



Preserving Legacies Guiding Principles and Framework for Assessing Climate Risk



© Main Copyright

Preserving Legacies
ICOMOS

Published under a Creative Commons license.



Suggested citation:

Sabour, S., Megarry, W., Forgesson, S., Paterno, T., Potts, A., Soares Silva J.P., Ronsin-Quechon, D., Bouaziz, K., Polanco, J., Snyder, M., Carpio, E. and Herrmann, V. 2024. *The Preserving Legacies Guiding Principles and Framework for Assessing Climate Change Risk to Heritage Places*. Paris: ICOMOS and Preserving Legacies

ISBN: 978-2-487082-10-6

This publication may be reproduced in whole or in part and in any form for educational or non-profit services without special permission from the copyright holder, provided acknowledgement of the source is made. Representatives acknowledged here would appreciate being informed of any publication that uses this publication as a source.



Summary for Heritage Practitioners

The heritage sector has developed a wide range of tools to assess risk and vulnerability in recent years. The Preserving Legacies framework is similar to many of these; however, it also diverges in key areas. Specifically, it takes a **broad values-based approach** which understands that assessing climate risk to heritage values can be a different (but related) question to assessing risk to heritage fabric/attributes. It does not assume or place a hierarchy on these values or assume that existing inventories represent a complete picture of a community's heritage. Rather, it is **community-led**, working with partners to define key areas of concern. It also takes a **broader spatial approach** acknowledging that climate impacts are not restricted to prescribed site boundaries. While great value is placed on downscaled climate models, the Preserving Legacies Framework places equal value on **plural knowledge systems** which it incorporates broadly across its understanding of hazards, vulnerabilities, exposures and responses. The Preserving Legacies Framework is **locally led and facilitated** by project colleagues and partners who are implementing the framework following intensive training and knowledge exchange within the project, backed by a global Community of Practice, leading to targeted, sustainable and locally appropriate adaptation actions. These actions, coupled with inspiring storytelling, aim to join up to broader adaptation efforts and inspire more ambitious climate action.

Summary for Climate Scientists

Climate science has significantly advanced methodologies for evaluating risks and impacts, prominently featuring the IPCC's risk framework. The Preserving Legacies framework builds on this foundation. It uniquely incorporates the **societal and cultural dimensions** of climate risks, recognising the significant role of **cultural systems** in contributing to and mitigating risks. This is achieved through a community-led climate risk assessment process that begins with a comprehensive mapping of not only the physical and tangible attributes of heritage places but also their values and intangible dimensions. It emphasises the **ethical and equitable involvement of stakeholders and rights-holders** in all stages of risk assessment. Central to this approach is the **empowerment of community leaders** through training in climate and risk literacy. This bridges the gap between communities and professionals with local climate and heritage leaders facilitating vital exchanges. This holistic assessment extends to the integration and validation of **plural knowledge systems**, employing both qualitative and quantitative data to thoroughly evaluate the key determinants of risk, namely hazards, exposures, vulnerabilities, and responses. It is a **culturally flexible framework** that can be adapted to different cultural contexts. Through this multifaceted approach, the framework enriches the understanding of climate risks while fostering more inclusive and effective strategies for climate adaptation and heritage conservation.



What are the Preserving Legacies Guiding Principles and Framework for Assessing Climate Risk?

Preserving Legacies envisions a world where empowered communities lead risk assessments and adaptation planning for their places of cultural significance to safeguard their heritage values and communities against current and projected impacts of climate change. These local efforts connect to national and global climate policies, and each heritage place and community's stories and experiences inspire care for culture and climate action around the world.

Climate change affects us all, but each heritage place faces distinct challenges. Preserving Legacies recognizes that every heritage place has its unique culture, exposure to climatic hazards, and vulnerability, including its sensitivity to harm and capacity to cope and adapt. Our approach for assessing risk and impacts, therefore, must vary, as each custodian customises and localises the work for the highest acceptance and engagement by their communities for their own site.

Preserving Legacies equips custodians with cutting-edge scientific knowledge and technical training in climate and risk literacy, providing them with the building blocks to become the architects of their own localised and culturally relevant, community-led climate change risk assessment and adaptation planning. By forging strategic and right alliances with institutions and individuals who share this vision of equity and climate justice, we can scale the work in addressing the most pressing needs of communities and countries worldwide.

Success for the Preserving Legacies Framework is multi-faceted and encompasses a broad range of outcomes:

Locally-Led Adaptation

Success is seen in the active engagement and leadership of custodians and/or local communities and entities in identifying and prioritising heritage values, associated concerns and subsequent climate action. This community-led approach ensures that the framework reflects and respects the diverse values and needs of the people it serves.

Adaptive and Inclusive Actions Based on Plural Knowledge Systems

The implementation of targeted, sustainable, and locally appropriate adaptation actions signifies success. These actions validate and are informed by plural knowledge systems, (including scientific data, local knowledge, and traditional practices), developed through intensive training and knowledge exchange and a thorough understanding of community and economic concerns.

