Collaborative Network for Valuing Earth Information

# CALL FOR CASE STUDIES ASSESSING DIVERSE VALUES OF INFORMATION

## THE CHALLENGE

The use of Earth Science Information (ESI) including satellite-based Earth Observations (EO) is increasing across diverse contexts from agriculture to disaster response. Yet we often do not measure or fully appreciate how the use of ESI has led to tangible changes in the real world, such as changes in adaptive behavior, awareness and appreciation for a place or phenomena, deliberative democracy of the commons, and myriad other ways. Assessments of the role ESI has played in society are still limited in scope, primarily focusing on the economic benefits people gain from using ESI, such as reduced crop losses from using drought predictions or reduced health impacts from early warning systems for harmful algal blooms. But people value the availability of ESI for many other reasons. These can include increased feelings of safety or security from reducing uncertainty, stronger relationships with a place due to increased awareness about it, or greater power or representation in a decision-making process as a result of being informed about an issue.

## ABOUT CONVEI

The Collaborative Network for Valuing Earth Information, CONVEI, is a five-year program that aims to improve understanding and awareness of the values of ESI in decision-making by **advancing the assessment methods and knowledge base** of the diverse societal benefits of this information and by **enhancing the capacity of a diverse and inclusive community** of Earth scientists and social scientists to conduct such assessments. CONVEI is a collaborative program of NASA, NOAA, and USGS, led by the World Wildlife Fund. Through this work, CONVEI seeks to advance understanding of the full range of societal benefits of ESI, when and how it has the greatest benefits, and how to continue to improve its relevance to researchers, practitioners, policymakers, and society.

## REQUEST FOR PROPOSALS

CONVEI is soliciting a cohort of one-year projects that will develop case studies for valuing ESI, through the application of different types of assessment methods in different decision contexts. This will be supported either through small grants made to your institutions or through fellowships supported by WWF as the lead institution. This call for cases seeks to diversify the types of values assessed, expand the set of methods for valuing information, and reflect the complexity of decisions made using ESI. The case studies will demonstrate the uses of ESI in decision support and will build the knowledge base for further understanding the range of the values of ESI. Cases will also inform a valuation guide that will help build capacity across the Earth science and evaluation communities. Cases will be summarized and made widely accessible through CONVEI's case study library to showcase the wide range of the values that EO and ESI can provide to communities, as well as the different valuation methods for assessing these values.

## FOCUS AREAS

The focus of the case studies will be on the values that ESI provides to people answering a question or making a decision, recognizing that the process of translating information to societal value is complex. CONVEI will prioritize its selection of proposals for cases that represent:

- a range of assessment methods for evaluating the value of ESI (both quantitative and qualitative)
- an array of societal values and metrics (e.g., monetary, health, equity, subjective well-being, cultural values, etc.)
- diverse contexts for the use of ESI (e.g., in the context of disasters, climate adaptation, resource stability, poverty, environmental justice, etc.)
- the complex factors that influence how ESI data is turned into actionable information and decisions by different actors, particularly by underserved/underrepresented actors.

Despite the diverse applications of ESI, current assessment approaches commonly focus on a narrow set of societal benefits derived in a few application contexts. Past assessments (compiled in the Earth Observations Societal Benefits Repository, https://doi.sciencebase.gov/hd/#/geo-value[1]) have quantified the monetary value of ESI using methods such as benefit costs analysis and stated preference methods in agriculture, forestry, weather, climate contexts, in particular. Assessment methods related to topics such as health, poverty, and environmental justice are not well represented; neither are values beyond economic values. Additionally, advances in methodologies are needed to represent the complexity of how individual data sources are combined with other types of information in collections of systems, software, tools, models, and services that turn raw data into meaningful ESI. In this funding call, we encourage applications for case studies that diversify the existing knowledge base for the valuation of ESI.

## ELIGIBILITY CRITERIA

Applicants must meet **all** of the following eligibility criteria to be considered for a grant. These eligibility criteria are subject to change at WWF's sole discretion:

- Applications must be submitted on behalf of an entity located within the United States.
- Selected applicants must attend a 2-day kickoff meeting in Washington, D.C., scheduled for October 29-30, 2024.
- Successful applicants are responsible for submitting and acquiring IRB approvals, as appropriate. Proof of approval is required before work commences.

