Toward an ethical framework for climate services

A White Paper of the Climate Services Partnership Working Group on Climate Services Ethics

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Intended audience. This paper is intended to spur thinking and dialogue among the wide and relatively diverse community of actors engaged in practical activities surrounding the production, translation, transfer and use of climate information for societal decision making.

Process. This white paper is intended to start a conversation on ethics in the climate services community. To that end, the CSP Working Group on Climate Services Ethics is accepting comments on this white paper online at www.climate-services.org/ethics.

Endorsement. Since 2013, the CSP has fostered a dialogue around climate service ethics, supported and endorsed by partners including the START Secretariat, the Red Cross/Red Crescent Climate Centre, the Climate Change Agriculture & Food Security theme of the Consultative Group for International Agriculture Research, the Global Framework for Climate Services, and the Climate Knowledge Brokers group. Endorsement of the process of discussion around climate services ethics does not imply that partners are in full agreement with the contents of the paper but does indicate support for the spirit in which it was written.

The Climate Services Partnership is an informal network of climate information users, providers, researchers and funders working to improve the development and delivery of climate services around the world.
Preamble

The impacts of climate variability and change are immediate, intensifying, and potentially dangerous. Climate services offer valuable information and tools that allow users to anticipate or address these impacts. However, climate services lack a cohesive ethical framework to govern their development and application. This paper is an early step in an open-ended process to establish a set of ethical principles to ensure that climate services are effectively deployed to manage climate risks, realize opportunities, and advance human security.

The need for a climate service ethic is significant and growing. To date, a multiplicity of competing interests and motivations across individuals and institutions has led to poor cohesion within the climate services community. Growing awareness of climate impacts has raised interest and investments in climate services across sectors and around the world. This has also led to the entrance of new actors seeking to provide these services. User demand for climate services is also rising, as is demand for new types of services.

This urgency is heightened by recognition that negative consequences can arise when climate services should be used and are not, and/or from the deployment of such services in ways that bias (implicitly or explicitly) an outcome. Meanwhile, there has been growing pressure from funders to operationalize climate research. With a range of evolving practices, there is increasing scope for malpractice and maladaptation. Hence, there is a time imperative to articulate a set of ethical principles to guide this emerging field.

There is no agreed upon governance for developing or applying climate services. Major efforts are underway to provide structure to these endeavors, including the Global Framework on Climate Services (GFCS) which “guide[s] the development and application of science-based climate information and services in support of decision-making in climate sensitive sector.”¹ GFCS is governed by eight principles, but these pertain to the organization’s policy rather than to the remit of climate services per se.

<table>
<thead>
<tr>
<th>Box 1: We believe that ...</th>
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<tr>
<td>Climate science has the potential to improve human well being.</td>
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<td>Users needs should inform climate services provided.</td>
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<td>The value systems and decision frameworks of users should be central to climate service delivery.</td>
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<td>Climate service providers should consider the consequences of their actions for those who may use or be affected by the use of climate service products.</td>
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<tr>
<td>Climate service providers should be accountable for the integrity and transparency of their practices and products.</td>
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<tr>
<td>No individual or institutions has a monopoly on climate knowledge or scientific authority.</td>
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<tr>
<td>Climate service products should be open to scrutiny and comparison.</td>
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<td>Public data is a public good.</td>
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¹. The Global Framework on Climate Services (GFCS) is a framework for the development and application of science-based climate information and services in support of decision-making in climate sensitive sectors. It is governed by eight principles that guide its development and application.
Other relevant codes exist (WMO,\textsuperscript{2} FAO,\textsuperscript{3} NOAA,\textsuperscript{4} FCFA\textsuperscript{5}), but these are typically focused on specific regions or sectors or international climate change negotiations rather than the mainstreaming of climate information services. Recognizing this vacuum in guidance, this paper is an early step in an iterative process to establish a set of ethical principles to aid the climate services community.

The principles and practices that constitute this ethical framework are born from a set of reference points laid out in Box 1. While these views do not necessarily reflect those held by all stakeholders in climate services; they are, however, based on diverse experiences encompassing both western and developing countries, fundamental and applied climate research, various sectors, gender, and professional practice (academia, private sector, government).