Broad Spatial Considerations

Success involves the framework's ability to address the impact of climate change on a heritage place and associated broader communities. This means taking into account broader spatial contexts by extending beyond traditional site boundaries. This ensures a comprehensive approach to heritage preservation that acknowledges the interconnectedness of environmental and cultural landscapes.



Sustainable Outcomes

The long-term sustainability of adaptation actions and their positive impact on both heritage sites and community resilience are key indicators of success. The framework's success is measured by its ability to foster lasting benefits for heritage preservation and community well-being.

Collaborative Partnerships

Success is defined by the strength and effectiveness of partnerships formed during the project. Collaborative efforts among local communities, project colleagues and partners, government institutions, civil society, academia, climate science and action groups, and other partners, and any who might possibly further the work that was begun here.

Resilience Strengthening

Ultimately, success is reflected in the strengthened resilience of communities that care for and are associated with heritage places. The framework's comprehensive, values-based approach ensures that heritage preservation contributes to broader efforts in building adaptive and resilient communities, regions and nations.



Guiding Principles

Preserving Legacies advocates for a **values-based and community-led methodology** which embraces diverse knowledge systems to understand climate change risk and impacts, both present and future, on heritage places. It understands risk as a dynamic intersection of the four determinants of risk: hazards, vulnerabilities, exposures and responses. As such, it aligns with the IPCC framework as outlined in the 2023 AR6 report (Figure 1).

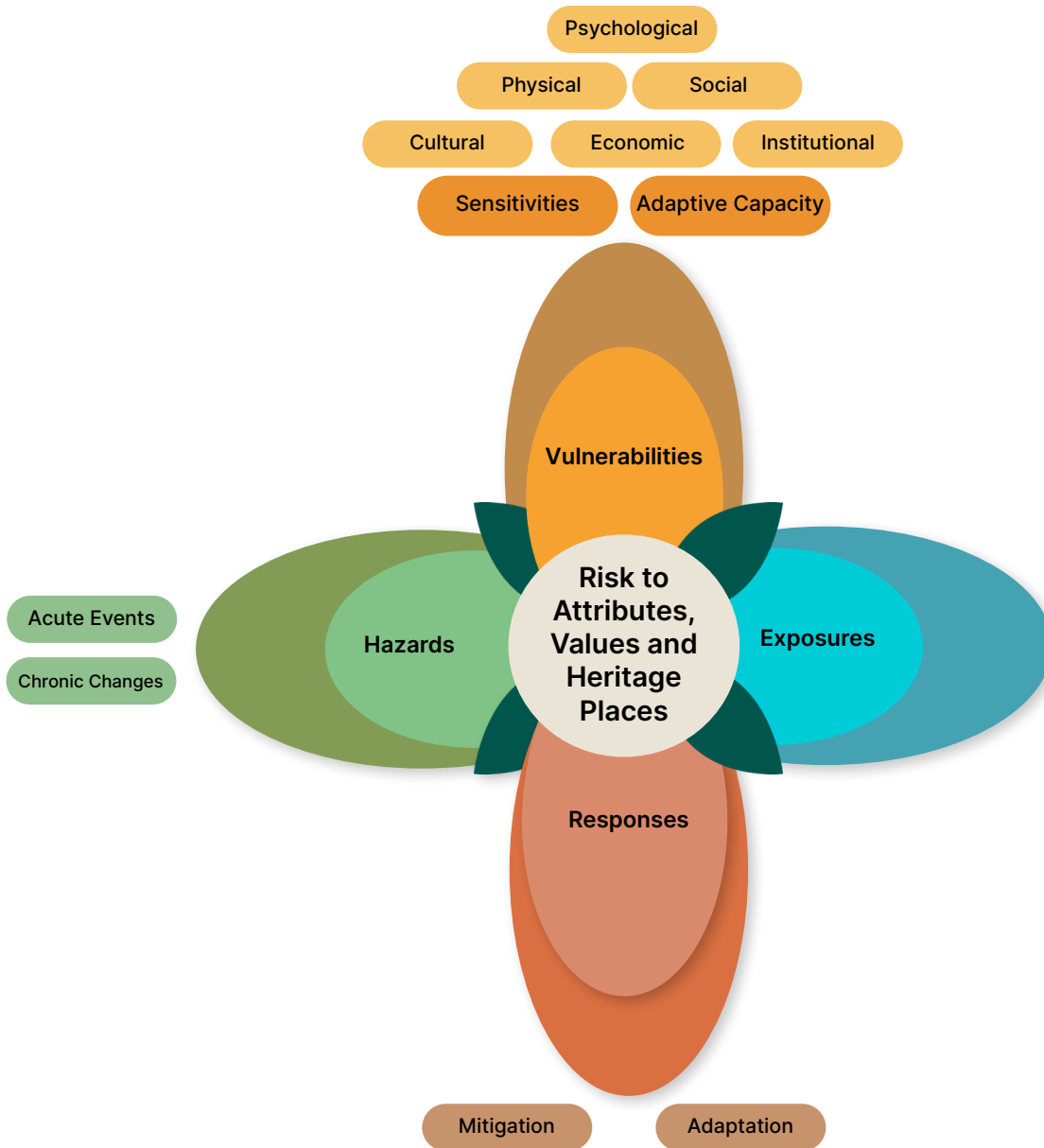


Figure 1: The Preserving Legacies climate risk flower conceptualises risk assessment, with each petal representing a key determinant: hazards, vulnerabilities, exposures, and responses (adapted from Simpson *et al.*, 2021 and Ayanlade *et al.*, 2023)



The Preserving Legacies methodology does not promote a single approach or tool. Rather, it advocates for locally led strategies that embrace key guiding principles aligned with the IPCC risk assessment framework.

