citable science products[17] developed through a sufficiently rigorous, credible, and streamlined review and publication process. Since CATS products are envisioned as syntheses and/or interpretations of previously published science, a USGS publication series specific to these types of products would be beneficial and set expectations for the nature of these products. In addition, it is essential to adapt the traditional peer review process to reflect the interpretative nature of this previously published science, and seek innovative ways to streamline the review process by broadening and incentivizing the pool of potential reviewers and publication outlets. The following four recommendations focus on aspects of the publication and peer review processes.

Incentive quick turnarounds: Provide incentives such as recognition or stipends to reviewers for completing reviews	**Recognition Programs:** Establish recognition programs, such as awards or acknowledgments in publications, to motivate reviewers. This can include certificates, mentions in newsletters, or highlighting their contributions in annual reports.

[16] Tennant, J. P., Dugan, J. M., Graziotin, D., et al. (2017). "A multi-disciplinary perspective on emergent and future innovations in peer review." F1000Research. DOI: [10.12688/f1000research.12037.3] (https://f1000research.com/articles/6-1151/v3)

[17] Fundamental Science Practices (FSP) Procedures for Review and Bureau Approval of USGS Science Information Products, https://www.usgs.gov/office-of-science-quality-and-integrity/fundamental-science-practices-fsp-procedures-review-and

within a set timeframe. This approach has successfully been used in high-demand fields to expedite reviews.	**Stipends:** Providing stipends to peer reviewers enhances accessibility for those from underrepresented or economically disadvantaged backgrounds, and women, who might not have the same financial stability or institutional support as others. There are often significant disparities in pay and resources between institutions and career stages. Early-career researchers, adjunct faculty, and those from less affluent institutions often take on additional jobs or have heavier teaching loads, making unpaid peer review less feasible for them. Offering financial compensation helps level the playing field, ensuring a broader range of voices and expertise are represented in the peer review process. Several federal agencies currently pay peer/merit reviewers for grant proposals. The examples listed below could inform the creation of a stipend program for peer-review of CATS-related publications: • Interested in Becoming a BETO Project Reviewer? | Department of Energy • NSF Graduate Research Fellowships Program (GRFP) (nsfgrfp.org) • Office of Postsecondary Education - Peer Reviewers |Department of Education
Streamline peer-review processes	**Hierarchical Review System:** Establish a peer review system of CATS products based on the degree of the "Interpretive component" of the existing science being applied. For instance, products based on previously peer-reviewed data may only require a single expert review rather than a full panel. **Dedicated Publication Series:** Develop a new, or utilize an existing, series for CATS products that allows for rapid dissemination of findings, distinguishing between preliminary ("work in progress") and final versions of the reports. This series could have a faster internal review process focusing on the synthesis and interpretation of existing data. It would be responsive to the need for users (e.g., resource managers) to cite science in their decisions. It would be important to secure buy-in and support from relevant partners for the new publication series. **Provisional information:** Implement a model that enables CATS products to be transmitted quickly with a mechanism for post-transmission review and updates. This approach would balance the need for timely response with the opportunity for further refinement as needed. Mechanisms for notifying the recipients of any updates to the provisional information would need to be designed and implemented, as well.

Science Delivery

Utilize technology and collaborative platforms	**Project Management Tools:** Adopt methodologies and tools to enable authors, or others assigned to project management, to manage the review process more efficiently and track communications with reviewers, partners, and others involved. Tools like JIRA or Trello can help track workflow management progress and ensure timely completion of tasks. **Online Review Platforms:** Use platforms that facilitate quicker review cycles by allowing real-time collaboration and feedback, such as Overleaf for LaTeX documents or Google Docs for shared editing.
Utilize external collaborations	**Partnerships with Journals:** Collaborate with high-profile journals, with a priority for open-access journals, to establish fast-track lanes for CATS-related research to be published in their journal, to both diversify publication opportunities outside of USGS, and ensure that significant findings are reviewed and published swiftly. **Engagement with Professional Societies:** Work with societies like the American Geophysical Union (AGU), the Ecological Society of America (ESA), Tribal Science Council, and/or the Native American Fish and Wildlife Society to find experienced reviewers willing to engage in rapid reviews for urgent climate adaptation science.