This paper is intended for a broad audience. We hope that climate service providers (whether they are academics, in the private sector, engaged with national meteorological or hydrological services, or representing other types of organizations) will test this prototype framework against their own experiences and products. Likewise, climate services users can judge the principles presented, evaluate products delivered to them, and hold producers to account. International agencies (e.g. GFCS, IPCC) can bring valuable perspectives and leadership to the conversation, as well as provide insight into the development and operationalization of an authoritative framework. All readers are invited to reflect on this content, share their own perspectives, and support an iterative process of testing and refinement. For reference, a glossary of terms is included in Box 2.

In the following sections, we briefly present the motivational factors that inform our approach; articulate an ethical framework for climate services; and use this framework to derive principles that can guide behavior with respect to climate service products and practice. We conclude with some goals for the future in terms of the ethical implementation of climate services.

**Climate service motivations**

The starting point for climate services as a response to climate variability and change is rooted in human security and risk management. These objectives provide the core motivations behind the world’s response to climate change, including through research agendas, burgeoning climate services, the investment of resources, and the implementation of policy and adaptation practices.

*Human security* has emerged in recent decades as a discourse that complements the closely related notions of human development and human rights.\textsuperscript{6} In general terms, human security has been defined as freedom from want and freedom from fear; more specifically, it involves the ability to respond to critical and pervasive threats.\textsuperscript{7} In this sense, human security articulates a guiding principle of individual actions that can be used to steer societies’ collective responses;
for our discussion, the advancement of human security on the individual and collective scale is a key outcome that climate services seek to support. 

*Risk management* involves the identification, assessment, and prioritization of risks, followed by the coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or maximize the realization of opportunities. The perceived risk, and the level of acceptable risk, will of course be strongly biased by individual, institutional, or external contexts, and any consequent decision may be self-serving or altruistic. Nonetheless, the minimization of risk strongly conditions decisions; improving the capacity of actors and of society to manage climate-related risk is a fundamental goal of climate services.

Thus we adopt the complementary goals of minimizing risk and optimizing human security as two foundational concepts to frame our discussion of the principles for ethical implementation of climate services. That is, we posit that ethical climate service products and practices should inherently contribute to the maximization of human security at the individual and collective scale, and likewise maximize the avoidance of negative consequences from climate impacts. An ethical framework is set out below.

### An ethical framework for climate services

Actions in pursuit of human security and risk management take place within a framework of values. While values vary across society, we commend four core elements intrinsic to the production of climate services: integrity, transparency, humility, and collaboration. Not all of these terms can be found in the science literature on climate variability and change; for some, these value-laden terms may even be uncomfortable when considered in a context of western, post-modern, and relativistic worldviews. We nevertheless see these values as integral to the development and delivery of climate services that will effectively and equitably advance human security and risk management. Each is described in more detail below.

**Integrity** is about conduct in practice. All too often integrity and honesty can become suppressed in the contexts of personal interests, commercial pressures and competitive practices aimed at gaining advantage. Integrity is essential to ensuring that climate services do not, through obfuscation or exaggeration of knowledge, contribute to the disadvantaging of those they seek to serve. It warrants mention that honesty about ones ignorance is central to integrity.

**Transparency** lies at the heart of building trust between communities. As climate services are inherently about relationships, and as relationships are predicated on trust, transparency is an integral part of any climate service. Opaquelessness about a climate service provider’s methods, sources or approaches to interpretation can contribute to inflated perceptions of the value of information. Over time, this can lead to a breakdown of trust in the individual climate service provider, and within the broader services community.
Humility, the third leg of the framing values, is perhaps a term least expected in the context of climate change. We define humility to mean not presenting information as more than it is, nor less than it is; not promising more than can be delivered, nor obscuring an underlying reality of uncertainty. Humility thus reflects a commitment to present the true value of a product, process or service as honestly and transparently as possible. This raises the commensurate challenge to the purveyor of the service to be cognizant of the service's strengths and its limitations.

Collaboration is the cornerstone of climate services. As in many other scientific fields, climate information is made useful to society only when fundamental and applied researchers work together with technical actors, government officials and members of civil society. Openness to collaboration, entails listening to user needs, allowing for their input and engaging in a process of co-production of climate services to ensure that the outputs of this process address real-world problems, decision contexts and capacities; it also ensures that climate services are based on state-of-the-art products and the exchange of best practices.