Specifically:

- It embraces a **values-led approach to conservation** as outlined in the ICOMOS Australia Burra Charter, which stresses that the conservation of heritage places should take into account all aspects of their significance while also acknowledging the range of differing and sometimes conflicting values present. It promotes the broad inclusion of different stakeholders and rights holders in identifying these values and their associated attributes (Figure 2).
- It promotes the importance of engagement with climate science and techniques to understand how climates will change in the future and how the values of heritage places may be impacted by current and future **climatic changes**.
- To understand the possibility of harmful impacts of climate change to heritage places and the effects of these impacts on broader communities (risk), it adopts a risk assessment methodology focused on existing and projected **climate hazards** which are climatic events that may cause disruption or damage.
- For each hazard, the methodology also explores other factors which contribute to risk, including
 - ◊ the presence of people or things which may be affected by the hazard (**exposures**),
 - ◊ their predisposition to be impacted by the hazard (**vulnerabilities**),
 - ◊ and any measures taken that could reduce or increase the risk (adaptive and maladaptive **responses**).
- It believes that effective climate risk assessment requires an inclusive, **locally-led, organised and facilitated multi-disciplinary approach** that brings together local communities, professionals, stakeholders, rights holders, climate scientists, environmental and cultural heritage experts, and policymakers through open discussions. This collaborative approach can yield a more comprehensive understanding of climate risks and facilitates the development of robust mitigation and adaptation strategies. It can be achieved through the use of open and inclusive approaches, including culturally appropriate focus groups or workshops.
- It understands that the **exposures** (the presence of people or things which may be affected) and **vulnerabilities** (predisposition to be impacted by the hazard) of heritage places are key to understanding climate risk. These can change or manifest over time and may differ for different values and their attributes. It believes that local stakeholders and heritage professionals are often best placed to assess the exposure and vulnerability of different values to climate hazards.
- The methodology acknowledges that the predisposition to be impacted by hazards of heritage places and communities (vulnerability) is **systemic** in nature, encompassing interconnected physical, social, economic, institutional, cultural and psychological elements that heighten vulnerability over time. For instance, frontline communities may have been displaced from their traditional lands and denied access to resources critical for maintaining cultural practices and traditional knowledge systems. This social injustice and loss of connection to place makes their cultural heritage intrinsically more vulnerable.



