

# Scientific Tourism

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Scientific tourism (ST) is a transversal approach to tourism development and management that can be applied in the evolution of many segments, from rural, to ecotourism or mass tourism. ST focuses on contributing to the resilience of communities and territories by building shared knowledge and understanding of essential socio-ecological characteristics and dynamics.

The website of the ST network ([scientific-tourism.org](http://scientific-tourism.org)), defines ST as an activity where visitors participate in the generation and dissemination of scientific knowledge being developed by research and development centers. Mao and Bourlon described ST using a spectrum of levels and thematic approaches, organized around the four overarching categories: (1) adventure tourism with a scientific dimension, (2) cultural tourism with a scientific dimension, (3) scientific eco-volunteering, and (4) scientific research-based tourism. The authors suggested that, in many cases, the four forms of ST were complementary, and could simultaneously occur or merge within the scope of a destination or project. While this approach to ST incorporates many of the concepts of learning tourism, it differs in that it is grounded in the perspective of scientific knowledge generation and dissemination.

Scientific tourism (ST) development builds on the scientific heritage of a geography, by matching researchers with local actors in an ongoing process that leads to shared understanding and the creation of new knowledge that can support the conservation and resilience of communities and their natural and socio-cultural settings. Through purposeful grounding of tourism in science, local communities can become more engaged with the socio-ecological systems in which they live and become empowered to innovate the ways in which tourism evolves.

Keywords: scientific tourism ; sustainable tourism ; heritage tourism

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## 1. Science-Grounded Tourism Approaches

Several recent studies have focused on the potential for ST, as it is conceptualized within this article, to contribute to scientific research and monitoring, while enriching tourism experiences <sup>[1][2][3]</sup>. For example, Pacheco et al. <sup>[1]</sup> partnered with tourist operators and visitors to conduct in situ observational research of cetaceans off the Pacific coast of Peru, finding that this source of data is helpful for capturing intense local seasonal results with considerably less cost and effort, that can be integrated with information captured at large spatial scales. Cisneros-Montemayor et al. <sup>[2]</sup> emphasized the need for shark tourism management that combined best available scientific evidence, timely monitoring, and locally designed strategies with tourism operators and communities. They recognized synergistic benefits for science, education, and local economies that have arisen because of forms of shark tourism that incorporate these elements and approaches, contrasting these with negative impacts that have arisen when science has not been the primary focus. Project Aware ([projectaware.org](http://projectaware.org)), mentioned by Cisneros-Montemayer et al. <sup>[2]</sup>, provides another example of how science and tourism can be integrated for the enrichment of both. One of their most wide-scale ocean conservation campaigns employs a citizen science approach to connect adventure tourists participating in diving with an ongoing initiative to provide quantitative data and perspective on underwater marine debris.

Many examples of ST occur without intention or positioning. For example, over the past two decades, the French association, Centre Terre, has offered a series of expeditions under the brand Ultima Patagonia, which have combined adventure sports, like glacier mountaineering, caving, and cave diving, with the exploration of the Madre de Dios karst islands and international and multidisciplinary research of their unique ecosystem, focused on geology, biology, archaeology, and oceanography. The association's objective seeks to disseminate the results of their work for public benefit; in particular, for those that do not have the physical, technical, human, or logistical capacity to access these places for themselves <sup>[3]</sup>. Each of their scientific adventures recruits a group of international scientists and volunteers to participate in the expedition team and support the scientific work. The expeditions collect data, document events and conditions, and later, share their adventures through education and outreach that includes scientific publications,

documentaries, popular articles, and educational materials. This sort of initiative is very well aligned with ST development [4], and while the association does not view or position its expeditions as a form of tourism, their activities and behaviors align with the United Nations [5] definitions of tourism, visitor, and tourist.

## 2. Building Territorial Competitiveness and Coherence through Shared Valorization of Scientific Resources

The stages of the ST process align well with the iterative territorial resource patrimonialization process described by François et al. [6]. This process began with a period of discovery, in which objects were identified as having heritage potential. Next, the authors described a period of justification, during which actors appropriate and socialize the specific resource, repositioning it within the context of the situation (e.g., for the development of ST). François et al. [6] describe subsequent phases in the patrimonialization process that, for ST, could help to link territorial coherence and resilience strategies. For example, they describe a reflection that occurs during the justification stage that leads to a subsequent resource conservation process, that helps define actions or processes to safeguard the resource and ensure it maintains the value that the group has ascribed to it. Subsequently, the authors describe an exhibition phase, in which the resources are shared with the public, or in the case of ST, with tourists, leading to social recognition. Accordingly, the appropriation and valorization of scientific heritage resources, according to the iterative patrimonialization phases of the François et al. [6] model, may enable territorial actors to develop new collective priorities that protect and conserve the resource and help to develop coherence between tourism development and the protection of relevant scientific heritage.

Nunes and Sousa [7], in their recent paper on ST, territorial cohesion and competitiveness, discussed the importance of understanding and evaluating the scientific resources that exist within the territory. They advocated for TS resource priorities to focus on perfect resources, describing these as having seven characteristics: global scarcity, local abundance, local control, territorial rootedness, multiplier effects, sustainability potential, and global demand [7]. They argue that ST resources have the potential to be perfect resources, and that the effectiveness of their intervention is improved through greater coherence (geographic, institutional, economic,) between the resource and the territory. Thus, the authors pose that effective ST development processes require appropriate coordination and governance, appropriate mechanisms for developing knowledge across actors, a combination of formal and informal interaction dynamics, and a regional economic and social structure that is open to innovation and transformation [7].

Bourlon [8] expanded on the concepts of ST, patrimonialization, and territorial coherence, positing that these processes occur within the five steps of an effective ST process, when ST resources are identified and shared in a manner that permits local stakeholders to evaluate and align within the territorial priorities. When this occurs, a scientific resource is transformed from being a generic, or universal, scientific concept, into a specific, place-based scientific resource, that is valued and recognized by TS stakeholders within the territory. This is particularly important for rural-based destinations. Rural tourism relies on the active involvement of the community [9], developing shared knowledge and understanding of place-based scientific phenomena that can contribute to territorial resilience. Moreover, the reappraisal of the local heritage, which is a key point in rural tourism [10], is enhanced by aspects addressed by ST initiatives that strengthen environmental protection and cultural awareness [11].

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