Thus, we argue that the values of integrity, transparency, humility, and collaboration are integral to the development and delivery of climate services that serve the core motivations of human security and risk management. The following section uses these values in the development of principles to guide the practice and products of climate services, providing climate information users and providers with guidelines for ethical behavior and good practice.

Principles of ethical practice in climate services

The values of integrity, transparency, humility, and collaboration inform principles that can guide climate service providers with regards to the tools and products they develop and the processes by which those tools are conceived, elaborated, disseminated, and discussed. It is our hope that these principles will also be reviewed by climate service users (and potential users), who may see these principles as minimum requirements for any climate information providers they may engage. These principles are included below.

**Principles of Practice**

**Climate service providers should communicate value judgments.** Value judgments are an implicit but often unacknowledged part of risk analysis. These judgments should be made clear to climate service users to inform their understanding of the sort of analysis they can expect. Value judgments play a central role in triggering the decision to engage in risk analysis; they also condition the sorts of risks examined, the kinds of data considered relevant and valid, the risk management techniques considered, and the options deemed acceptable.

Without a clear and explicit expression of the value judgments of a climate service provider, users will not understand the basis for the decisions that are made nor will they be able to
appropriately assess the extent to which those judgments are consistent with their own worldview.

**Climate service providers should communicate principles of practice.** Value judgments inform certain practices, including the methods by which climate service producers source, analyze, and present information. Making these practices explicit will ensure that climate service users understand the context in which their information is produced and delivered and the context in which it is expected to be used.

**Climate service providers should engage with their community of practice.** In the rapidly developing field of climate services, climate service providers need to continually update their skills and knowledge—leaning on the increasingly diverse community of practice to learn about new methodologies and techniques. Those service providers who isolate themselves from the larger community run the risk of failing out of touch with these development; they also limit scope for learning from others’ positive and negative experiences. The services they develop will reflect this.

Ethical climate service providers should strive to keep themselves up to date with the latest data and analysis techniques. They should be engaged in their community of practice and may have experience working with clients in a particular sector; indicators of such behavior include participation in professional bodies, conference attendance, publication output, and evidence of further training.

**Climate service providers should engage in the co-exploration of knowledge.** Even those climate service providers engaged with their community of practice may not have experience in the particular context of every user, nor will they understand the challenges that each user faces or the circumstances that inform those decisions. To accommodate this, climate information providers will need to work closely with users to understand the context in which they work in order to produce tools that can be used to improve decision making in their day-to-day context.

In this sense, it is imperative that both the climate information user and provider see the development of climate information products as a process of co-exploration in which they work together to identify and, ideally, produce useful and usable information. Opportunities for co-exploration may be maximized by physical co-location, including the use of secondments that allow for fluid dialogue between climate information users and providers.

**Climate service providers should understand climate as an additional stressor.** As we better understand the impacts that we can expect from climate change, the notion, once common among climate experts, that climate variability and change are the only problems facing communities is slowly receding. This is a good thing: the risks associated with climate variability and change are part of the multidimensional threats facing states, businesses, communities, and individuals at any one time. Good climate service providers will understand this and embed a more holistic sense of climate-in-context into their analyses. This increases the likelihood that any actions taken will maximize benefits and will be resilient to multiple climate/non-climatic pressures.
Climate service providers should provide metrics of the value of their products. Just as marketers should provide customers with the information they need to make a decision regarding what to purchase, climate service providers should provide information on the relative value of their product. These sorts of metrics will vary from case to case, but may include information on the skill, bias, and/or uncertainty associated with each product.

The producer should also make an attempt to illustrate the overall added value of using a product in context, including the extent to which it can be expected to improve outcomes, so that users can feel confident in applying the product to their own decisions. In this context, the climate service user may also consider and provide information about the range of consequences of such decisions.

Climate service providers should communicate appropriately. Words are important, and it’s important that climate service providers chose their words carefully in order to illuminate and educate, rather than exclude. In this sense, it is important to remember that climate service providers have an obligation to communicate with users in terms that are understandable, reducing jargon where possible and explaining it in simple language where it is not. Exclusionary, manipulative, careless, or confusing language should not be tolerated. It is important, for instance, that climate service users consistently and appropriately use potentially ambiguous terms such as “prediction,” “forecast,” “scenario,” and “projection.”