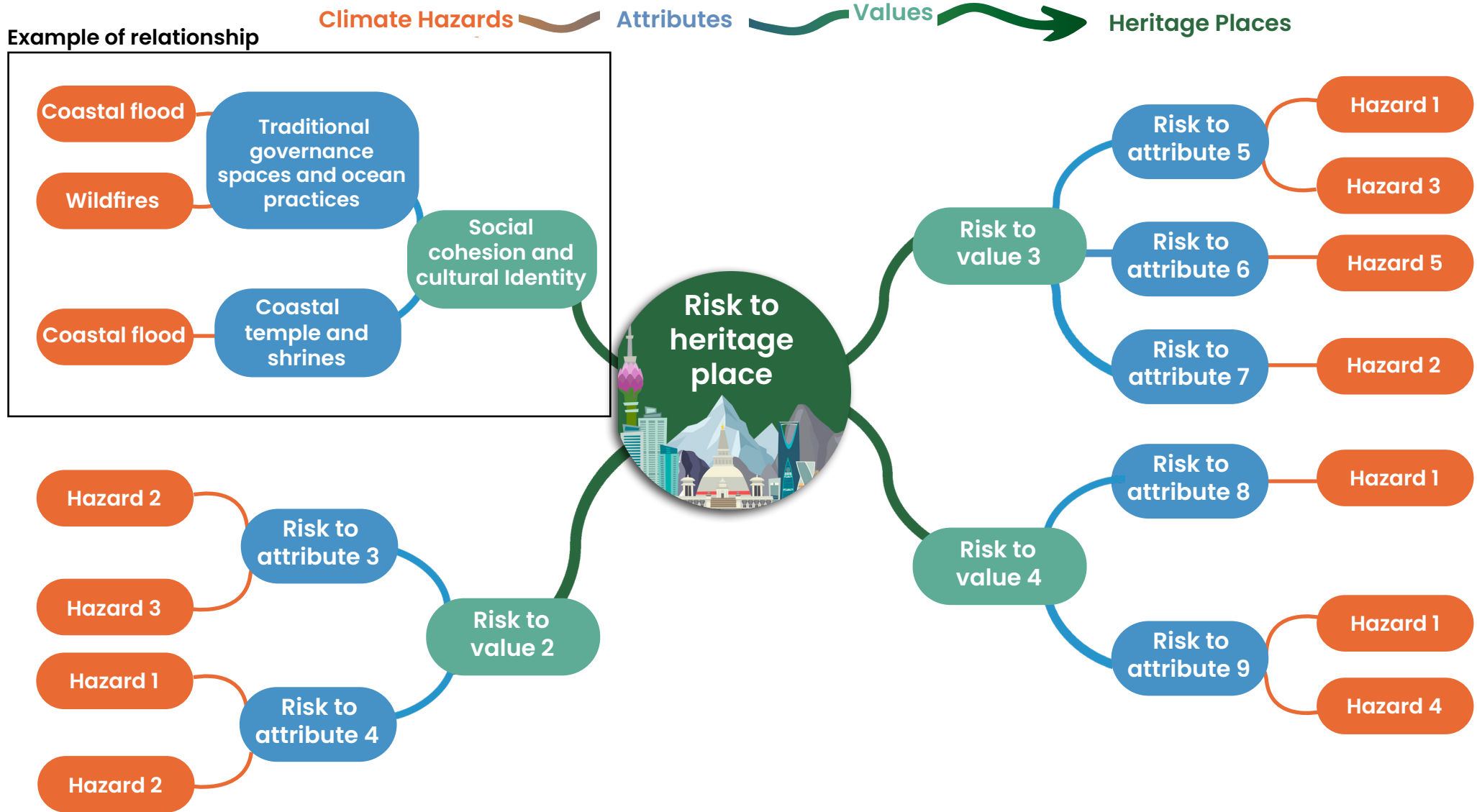


Figure 2: Risk assessment for a heritage place involves a systematic process that begins with identifying and mapping stakeholders, rights holders, and the site's values. This initial step ensures that all relevant parties and the heritage's intrinsic values are considered. Following this, the specific hazards impacting the heritage place are identified. Once these hazards are validated, their potential risks to the site's attributes are evaluated. This evaluation is then interpreted to assess the risk to the site's heritage values posed by these hazards. This framework enables a comprehensive exploration of risk, allowing for analysis the risk from a specific hazard to multiple attributes and values of the heritage place or the complex risk from multiple hazards on a particular value or the heritage place as a whole. The identification of hazards, attributes, and values, as well as the evaluation of risks, is conducted through a locally-led equitable and just engagement process with stakeholders and rights holders, ensuring inclusivity and fairness in the assessment.

- Vulnerability is the **balance** between **susceptibility to harm**, which are the inherent sensitivities that make a system more prone to damage, and **adaptive capacity**, which are the underlying strengths and resources that enable a system to manage and mitigate the impacts of hazards.
 - ◊ Susceptibility to harm encompasses various dimensions of vulnerability, including physical and environmental, social, economic, political, cultural and psychological. **Physical and environmental vulnerability** refers to the inherent susceptibility of materials, structures, or landscapes due to their physical properties and construction methods, making them prone to temperature and humidity changes, flooding, erosion, and extreme weather, especially in coastal or low-lying areas. **Social vulnerability** includes social, economic, political, and cultural factors that increase susceptibility, such as underdevelopment, poor planning, conflicts, lack of community awareness about climate risks, and the loss of traditional knowledge and practices. Many of these are the result of historical inequalities and extractive forces, of which includes the continual perpetuation of, and repercussions from, colonialism. **Economic vulnerability** is exacerbated by conditions such as poverty, dependence on climate-sensitive tourism, and the lack of resources for maintenance and protection. **Political and institutional vulnerability** arises from political instability or poor governance, inadequate policies and regulations, and the absence of climate change considerations in management plans. **Cultural and psychological vulnerability** stemming from the loss of traditional knowledge, land alienation and disconnect, and disruption of community identity, can compound the climate risks faced by heritage places and communities.
 - ◊ Adaptive capacity encompasses multiple dimensions that contribute to a system's ability to withstand, recover from, and adapt to impacts. It involves the **availability, effectiveness and resilience of physical resources, infrastructure, and ecosystems**, including resilient traditional construction techniques, implementation of physical adaptation measures like flood defences, ongoing maintenance and conservation efforts, and resilient natural features such as mangrove communities. **Social aspects** of adaptive capacity include strong social networks, community engagement, preservation of local and Indigenous knowledge, and diverse livelihood assets. **Economic factors** play a crucial role, with diversified funding streams and the integration of heritage in sustainable development plans enhancing resilience. **Institutional components** are equally important, featuring flexible management plans that consider climate impacts, supportive policy frameworks, and access to funding for adaptation measures.
- The methodology emphasises the need to holistically identify, assess and address these multi-dimensional vulnerabilities. These are dynamic and can change over time due to human decision making or wider socio-economic changes. Again, it believes that those most familiar with heritage sites and their communities are often best placed to identify and gauge how these vulnerabilities manifest and their impacts.
- It embraces climate action **response** and culture, including any adjustments to present or future climate effects (adaptation) and efforts to reduce or capture greenhouse gas emission (mitigation), as key factors in reducing climate risk. These may include existing climate adaptation actions which utilise past practices, nature-based solutions and contemporary adaptation interventions. It also acknowledges that responses can lead to maladaptive efforts and actions that can unintentionally increase risk.
- It acknowledges the equal importance of plural knowledge systems, including Indigenous Knowledge, scientific knowledge (including its communication), and local knowledge (including learning from the past) in understanding, integrating and validating what are the hazards, exposures, vulnerabilities and responses (Figure 3).
- It acknowledges that when assessing **future** hazards, vulnerabilities, exposures, and responses, their **magnitude** (the severity or extent) and **likelihood** (the probability or chance of occurring) must be considered.
- It acknowledges that risk is **complex** because it arises from the combination of hazards, vulnerabilities, exposure, and responses. Many different factors within each of these components can make

the risk worse or better. Furthermore, risks don't occur in isolation - they can interact and build upon each other, creating new or more severe risks.

