# 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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Under the auspices of the Climate Services Partnership,
this paper was drafted by:

Peter Adams (Acclimatise)
Erika Eitland (Harvard University)
Bruce Hewitson (CSAG - University of Cape Town)
Catherine Vaughan (IRI - Columbia University)
Robert Wilby (Loughborough University)
Stephen Zebiak (IRI - Columbia University)

**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.

# 1    Preamble

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

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

15
16   This urgency is heightened by
17   recognition that negative consequences
18   can arise when climate services should
19   be used and are not, and/or from the
20   deployment of such services in ways that
21   bias (implicitly or explicitly) an outcome.
22   Meanwhile, there has been growing
23   pressure from funders to operationalize
24   climate research. With a range of
25   evolving practices, there is increasing
26   scope for malpractice and
27   maladaptation. Hence, there is a time
28   imperative to articulate a set of ethical
29   principles to guide this emerging field.

30   There is no agreed upon governance for
31   developing or applying climate services.
32   Major efforts are underway to provide

| **Box 1: We believe that …** |
| --- |
| Climate science has the potential to improve human well being. |
| Users needs should inform climate services provided. |
| The value systems and decision frameworks of users should be central to climate service delivery. |
| 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. |
| Climate service providers should be accountable for the integrity and transparency of their practices and products. |
| No individual or institutions has a monopoly on climate knowledge or scientific authority. |
| Climate service products should be open to scrutiny and comparison. |
| Public data is a public good. |

33   structure to these endeavors, including the Global Framework on Climate Services (GFCS) which
34   "guide[s] the development and application of science-based climate information and services in
35   support of decision-making in climate sensitive sector."[1] GFCS is governed by eight principles,
36   but these pertain to the organization's policy rather than to the remit of climate services *per se*.

37    Other relevant codes exist (WMO,[2] FAO,[3] NOAA,[4] FCFA[5*]), but these are typically focused on
38    specific regions or sectors or international climate change negotiations rather than the
39    mainstreaming of climate information services. Recognizing this vacuum in guidance, this paper
40    is an early step in an iterative process to establish a set of ethical principles to aid the climate
41    services community.

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

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

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

## 62    Climate service motivations

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

68    *Human security* has emerged in recent decades as a discourse that complements the closely
69    related notions of human development and human rights.[6] In general terms, human security
70    has been defined as freedom from want and freedom from fear; more specifically, it involves
71    the ability to respond to critical and pervasive threats.[7] In this sense, human security articulates
72    a guiding principle of individual actions that can be used to steer societies' collective responses;

73 for our discussion, the advancement of human security on the individual and collective scale is
74 a key outcome that climate services seek to support.
75 *Risk management* involves the identification, assessment, and prioritization of risks, followed
76 by the coordinated and economical application of resources to minimize, monitor, and control
77 the probability and/or impact of unfortunate events or maximize the realization of
78 opportunities. The perceived risk, and the level of acceptable risk, will of course be strongly
79 biased by individual, institutional, or external contexts, and any consequent decision may be
80 self-serving or altruistic. Nonetheless, the minimization of risk strongly conditions decisions;
81 improving the capacity of actors and of society to manage climate-related risk is a fundamental
82 goal of climate services.
83
84 Thus we adopt the complementary goals of minimizing risk and optimizing human security as
85 two foundational concepts to frame our discussion of the principles for ethical implementation
86 of climate services. That is, we posit that ethical climate service products and practices should
87 inherently contribute to the maximization of human security at the individual and collective
88 scale, and likewise maximize the avoidance of negative consequences from climate impacts. An
89 ethical framework is set out below.


## 90 An ethical framework for climate services

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

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

105 **Transparency** lies at the heart of building trust between communities. As climate
106 services are inherently about relationships, and as relationships are predicated on trust,
107 transparency is an integral part of any climate service. Opaqueness about a climate service
108 provider's methods, sources or approaches to interpretation can contribute to inflated
109 perceptions of the value of information. Over time, this can lead to a breakdown of trust in the
110 individual climate service provider, and within the broader services community.