Issues around communication apply not just to words, but also to visualizations. While data visualization is one of the most important tools that climate service providers employ to communicate information and potentially influence decisions, it is just as easy to mislead as to educate with charts, graphs, and maps. To avoid this, it is critical that data visualizations be clear, straightforward, and presented without intent to obfuscate or exaggerate. Climate service providers should focus on how the users will interpret the visualizations, bearing in mind that user communities’ experience with such visualizations may be minimal.

Climate service providers should also consider appropriate mechanisms to transmit knowledge to users and others that may be interested in the outputs of their analysis. Putting maps on a website is not very helpful when climate service providers are attempting to pass along information to actors who may not have Internet access, for instance. In these cases, climate service providers should consider disseminating information through alternative means, including radio, text message, or interactive workshops. Users’ technical capacity should be contextualized so as to ensure the ultimate message is received.

Climate service providers should articulate processes for refreshing and revising information. Scientific understanding is always evolving – new methodologies are developed, new data are made available – which means that climate service products can potentially go out of date. In some cases, climate service providers may also make mistakes that result in subpar or even harmful decisions. It is important that climate service users and providers discuss these possibilities up front and develop shared expectations regarding the life of the product, the ways in which it may be refreshed or revised over time, and how the provider will
address mistakes or errors that come to light. Climate service providers must document and clearly distinguish different versions of the same product.

**Climate service providers should have mechanisms for monitoring and evaluation of procedures and products.** The monitoring and evaluation of climate services is still not as common as it should be and, in some cases, additional research must be done in order to identify appropriate metrics to assess the extent to which climate services contribute to improved outcomes. Nevertheless, all climate services should maintain a monitoring and evaluation protocol that can allow climate information users and providers to understand the extent to which the service is delivering intended benefits; this protocol should also provide the justification for adjustments to fit changing socioeconomic needs and a changing understanding of climate science.

While evaluation and monitoring protocols may take many forms, customer satisfaction surveys are one tool that has been shown to provide useful information. Other mechanisms include periodic review (sometimes a statutory requirement for safety cases) or guidelines produced by technical advisory groups.

**Climate service providers should declare any conflicts of interest and/or vested interests.** As in all professional practices, it is important that climate service providers declare any conflicts of interest they may have. In the case of climate services, this may include personal interests in disseminating certain datasets and/or methodological techniques; in certain cases, climate service providers may also stand to gain financially, professionally, or otherwise, from the decisions that climate services inform. In all cases, climate service providers should declare such conflicts so that users can fully understand the motivations of their information providers.

**Climate service users and providers should share the responsibility of climate information outcomes.** Climate service providers who use the guidelines presented here, and who generally act in a way that is consistent with the values of integrity, transparency, humility, and collaboration, carry a level of accountability for the work they do, and for the ultimate outcomes. Nevertheless, it is ultimately the user that will turn information into action, affecting lives and livelihoods. As a result, it is the user that will need to take responsibility for understanding the climate information products available to them and for using them in a way that is consistent with their values and principles.

**Principles of Product**

**Climate service products should be credible and defensible.** Information on which climate service products are based should be properly sourced, and the provenance of that information must be made clear and easily accessible. The analyses that underpin climate services should rely on appropriate and well-documented methodologies; tools and methods should be justified and comparative analyses should be used when appropriate.
Climate service products should include detailed descriptions of uncertainty. Uncertainty in climate services may derive from different sources. This includes, but is not limited to, initial condition uncertainty, which defines the starting point of a system; structural uncertainty, which reflects a lack of knowledge regarding the physical mechanisms that condition the climate system; and parameter uncertainty, which includes uncertainties regarding model inputs. It is essential that climate services describe the size and sources of such uncertainty in terms that are meaningful to the intended user.

Climate service products should be fit for purpose. Climate services should be designed in order to provide users with information that can easily inform the decisions to which they are targeted. Tools and products must be appropriate for specific contexts; this will often require information to be tailored with respect to geographic and temporal scales and to match the context and language in which intended users are accustomed to working.

Climate service products should be documented. It is critical that climate services document both the information and methods on which they are based, allowing products to be reproduced and verified by independent third parties. Users themselves should also have access to relevant information, in order to facilitate learning and decision making. Meta-data and version history are important components of this and should be clearly accessible in all climate service products.