- It distinguishes between risks and impacts: impacts are the actual effects or consequences that occur when a **risk is realised and affects** a heritage site, altering both its state of conservation and its ability to convey its heritage values; it is possible to have a low-risk scenario resulting in high impacts, such as an earthquake causing significant damage to a fragile historic structure, or a high-risk situation leading to low impacts, like a severe storm with minimal effects on a well-preserved and resilient cultural landscape.
- It acknowledges the importance of enhancing climate literacy and co-creating methodologies and approaches to communicate climate science and data effectively, and also of connecting heritage advocates to broader local, regional, national and international climate adaptation planning, policy, and finance.
- It acknowledges that for some heritage places, in situ conservation (as that traditionally been understood) may not be possible under currently projected emissions scenarios and accordingly heritage safeguarding must include attention to reducing greenhouse gas emissions within a framework of common but differentiated responsibilities, while also helping communities reconceptualize what heritage safeguarding means and preparing for loss and damage.



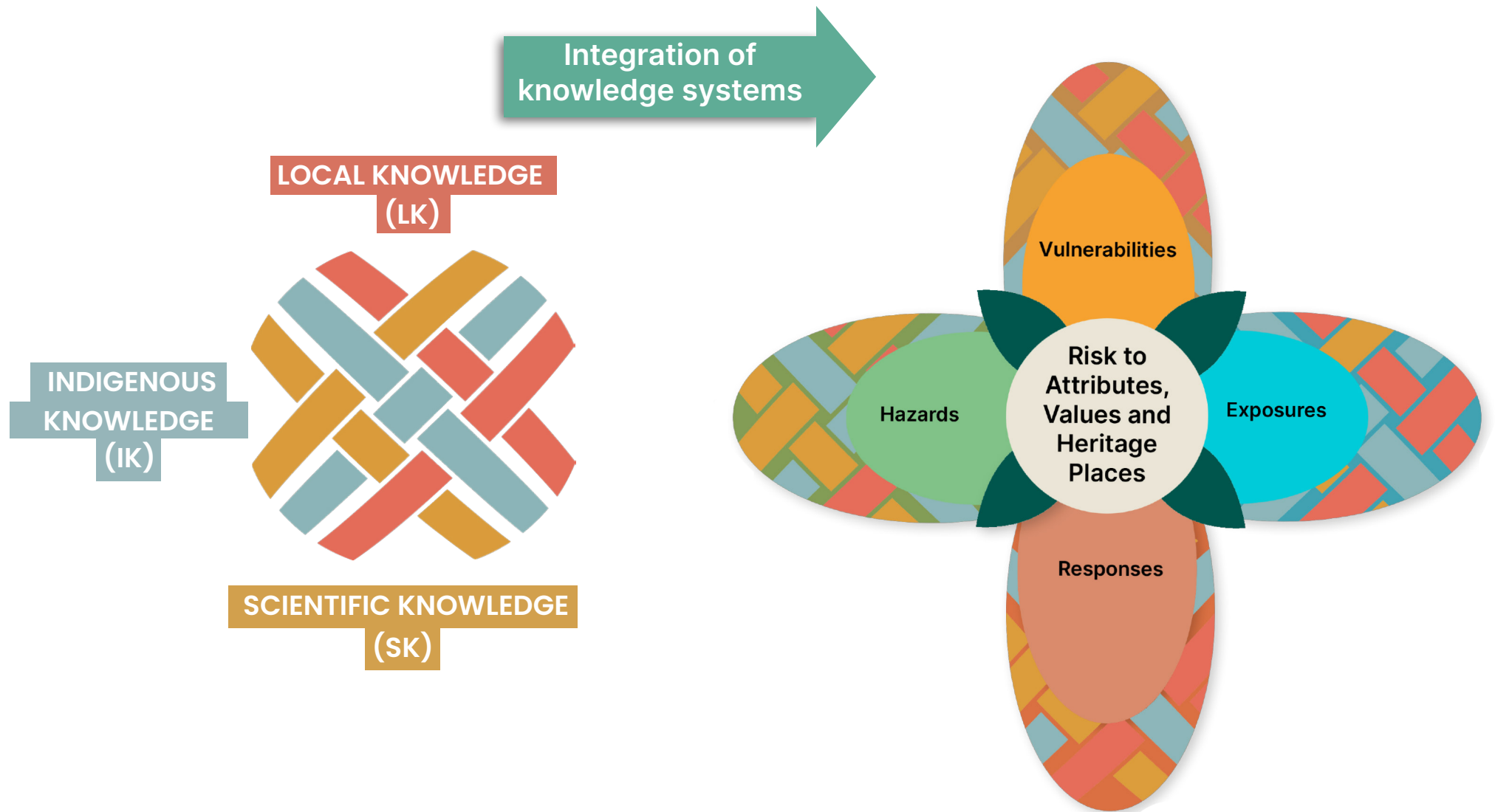


Figure 3: Illustration of the risk assessment process guided by the Preserving Legacies Principles necessitates integrating three knowledge systems: Indigenous Knowledge, Local Knowledge, and Scientific Knowledge. This integration is applied to each component of the climate risk flower, encompassing hazards, vulnerabilities, exposures, and responses. The process ensures that the integration of these knowledge systems is both equitable and just, recognising and valuing all elements that define a knowledge system. This includes the knowledge providers, the structural and dynamic processes involved, and the content itself.

Glossary:

Values: Values refer to the specific attributes, characteristics, or qualities of a site that particular stakeholder groups deem important or significant. Values associated with heritage sites encompass a wide range of categories, reflecting the diverse significance and importance they hold. These categories include historical, cultural, recreational, biological diversity, aesthetic, educational, scientific, economic, spiritual, philosophical, political, therapeutic, and health-related values. This comprehensive list highlights the multifaceted nature of heritage sites and the various ways in which they can be appreciated and valued by different individuals and communities.

Attributes: Attributes are aspects of a property which are associated with or express the site's values (for World Heritage Sites their Outstanding Universal Value). Attributes can be tangible, intangible or process based. Attributes can be physical qualities or fabric, or the relationships between them. Attributes can also be processes impacting on physical qualities, such as natural or agricultural processes, social arrangements or cultural practices that have shaped distinctive landscapes. For natural properties, they can include landscape features, habitats, aspects of environmental quality (such as intactness, high/pristine environmental quality), scale and naturalness of habitats, and size and viability of wildlife populations.