111    **Humility**, the third leg of the framing values, is perhaps a l term least expected in the
112    context of climate change. We define humility to mean not presenting information as more
113    than it is, nor less than it is; not promising more than can be delivered, nor obscuring an
114    underlying reality of uncertainty. Humility thus reflects a commitment to present the true value
115    of a product, process or service as honestly and transparently as possible. This raises the
116    commensurate challenge to the purveyor of the service to be cognizant of the service's
117    strengths and its limitations.

118    **Collaboration** is the cornerstone of climate services. As in many other scientific fields,
119    climate information is made useful to society only when fundamental and applied researchers
120    work together with technical actors, government officials and members of civil society.
121    Openness to collaboration, entails listening to user needs, allowing for their input and engaging
122    in a process of co-production of climate services to ensure that the outputs of this process
123    address real-world problems, decision contexts and capacities; it also ensures that climate
124    services are based on state-of-the-art products and the exchange of best practices.
125
126    Thus, we argue that the values of integrity, transparency, humility, and collaboration are
127    integral to the development and delivery of climate services that serve the core motivations of
128    human security and risk management. The following section uses these values in the
129    development of principles to guide the practice and products of climate services, providing
130    climate information users and providers with guidelines for ethical behavior and good practice.

131    ## Principles of ethical practice in climate services

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

138    ### *Principles of Practice*

139    **Climate service providers should communicate value judgments.** Value judgments are
140    an implicit but often unacknowledged part of risk analysis. These judgments should be made
141    clear to climate service users to inform their understanding of the sort of analysis they can
142    expect. Value judgments play a central role in triggering the decision to engage in risk analysis;
143    they also condition the sorts of risks examined, the kinds of data considered relevant and valid,
144    the risk management techniques considered, and the options deemed acceptable.
145
146    Without a clear and explicit expression of the value judgments of a climate service provider,
147    users will not understand the basis for the decisions that are made nor will they be able to

148  appropriately assess the extent to which those judgments are consistent with their own
149  worldview.

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

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

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

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

174  In this sense, it is imperative that both the climate information user and provider see the
175  development of climate information products as a process of co-exploration in which they work
176  together to identify and, ideally, produce useful and usable information. Opportunities for co-
177  exploration may be maximized by physical co-location, including the use of secondments that
178  allow for fluid dialogue between climate information users and providers.[8]

**Climate service providers should understand climate as an additional stressor.** As we
180  better understand the impacts that we can expect from climate change, the notion, once
181  common among climate experts, that climate variability and change are the only problems
182  facing communities is slowly receding. This is a good thing: the risks associated with climate
183  variability and change are part of the multidimensional threats facing states, businesses,
184  communities, and individuals at any one time. Good climate service providers will understand
185  this and embed a more holistic sense of climate-in-context into their analyses. This increases
186  the likelihood that any actions taken will maximize benefits and will be resilient to multiple
187  climate/non-climatic pressures.

188       **Climate service providers should provide metrics of the value of their products.** Just as
189 marketers should provide customers with the information they need to make a decision
190 regarding what to purchase, climate service providers should provide information on the
191 relative value of their product. These sorts of metrics will vary from case to case, but may
192 include information on the skill, bias, and/or uncertainty associated with each product.

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

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

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

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

220       **Climate service providers should articulate processes for refreshing and revising**
221 **information.** Scientific understanding is always evolving – new methodologies are developed,
222 new data are made available – which means that climate service products can potentially go
223 out of date. In some cases, climate service providers may also make mistakes that result in
224 subpar or even harmful decisions. It is important that climate service users and providers
225 discuss these possibilities up front and develop shared expectations regarding the life of the
226 product, the ways in which it may be refreshed or revised over time, and how the provider will

227 address mistakes or errors that come to light. Climate service providers must document and
228 clearly distinguish different versions of the same product.

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

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

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

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

258 *Principles of Product*

259 **Climate service products should be credible and defensible**. Information on which
260 climate service products are based should be properly sourced, and the provenance of that
261 information must be made clear and easily accessible. The analyses that underpin climate
262 services should rely on appropriate and well-documented methodologies; tools and methods
263 should be justified and comparative analyses should be used when appropriate.