## APPLICATION PROCESS

The call for cases will close on June 17, 2024 at 11:59 PM US Eastern Time. An overview of the timeline is below:

- June 17, 2024: Deadline for submissions of applications at https://forms.office.com/r/txPMmVKJff.

[1] Please note: The Earth Observations Societal Benefits Repository is currently undergoing final revisions and updates. While not yet in its final form, it is fully functional and can be shared and used.

- July 2024: Selection Process. Successful applicants informed.
- August - September 2024: Grants issued or fellows interviewed and selected.
- October 29-30, 2024: In person kick-off summit for all co-PIs in Washington D.C.,
- August 2025: Case studies complete, awardees attend CONVEI summit for awardees and broader community. Specific end date depends on contract start date.

## PROPOSAL SPECIFICATIONS

- Proposals should be brief, following the word limits (provided as suggested maximum lengths) for each section in the template below.
- Timeline: all activities should occur within 12 months from the start date, with case proposals shared with other awardees by October 2024, as part of a workshop to create and beta test a preliminary version of a valuation guide. Case findings shared by August 2025 at a community summit.
- Potential funding: $100,000-$125,000 per assessment
  OR
  Support for a fellow for one year. If you're planning to hire a postdoc to do this work, we offer an option to host this position at WWF to defray administrative costs and accelerate the timing. If you are interested in exploring this option if selected, please indicate so in the budget section of the proposal.
- **APPLY AT [https://forms.office.com/r/txPMmVKJff](https://forms.office.com/r/txPMmVKJff)**

## PROPOSAL TEMPLATE AND JUDGING RUBRIC

| **PROPOSAL ELEMENT** | **WORD LIMIT (suggested)** | **JUDGING RUBRIC** Each criterion will be assessed as fully, mostly, partly, or not addressed |
|---|---|---|
| PROJECT TITLE | | |
| The title of your project | N/A | Not judged |
| BRIEF SUMMARY OF USER VALUE(S) BEING ASSESSED | | |
| Briefly describe the users whose value(s) you are assessing, and which value(s) for Earth observations or Earth science information that they hold are you assessing. | Up to 50 | Users and the specific value(s) they hold for EO or ESI have clearly been identified. Preference for users in, representing, or making decisions related to underrepresented and marginalized communities. |
| BRIEF SUMMARY OF METHODOLOGY PROPOSED FOR ASSESSING VALUE(S) | | |
| Briefly describe the method(s) being proposed for assessing the focal value(s), and justify the legitimacy of the method(s). | Up to 75 | The proposed method is clearly stated. A brief assessment of the current level of use of that method is included. |

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|---|---|---|
| Also briefly state whether the method is new or currently used for EO or ESI value of information assessment. | | |
| CASE CONTEXT | | |
| Describe the context for the proposed assessment case. Describe the decision maker(s) or user(s), the decision they face and the EO or ESI they are using. Include a description of any engagement you have already had with the decision-maker or users that motivates the case. | Up to 200 | There is a user or decision maker that has been identified and engaged. The user or decision maker has identified a clear need for EO or ESI. The decision or use they have for the EO or ESI is clearly described. |
| PROPOSED VALUE ASSESSMENT | | |
| Describe the research design and planned methodology for assessing the impact of the specific EO/ESI on specific user value(s). Include a description of how those holding the assessed value(s) will be engaged. | Up to 500 | The research design and methodology are appropriate for the use case described. The research design is robust and follows general best practices for the proposed methodology. The engagement process described has characteristics of co-production or community-led research. The proposed design is reasonable for a 12-month time frame. |
| NOVELTY | | |
| Describe why the proposed assessment is novel, and how it advances the understanding of the value of EO or ESI (e.g. economic valuation method used in a new context; established valuation approach from another field applied to EO for the first time, etc); and/or how it characterizes the complex factors that influence how ESI data is turned into actionable information and decisions by different actors. | Up to 300 | The novelty of the proposed case is clear and can be understood by a non-expert in the method that will be applied. The rationale for why the proposed advance will add value to the field of ESI assessment is clear. |
| BROADER APPLICABILITY OF ASSESSMENT METHOD | | |
| Describe how you see the method being applied in this case as more broadly relevant to other Earth observation contexts. In what other kinds of contexts would this method be relevant? Are these other contexts rare or widespread? | Up to 200 | The applicability of the advance to other cases and contexts is clear. There is clear potential for the method to be more widely used in the ESI assessment community. |