As information and methodologies improve, climate services should include provisions for the revision and refreshing of information so that climate information users can continue to derive benefit from them, even as new methodologies and data sources evolve. It should not be presumed that the best information is the latest product version.

Conclusions

Climate services have the potential to contribute to the maximization of human security and the avoidance of negative consequences. As the climate continues to change, society will increasingly turn to climate services to help them understand risks and to guide them in taking advantage of climate-related opportunities. Given a position of trust, climate information providers and the products they generate must be held to the highest ethical standard. Climate service providers that do not consider the consequences of their actions may contribute to maladaptation, with associated losses for their clients and/or society as a whole.

We have outlined the core values that we believe should inform a climate service that help guide behavior in this emerging field; we have also interpreted these values with respect to the products and practices of climate services. We see this paper as a first step in a community-wide discussion regarding standards and accountability; we are eager to hear others’ opinions regarding what we can and should expect from climate service providers and will look forward to continuing this dialogue in a range of venues. Honing and articulating our shared values will benefit not just the emerging field of climate services, but society as a whole.
1 GFCS principles: http://www.wmo.int/gfcs/
2 WMO Code of Ethics: https://www.wmo.int/pages/governance/ethics/Code%20of%20Ethics%20%E.pdf
### Glossary

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<th>Term</th>
<th>Definition</th>
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<tr>
<td>Climate forecast</td>
<td>A statement about the future evolution of some aspects of the climate system encompassing both forced and internally generated components. Climate forecasts are generally used as a synonym of climate predictions (EUPORIAS)</td>
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<tr>
<td>Climate information producer</td>
<td>An individual or agency that offers climate information services and products</td>
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<tr>
<td>Climate information user</td>
<td>An individual or agency that requires climate information for effective decision-making</td>
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<tr>
<td>Climate prediction</td>
<td>An attempt to produce (starting from a particular state of the climate system) an estimate of the actual evolution of the climate in the future, for example, at seasonal, interannual or decadal time scales (EUPORIAS)</td>
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<tr>
<td>Climate services</td>
<td>An end-to-end system that provides climate information that is prepared and delivered to meet a users’ need (GFCS)</td>
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<td>Climate-sensitive decision</td>
<td>A choice that may partly or wholly depend on the anticipated state and/or behavior of the climate system</td>
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<td>Ethics</td>
<td>A set of concepts and principles that guide personal and institutional conduct</td>
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<td>Human security</td>
<td>The right for all people to a quality of life absent of violence, poverty and despair; and the entitlement to freedom from fear, from want and the freedom of future generations to inherit a healthy natural environment (UNDP)</td>
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<tr>
<td>Humility</td>
<td>The quality of expressing true ability to quantify uncertainty and outcomes without over-emphasizing or under-emphasizing the ability of the producers’ process, practice or product</td>
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<td>Integrity</td>
<td>The quality of being honest and following ethical principles</td>
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<td>Maladaptation</td>
<td>Policies or actions that result in an increased vulnerability to climate-related risks</td>
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<tr>
<td>Principle of practice</td>
<td>An ethical standard that exemplifies the best quality of personal and professional practice, regardless of agency affiliation</td>
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<tr>
<td>Principle of product</td>
<td>An ethical standard that exemplifies the characteristics of an optimal climate service product, regardless of agency affiliation</td>
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<tr>
<td>Projection</td>
<td>A projection is a potential future evolution of a quantity or set of quantities, often computed with the aid of a climate model. Unlike predictions, projections are conditional on assumptions concerning, for example, future socioeconomic and technological developments that may or may not be realized (EUPORIAS)</td>
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<tr>
<td>Risk management</td>
<td>The process of identifying, evaluating, selecting and implementing actions to reduce risk to human well being, assets, and/or ecosystems</td>
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<tr>
<td>Scenario</td>
<td>A scenario is a coherent, internally consistent and plausible description of a possible future state of the world. It is not a forecast; rather, each scenario is one alternative image of how the future can unfold (IPCC).</td>
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<tr>
<td>Transparency</td>
<td>A quality of the producer and user to provide explicit, traceable, and justifiable information throughout the climate service process</td>
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<tr>
<td>Value judgments</td>
<td>A determination of what is good or bad based on one’s standards or priorities</td>
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