Hazard: The potential occurrence of a natural or human-induced physical event or trend that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources (IPCC, 2021; IPCC, 2022a; IPCC, 2022b).

Exposure: The presence of people; livelihoods; species or ecosystems; environmental functions, services, and resources; infrastructure; or economic, social, or cultural assets in places and settings that could be adversely affected (IPCC, 2021; IPCC, 2022a; IPCC, 2022b).

Vulnerability: The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt. Vulnerability is then a function of sensitivity and adaptive capacity (IPCC, 2021; IPCC, 2022a; IPCC, 2022b).

Responses: Response refers to the immediate actions taken to address a situation, while adaptive capacity is the ability of a system to adjust to climate change, moderate potential damages, and cope with consequences (IPCC, 2021; IPCC, 2022a; IPCC, 2022b).

Risk: The potential for adverse consequences for human or ecological systems, recognising the diversity of values and objectives associated with such systems. In the context of climate change, risks can arise from potential impacts of climate change as well as human responses to climate change. Relevant adverse consequences include those on lives, livelihoods, health and wellbeing, economic, social and cultural assets and investments, infrastructure, services (including ecosystem services), ecosystems and species (IPCC, 2021; IPCC, 2022a; IPCC, 2022b).

The word “potential” makes clear that uncertainty, or more broadly, incomplete knowledge (as defined in IPCC), is a key element of the concept of risk. This uncertainty does not necessarily have to be quantified, but authors need to provide some sense of the nature and degree of uncertainty to allow a meaningful risk assessment and risk management responses to be undertaken (Reisinger *et al.*, 2020).

Risk in the context of climate change impacts: In the context of climate change impacts, risks result from dynamic interactions between climate-related hazards with the exposure and vulnerability of the affected human or ecological system to the hazards. Hazards, exposure and vulnerability may each be subject to uncertainty in terms of magnitude and likelihood of occurrence, and each may change over time and space due to socio-economic changes and human decision-making (see also risk management, adaptation, mitigation) IPCC, 2021; IPCC, 2022a; IPCC, 2022b).

Risk in the context of climate change responses: In the context of climate change responses, risks result from the potential for such responses not achieving the intended objective(s), or from potential trade-offs with, or negative side-effects on, other societal objectives, such as the Sustainable Development Goals (SDGs) (see also risk trade-off). Risks can arise, for example, from uncertainty in implementation, effectiveness or outcomes of climate policy, climate-related investments, technology development or adoption, and system transitions. See also Hazard and Impacts (consequences, outcomes) (IPCC, 2021; IPCC, 2022a; IPCC, 2022b).

Resilience: The capacity of interconnected social, economic and ecological systems to cope with a hazardous event, trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure. Resilience is a positive attribute when it maintains capacity for adaptation, learning and/ or transformation (Carson and Peterson, 2016; IPCC, 2021; IPCC, 2022a; IPCC, 2022b).

The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions. (UNISDR, 2009).