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| PROJECT TEAM | | |
| Describe the team and why they are well suited to conduct the proposed work. | Up to 300 | Team composition is well-matched to proposed work. |
| TIMELINE | | |
| Describe the major activities and key deliverables that this funding will support over the term of the award. Include a timeline for key activities and expected deliverables. | Up to 250 | The work plan clearly describes what specific work will result from this funding and how it is matched to expected deliverables. The timeline is well matched to expected impacts, budget and team. If the case is part of a broader research effort, the specific activities that this grant will support are identified. |
| BUDGET | | |
| Two options:<br>1) If seeking a grant made to your institution: Provide a budget for labor, materials, travel, and any other expenses can be included in any format, with a budget narrative. *Budget must include the cost for PIs to attend workshops in DC.*<br>2) If seeking a fellow supported by WWF: no budget is required but if additional expenses are anticipated, a narrative with justification can be included for consideration. At minimum, a list of attendees for the awardee workshop is needed. | Up to 200 | This does not have to be a formal budget, But include enough information to assess whether the budget is reasonable for the work described, including for travel to project meetings in 2024 and 2025. |
| WORKS CITED | | |
| Insert a list of works cited in the proposal | N/A | While this element will not be evaluated on its own, it will be considered as support for the elements above. |

## Annex for CONVEI Call for Case Studies

This annex provides more detail on the range of methods, values, and decision-making contexts we are looking for in the initial CONVEI call for case studies. We identify some of the methods commonly used to assess the value of information. We also identify other fields that provide relevant frameworks for valuing information that could be applied to valuing Earth Science Information. We provide several relevant value frameworks from several disciplines to give a sense of the breadth of values we are interested in representing. None of these lists are intended to be comprehensive, but rather illustrate the wide diversity of values and approaches that could be appropriate for these assessments.

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### Methods

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*Common methods used in valuing information. Many of these methods can be used in combination and with other methods, such as benefit-cost analysis, value of information analysis, value chain analysis, market analysis, and others to conduct assessments.*

- **Stated preference**: techniques used to understand individuals' preferences and values through direct inquiry, typically using surveys or interviews, and sometimes in response to hypothetical scenarios. Stated preference methods include approaches that elicit values in both monetary and non-monetary terms. Methods include contingent valuation, willingness to pay, choice experiments, and other forms of surveys, interviews and focus groups. For example, a willingness-to-pay approach, which aims to produce monetary values, might employ a question such as "how much more would you be willing to pay for this (high information) dataset versus this (low information) dataset?" An approach that aims to understand relational values in non-monetary terms, for example, might employ questions that ask about the ways in which, or how much, information might impact relational values.
- **Revealed preference**: Techniques used to infer individuals' preferences and behavior based on their observed choices. Monetary revealed preference methods focus on marketplace behaviors, and include hedonic pricing, travel cost method, consumer surplus analysis and discrete choice models. Non-monetary revealed preference methods address behaviors outside the marketplace, and include observations of behavior (e.g., attendance at events, volunteering, ceremonies) and analysis of existing materials (e.g., documents, narratives, artwork, photos posted to social media). Non-monetary methods can involve both quantitative and qualitative data.
- **Expert elicitation**: Survey technique that synthesizes opinions of multiple authorities in a particular field. For example, fire management experts may be surveyed on their beliefs about the degree to which a new data product would reduce uncertainty in predicting fire hazards and result in improved fire response outcomes. (This is in some ways a specific form of stated preference.)

*Other fields and ways of knowing relevant to assessing values:*

- Indigenous Knowledge
- Behavioral psychology
- Cultural anthropology
- Environmental learning
- Social justice
- Philosophy
- Data science (paired with social science field(s))