264   **Climate service products should include detailed descriptions of uncertainty.**
265   Uncertainty in climate services may derive from different sources. This includes, but is not
266   limited to, initial condition uncertainty, which defines the starting point of a system; structural
267   uncertainty, which reflects a lack of knowledge regarding the physical mechanisms that
268   condition the climate system; and parameter uncertainty, which includes uncertainties
269   regarding model inputs. It is essential that climate services describe the size and sources of such
270   uncertainty in terms that are meaningful to the intended user.

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

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

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


286   ## Conclusions
287
288   Climate services have the potential to contribute to the maximization of human security and
289   the avoidance of negative consequences. As the climate continues to change, society will
290   increasingly turn to climate services to help them understand risks and to guide them in taking
291   advantage of climate-related opportunities. Given a position of trust, climate information
292   providers and the products they generate must be held to the highest ethical standard. Climate
293   service providers that do not consider the consequences of their actions may contribute to
294   maladaptation, with associated losses for their clients and/or society as a whole.
295
296   We have outlined the core values that we believe should inform a climate service that help
297   guide behavior in this emerging field; we have also interpreted these values with respect to the
298   products and practices of climate services. We see this paper as a first step in a community-
299   wide discussion regarding standards and accountability; we are eager to hear others' opinions
300   regarding what we can and should expect from climate service providers and will look forward
301   to continuing this dialogue in a range of venues. Honing and articulating our shared values will
302   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

[3] FAO Code of Conduct for Responsible Fisheries: http://www.seafish.org/industry-support/guide-to-seafood-standards/measurement/fao-code-of-conduct-for-responsible-fisheries

[4] NOAA Summary of Ethics Rules
http://www.commerce.gov/sites/default/files/documents/2013/february/noaa_summary_of_ethics_rules-2013-e.pdf

[5] Jones, L., Dougill, A., Jones, R.,G., Steynor, A., Watkiss, P., Kane, C., Koelle, B., Moufouma-Okia, W., Padgham, J., Ranger, N., Roux, J.P., Suarez, P., Tanner, T. and K. Vincent. Ensuring climate information guides long-term development. (2015) Nature Climate Change. 5: 812-814.

[6] Gaspar, D. (2005). "Securing humanity – situating "human security" as a concept and discourse." Journal of Human Development. 6(2):221-245.

[7] Commission on Human Security (2003). *Human security now*. United Nations Commission on Human Security New York, NY.

[8] Le Quesne, T. et al. (2010). "Flowing forward: freshwater ecosystem adaptation to climate change in water resources management and biodiversity conversation."   World Bank Working Water Notes #28.

# Glossary

| | |
|---|---|
| Climate forecast | 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) |
| Climate information producer | An individual or agency that offers climate information services and products |
| Climate information user | An individual or agency that requires climate information for effective decision-making |
| Climate prediction | 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) |
| Climate services | An end-to-end system that provides climate information that is prepared and delivered to meet a users' need (GFCS) |
| Climate-sensitive decision | A choice that may partly or wholly depend on the anticipated state and/or behavior of the climate system |
| Ethics | A set of concepts and principles that guide personal and institutional conduct |
| Human security | 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) |
| Humility | 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 |
| Integrity | The quality of being honest and following ethical principles |
| Maladaptation | Policies or actions that result in an increased vulnerability to climate-related risks |
| Principle of practice | An ethical standard that exemplifies the best quality of personal and professional practice, regardless of agency affiliation |
| Principle of product | An ethical standard that exemplifies the characteristics of a optimal climate service product, regardless of agency affiliation |
| Projection | 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) |
| Risk management | The process of identifying, evaluating, selecting and implementing actions to reduce risk to human well being, assets, and/or ecosystems |
| Scenario | 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). |
| Transparency | A quality of the producer and user to provide explicit, traceable, and justifiable information throughout the climate service process |
| Value judgments | A determination of what is good or bad based on one's standards or priorities |