Impacts (consequences, outcomes): The effects or consequences of a factor on the attributes of the property, both in terms of the attributes' state of conservation and their ability to convey the heritage values. (UNESCO/ICCROM/ICOMOS/IUCN, 2023)

The consequences of realized risks on natural and human systems, where risks result from the interactions of climate-related hazards (including extreme weather/climate events), exposure, and vulnerability. Impacts generally refer to effects on lives, livelihoods, health and well-being, ecosystems and species, economic, social and cultural assets, services (including ecosystem services), and infrastructure. Impacts may be referred to as consequences or outcomes and can be adverse or beneficial (IPCC, 2021; IPCC, 2022a; IPCC, 2022b).

A direct impact results from a cause-and-effect relationship between a project and a specific attribute of World Heritage or other environmental components. Indirect impacts are impacts on the environment which are not a direct result of the project, often produced away from or as a result of a complex pathway and sometimes referred to as 'second' or 'third-level' impacts or 'secondary' impacts. A cumulative impact results from the environmental impacts of a project combined with the same environmental impacts of other past, existing or reasonably foreseeable future projects or activities, including those that may be enabled by the project. (Jo *et al.*, 2022).

Sensitivity: The degree to which a system or species is affected, either adversely or beneficially, by climate variability or change. The effect may be direct (e.g., a change in crop yield in response to a change in the mean, range, or variability of temperature) or indirect (e.g., damages caused by an increase in the frequency of coastal flooding due to sea level rise) (IPCC, 2021; IPCC, 2022a; IPCC, 2022b).

Adaptive capacity: The ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences (IPCC, 2021; IPCC, 2022a; IPCC, 2022b).

Knowledge Systems: Knowledge systems are inherently holistic, composed of many interacting constituent parts that may span or be embedded within different interrelated aspects of social practice, including economic, social, environmental, political, cultural, and spiritual dimensions. They relate to and connect both material components or tangible heritage (e.g., humans, animals/plants, landscapes, built structures, and objects, including tools), and non-material components or intangible heritage (e.g., languages, ideas, values, beliefs, epistemologies and worldviews). At the same time, knowledge systems reflect how these components interconnect with each other, blurring the boundaries between what is defined as tangible and intangible. Knowledge systems are sets of interacting 'agents, practices and institutions that organise the production, transfer and use of knowledge' (Cornell *et al.*, 2013; Orlove *et al.*, 2022).

Local knowledge: The understandings and skills developed by individuals and populations, specific to the places where they live. Local knowledge informs decision-making about fundamental aspects of life, from day-to-day activities to longer-term actions. This knowledge is a key element of the social and cultural systems which influence observations of and responses to climate change; it also informs governance decisions (UNESCO, 2018). **See also Traditional Knowledge**

Indigenous knowledge: There is no single internationally accepted definition of Indigenous peoples or Indigenous knowledge systems (Petzold *et al.*, 2020; Orlove *et al.*, 2022).

However, Indigenous knowledge systems are integral to cultural complexes, encompassing language, classification systems, resource use practices, social interactions, values, rituals, and spirituality (Cajete, 2016). While there are cultural and linguistic differences, Indigenous knowledge systems share underlying similarities in their approach to the interrelationship and development of individuals within the community (Cajete, 2016). Little Bear (2020) states that Indigenous knowledge systems are holistic, cyclical, generalist, process-oriented, and place-based. The Inuit Circumpolar Council (2021) states that Indigenous knowledge is a systematic way of thinking applied across biological, physical, cultural, and spiritual systems based on direct and long-term experiences, multi-generational observations, lessons, and skills passed on from generation to generation (Orlove *et al.*, 2022).

The understandings, skills and philosophies developed by societies with long histories of interaction with their natural surroundings. For many Indigenous peoples, IK informs decision-making about fundamental aspects of life, from day-to-day activities to longer-term actions. This knowledge is integral to cultural complexes, which also encompass language, systems of classification, resource use practices, social interactions, values, ritual and spirituality. These distinctive ways of knowing are important facets of the world's cultural diversity (UNESCO, 2018). **See also Traditional Knowledge**

Traditional Knowledge: A term used commonly to describe local and Indigenous Knowledge, this incorporates the innovations and practices of Indigenous and local communities around the world. Developed from experience gained over the centuries and adapted to the local culture and environment, traditional knowledge is transmitted orally from generation to generation. It tends to be collectively owned and takes the form of stories, songs, folklore, proverbs, cultural values, beliefs, rituals, community laws, local language and agricultural practices, including the development of plant species and animal breeds. Traditional knowledge is mainly of a practical nature, particularly in such fields as agriculture, fisheries, health, horticulture, forestry and environmental management in general (Secretariat of the Convention on Biological Diversity - SCBD, Art.8(j), 2005). **See also Local Knowledge and Indigenous Knowledge.**

Scientific Knowledge: Scientific knowledge refers to a systematic body of laws, theories, and explanations about the natural and social world that is developed through an eclectic assemblage of practices, forms of reasoning, and approaches that have evolved over time. It incorporates multiple perspectives to study complex natural and social phenomena or behaviors rather than being constrained to a single hypothetico-deductive method. Laws represent observed patterns of phenomena or behaviours, while theories provide systematic explanations of the underlying phenomena or behaviours of interest. This generalised body of knowledge is acquired using the scientific method, which employs various reasoning techniques and research practices to explain phenomena and behaviours under investigation. (Orlove *et al.*, 2022; Bhat-tacherjee, 2012).