## Values

*Welfare economics framework:*

- **Health**: the state of physical, mental, and emotional well-being of an individual or population.
- **Amenity value**: non-market value or utility that individuals derive from the characteristics or features of their environment that contribute to their well-being and quality of life. These characteristics can include natural landscapes, recreational areas, cultural landmarks, clean air and water, and other attributes that enhance the desirability and attractiveness of a location.
- **Goods and services**: tangible or intangible products that individuals consume to satisfy their needs and wants, thereby contributing to their well-being or utility. Goods are tangible items that people consume or use to satisfy their needs and desires. Services are intangible activities or benefits that are provided to consumers to fulfill specific needs or desires.
- **Leisure**: the discretionary time individuals have available for activities that are not related to work, obligations, or necessities. It encompasses activities pursued for relaxation, enjoyment, and personal fulfillment, such as hobbies, recreation, entertainment, and socializing.
- **Non-use values**: the value that individuals place on environmental resources or amenities even if they do not directly use or interact with them. These often include existence, bequest and option values.
- **Culturally valued experiences**: the subjective experiences, activities, or aspects of culture that individuals or communities hold in high esteem and consider important for their well-being and quality of life. These may include values held for cultural festivals, artistic expressions, heritage sites, cultural practices or rituals, or culinary traditions, among others.

*Justice framework:*

- **Distributive justice**: achievement of an equitable spread within and among people or communities of any of the other values described here, including economic costs and benefits, and environmental amenities and hazards. This distribution can also refer to the equitable spread between current and future generations, conceptualized as intergenerational equity.
- **Procedural justice**: fairness, legitimacy, inclusivity and transparency of the decision-making process, particularly important for empowering marginalized individuals and groups.
- **Recognitional justice**: achievement of meaningful inclusion of diverse worldviews, cultural identities, practices, and knowledge.

*Relational values framework:*

Some ESI may have relational value – that is, values (e.g., preferences, principles) associated with relationships, especially between people and nature. Though the relational value framework has not previously been applied to information, there is much potential for ESI to provide or foster relational value(s). Common relational values are:

- **Aesthetic**: related to beauty; power of a place or non-human entity to elicit pleasure due to its beauty.

- **Care**: responsibility to act to meet the needs of particular others, human or non-human (e.g., of a place); stresses importance of emotions and empathy in that responsibility.
- **Identity**: sense of "who we are" or "who I am".
- **Interconnectedness**: multi-directional connectedness between people and nature, or between people as mediated by nature.
- **Kinship**: familial ties between people and nature or elements of nature.
- **Place links**: value of meaningful relationship with place; includes sense of place and connectedness to place.
- **Reciprocity**: mutual, often repeated or cyclical, give-and-take between people and nature, or between people as mediated by nature.
- **Responsibility**: duty and accountability to a place or non-human entity.
- **Sacredness**: spiritually important; holy; often implies deserving of veneration.
- **Stewardship**: wise, responsible use of natural resources; less inherently reciprocal than care.

*Social cohesion framework*:
Social cohesion refers to the social bonds between people, the quality of these bonds, and outcomes of social interactions, including both subjective and objective components such as attitudes and norms and collective actions. There are many approaches and operationalizations used to measure social cohesion here we highlight some of the most common dimensions.

- **Social relations**: social networks between people include both the number of connections between people and the quality of the social connections. Includes participation (political as well as sociocultural/civic); trust (person's belief that another individual, social networks or institutions behaviors are predictable and is led by positive intentions); acceptance of diversity.
- **Identification/belonging**: the emotional and psychological connection or connectedness between individuals towards their community, region, country, or other social entity.
- **Orientation towards the common good**: relates to solidarity and responsibility for others, respect for and adherence to social rules.
- **Shared norms and values**: Common beliefs, moral principles, expectations or beliefs that guide individual behavior. This concept may be excluded from definitions of social cohesion as it may be an enabling factor or the results of social cohesion.

## Decision-making contexts

CONVEI is interested in the values of information to collective or individual decision-making, at any and all stages of formal (structured) or informal decision-making processes. In a structured decision making context (see Figure 1), these stages can be understood as: identifying the problem/opportunity, defining the objectives, developing alternatives, estimating consequences, evaluating the tradeoffs, and implementing, monitoring and learning (which leads to the identification of new problems/opportunities). Decision-making could include a single decision or a set of decisions that are made repeatedly. The actors could include any individuals or groups within the public sector, private sector, or civil society, but we are especially interested in cases that include consideration of disadvantaged communities or other underrepresented or underserved groups.

The contexts could include any societal challenges or opportunities, including:

- Environmental and/or social justice
- Conservation
- Climate resilience
- Disasters
- Agriculture
- Water resources
- Health

**Figure 1.** Structured decision-making framework, describing the steps of a formal decision-making process (although informal, individual decision-making may also follow many of these steps). Source: IPBES Policy Support Tools.