USGS Landsat image showing glacial retreat, Alaska

Appendix 1: ACCAS Roster

Subcommittees:

- Science Priorities (SP)
- Partnerships and Community-Building (PCB)
- Science Delivery and Communications (SDC)

Name	Affiliation	Interest	Subcommittee Participation
David Reidmiller (Chair)	Gulf of Maine Research Institute	non-governmental organizations	SP, SDC
Collin O'Mara (Vice-Chair)	National Wildlife Federation	non-governmental organizations	---
Elizabeth Crosson	Metropolitan Water District of Southern California	state and local government	PCB
Michael Durglo, Jr.	Confederated Salish and Kootenai Tribes	Tribes and Indigenous organizations	PCB
Tim Fredricks	Bayer Crop Science	private industry	SP
Elizabeth Gibbons	Farallon Strategies	private industry	PCB
Ellen Herbert	Ducks Unlimited	non-governmental organizations	SP, PCB, SDC
Caleb Hickman	Cherokee Nation	Tribes and Indigenous organizations	--- New member, 8/2024
Christopher Hoving	Michigan Department of Natural Resources	state government	SP
Meade Krosby	University of Washington	academia and the CASC host institution network	SP
Harriet Morgan	Washington Department of Fish and Wildlife	state government	SP
Susan Natali	Woodwell Climate Research Center	non-governmental organizations	SP
Deyanira Nevárez Martínez	Michigan State University	academia	SDC

Appendices

Benjamin Preston	Rand Corporation	non-governmental organizations	SP, SDC
Erin Sikorsky	Center for Climate and Security	non-governmental organizations	PCB
Mervyn Tano[18]	International Institute for Indigenous Resource Management	Tribes and Indigenous organizations	PCB, SDC
Galen Treuer	Miami-Dade County	local government	PCB
Tiffany Turner	Duke Energy	private industry	SDC
Robert VanZile Jr.[19]	Sokaogon Chippewa Community	Tribes and Indigenous organizations	---
David Wegner	Woolpert Engineering	private industry	SP

[18] Mervyn Tano passed away on September 18, 2024.

[19] Chairman VanZile was an appointed Council member unable to actively participate in the Council, and did not contribute to this report.

Appendix 2: ACCAS Charter

U.S. Department of the Interior
U.S. Geological Survey

Advisory Council for Climate Adaptation Science Charter

1. **Committee's Official Designation.** The official designation of the committee is the Advisory Council for Climate Adaptation Science (Council).

2. **Authority.** The Council is in the public interest in connection with the responsibilities of the Department of the Interior (DOI) under Section 2 of the Reorganization Plan No. 3 of 1950 (64 Stat. 1262). as amended, and the Consolidated Appropriations Act of 2008, P.L. 110-161 Division F, Title I. The Council is regulated by the Federal Advisory Committee Act (FACA), as amended, 5 U.S.C. Ch. 10.

3. **Objectives and Scope of Activities.** The Council advises the Secretary of the Interior (Secretary) on the operations of the U.S. Geological Survey (USGS) National Climate Adaptation Science Center (NCASC) and its nine regional Climate Adaptation Science Centers (CASCs).

4. **Description of Duties.** The duties of the Council shall include:

   A. Advising on the contents of a national strategy identifying key climate adaptation science priorities to advance the management of natural and cultural resources in the face of climate change.

   B. Advising on the nature, extent, and quality of relations with and facilitating engagement of key partners at the regional/CASC level.

   C. Advising on the nature and effectiveness of mechanisms to effectively deliver science information and tools, and build capacity, to aid the natural and cultural resource management community and decision-makers in adapting to a changing climate.

   D. Advising on mechanisms that may be employed by the NCASC to ensure high standards of scientific quality and integrity in its products.

   E. Advising on the integration of equity, particularly for historically underserved communities, in the operation of the NCASC and regional CASCs.