Stakeholders: Actors who possess direct or indirect interests and concerns about heritage resources, but do not necessarily enjoy a legally or socially recognized entitlement to them (UNESCO/ICCROM/ICOMOS/IUCN, 2023)

Rights holders: Actors socially endowed with legal or customary rights with respect to heritage resources. (UNESCO/ICCROM/ICOMOS/IUCN, 2023).

Mitigation (of climate change): A human intervention to reduce emissions or enhance the sinks of greenhouse gases (IPCC, 2021; IPCC, 2022; IPCC, 2022b).

Adaptation: In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects (IPCC, 2021; IPCC, 2022a; IPCC, 2022b).

Magnitude: Magnitude reflects the scale, intensity or severity of hazard, exposure, vulnerability or impacts.

Likelihood: The chance of a specific outcome occurring, where this might be estimated probabilistically. Likelihood is expressed in this report using a standard terminology (Mastrandrea *et al.*, 2010; IPCC, 2021; IPCC, 2022a; IPCC, 2022b).



References:

Ayanlade, A., Smucker, T.A., Nyasimi, M., Sterly, H., Weldemariam, L.F. and Simpson, N.P., 2023. Complex climate change risk and emerging directions for vulnerability research in Africa. *Climate Risk Management*, 40, p.100497.

Bhattacharjee, A., 2012. *Social science research: Principles, methods, and practices*. University of South Florida.

Carson, M. and G. Peterson (eds), 2016. *Arctic Resilience Report*. Arctic Council, Stockholm Environment Institute and Stockholm Resilience Centre, Stockholm. <http://www.arctic-council.org/arr>.

Cornell, S., Berkhout, F., Tuinstra, W., Tàbara, J. D., Jäger, J., Chabay, I., de Wit, B., Langlais, R., Mills, D., Moll, P., Otto, I. M., Petersen, A., Pohl, C., & Van Kerkhoff, L. (2013). Opening Up Knowledge Systems for Better Responses to Global Environmental Change. *Environmental Science & Policy*, 28, 60–70. <https://doi.org/10.1016/j.envsci.2012.11.008>

IPCC, 2021: *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, In press, doi:10.1017/9781009157896.

IPCC, 2022a: *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926

IPCC, 2022b: *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926

Jo, E., Mackay, R., Murai, M., & Therivel, R., 2022. *Guidance and toolkit for impact assessments in a World Heritage context*. UNESCO Publishing.

Mastrandrea, M.D., C.B. Field, T.F. Stocker, O. Edenhofer, K.L. Ebi, D.J. Frame, H. Held, E. Kriegler, K.J. Mach, P.R. Matschoss, G.-K. Plattner, G.W. Yohe, and F.W. Zwiers, 2010: *Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties*. Intergovernmental Panel on Climate Change (IPCC).

Orlove, B., Dawson, N., Sherpa, P., Adelekan, I., Alangui, W., Carmona, R., Coen, D., Nelson, M., Reyes-García, V., & Rubis, J., 2022. *ICSM CHC White Paper I: Intangible cultural heritage, diverse knowledge systems and climate change. Contribution of Knowledge Systems Group I to the International Co-Sponsored Meeting on Culture, Heritage and Climate Change*. ICOMOS & ICSM CHC.

Petzold, J., Andrews, N., Ford, J. D., Hedemann, C., & Postigo, J. C., 2020. Indigenous Knowledge on Climate Change Adaptation: A Global Evidence Map of Academic Literature. *Environmental Research Letters*, 15(11), 113007. <https://doi.org/10.1088/1748-9326/abb330>

Reisinger, A., M. Garschagen, K.J. Mach, M. Pathak, E. Poloczanska, M. van Aalst, A.C. Ruane, M. Hoden, M.

Hurlber, K. Mintenbeck, R. Pedace, M. Rojas Corradi, D. Viner, C. Vera, S. Kreibiehl, B O'Neill, H.-O. Pörtner, J. Sillmann, R. Jones, and R. Ranasinghe, 2020. *The Concept of Risk in the IPCC Sixth Assessment Report: A Summary of Cross-Working Group Discussions: Guidance for IPCC Authors*. Intergovernmental Panel on Climate Change.

Secretariat of the Convention on Biological Diversity, 2005. *Handbook of the Convention on Biological Diversity Including its Cartagena Protocol on Biosafety*, 3rd edition, Montreal, Canada

Simpson, N.P., Mach, K.J., Constable, A., Hess, J., Hogarth, R., Howden, M., Lawrence, J., Lempert, R.J., Muccione, V., Mackey, B. and New, M.G., 2021. A framework for complex climate change risk assessment. *One Earth*, 4(4), pp.489-501.

UNDRR (United Nations Office for Disaster Risk Reduction), 2009. *Terminology of Disaster Risk Reduction*. https://www.preventionweb.net/files/7817_UNISDRTerminologyEnglish.pdf



Contact:

For more questions or information, please contact us through our website:

<https://www.heritageadapts.org/>



Climate Heritage
NETWORK

ICOMOS
international council on monuments and sites

Produced in partnership with the National Geographic Society