5. **Official to Whom the Council Reports.** The Council reports to the Secretary through the Director, USGS, or the Designated Federal Officer (DFO).

6. **Support.** Administrative and logistical support for the Council will be provided by USGS.

7. **Estimated Annual Operating Costs and Staff Years.** The annual operating costs associated with supporting the Council's functions are estimated to be approximately $200,000, including all direct and indirect expenses and 0.50 Federal staff years support.

8. **Designated Federal Officer.** The DFO is an employee with the National Climate Adaptation Science Center, who is a full-time Federal employee appointed in accordance with Agency procedures. The DFO will approve or call all Council and subcommittee meetings, prepare and approve all meeting agendas, attend all Council and subcommittee meetings, adjourn any meeting when the DFO determines adjournment to be in the public interest, and chair meetings when directed to do so by the Secretary.

9. **Estimated Number and Frequency of Meetings.** The Council will meet approximately one to two times annually, and at such other times as designated by the DFO.

10. **Duration.** Continuing.

11. **Termination.** The Council will terminate two years from the date the charter is filed, unless, prior to that date it is renewed in accordance with the provisions of section 14 of F ACA. The Council will not meet or take any action without a valid current charter.

12. **Membership and Appointment.** The Council shall consist of not more than 20 members who represent the diversity of the nation's constituencies, and include the following interests:

- State and local governments, including state membership entities
- Non-governmental organizations whose primary mission is conservation and related scientific and advocacy activities
- Tribes and Indigenous organizations
- Academia
- Other sectors, environmental justice organizations, private industry

The Council may include scientific experts, and will include rotating representation from one or more of the institutions that host the Climate Adaptation Science Centers.

Alternate members may be appointed to the Council. Alternate members must be approved and appointed by the Secretary before attending meetings as representatives. Alternate members shall have experience and/or expertise similar to that of the primary member.

Non-Federal members of the Council will serve without compensation. However, while away from their homes or regular places of business, non-Federal Council and subcommittee members, including alternate members, engaged in Council, or subcommittee business, approved by the DFO, may be allowed travel expenses, including per diem in lieu of subsistence, in the same manner as persons employed intermittently in Government service under 5 U.S.C. § 5703.

Members will be appointed for 2- or 3- year terms. A vacancy on the Council will be filled in the same manner in which the original appointment was made. Members serve at the discretion of the Secretary.

The Secretary will appoint the Council Chair.

13. **Ethics Responsibilities of Members.**

a. **Special Government Employee Members.** Members of the Council appointed as special Government employees (SGEs) are subject to applicable Federal ethics statutes and regulations, to include applicable exceptions and exemptions. Additionally, SGE members are required, prior to appointment and annually thereafter, to file a Confidential Financial Disclosure Report. SGE members are also required to receive initial ethics training prior to performing any Council duties and to receive annual ethics training thereafter. The Department will provide materials to those members serving as SGEs, explaining their ethical obligations.

b. **Non-Federal Members Who Are Not Special Government Employees.** Non-Federal members of the Council and subcommittees appointed as representatives are not subject to Federal ethics statutes and regulations. However, no non-Federal Council or subcommittee members will participate in any Council or subcommittee deliberations or votes relating to a specific party matter before the Department or its bureaus and offices including a lease, license, permit, contract, grant, claim, agreement, or litigation, in which the member or the entity the member represents has a direct financial interest.

14. **Subcommittees.** Subject to the DFO's approval, subcommittees may be formed for the purposes of compiling information or conducting research. However, such subcommittees must act only under the direction of the DFO and must report their recommendations to the full Council for consideration. Subcommittees must not provide advice or work products directly to the Department. Subcommittees will meet as necessary to accomplish their assignments, subject to the approval of the DFO and the availability of resources.

15. **Recordkeeping**. The records of the Council, and formally or informally established subcommittee of the Council, shall be handled in accordance with General Records Schedule 6.2 and other approved Agency records disposition schedules. These records shall be available for public inspection and copying, subject to the Freedom of Information Act, 5 U.S.C. § 552.

Secretary of the Interior

NOV 2 3 2022

Date

Date Filed