[FC-03-006] Landscape and Place

Abstract

Landscapes are important socio-ecological systems that play a central role in understanding and managing intricate relationships between humans and their environment. Over time, individuals and groups develop a sense of place and form deep cultural connections with landscapes, which in turn influence how people perceive and interact with them. This means that it is essential to incorporate a sense of place and cultural connections into landscape-related studies and landscape management efforts to ensure success. GIS are a useful tool for effectively mapping the biophysical and socioeconomic elements of landscapes and can integrate these representations through their shared geography. However, there are significant challenges in capturing and representing cultural perceptions and sense of place in a GIS. Since successful landscape management is participatory and collaborative, the limitations of GIS need to be acknowledged, but the strengths of GIS when used to support participatory work should be capitalised upon. A collaborative approach using participatory GIS can help to collect holistic data that can capture some of the cultural narratives intertwined with the landscapes we seek to manage within the spatial framework provided by GIS.

Keywords: Cognitive and social foundations, landscape aesthetics, participatory mapping, place, public participation GIS

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Explanation

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1. Definitions

Landscape: Landscape is defined as “everything you can see when you look across a large area of land, especially in the country” (OLD 2025). It often relates to the portion of the Earth’s surface that can be seen from a particular singular vantage point.

Place: Place is often used in the sense of action space or space within which humans carry out habitual aspects of their lives e.g. shopping, work, recreation. These spaces are unique

to individuals and vary through time. Place is also used in the sense of community or neighborhood. Boundaries of place tend to be specific to individuals, time dependent, and inherently vague (Goodchild, 2011).

Topophilia: Topophilia is a term used by Tuan (1974) to describe sense of place. It relates to the "affective bond with one's environment - a person's mental and cognitive ties to a place" (Heimer, 2005)

Ethnophysiography: Ethnophysiography relates to a conceptualization of things in landscapes using language and linguistics to help understand human–landscape relationships. It is related to the study of 'place', 'sense of place', and 'place attachment' (Mark and Turk 2003; 2004; 2017; and Mark et al. 2011)

Sense of Place theory (SOP): Sense of Place relates to a conceptualization of individual and group relationships with their biophysical environment, in a series of key assertions relevant to social-ecological systems: SOP forms through experience, although experience is not solely individualistic, but also social; SOP emerges from human interaction with the biophysical environment; place meanings and attachments are subjective, but they vary systematically, so although each person's SOP is technically unique, the variation is patterned rather than random; and patterned relationships with place help to predict specific types of behavior.

Participatory GIS: Participatory GIS combines GIS with community knowledge and perspectives to create maps that are more relevant to the community. It prioritizes active participation of local people and recognizes the importance of local knowledge.

2. Introduction

Over the last 30 to 40 years GIS have helped to provide a framework to study the complex interactions between natural and human environments. As a result, GIS has revolutionized the way we understand and analyze the relationship between people and landscapes. This is where landscapes are seen as a way of demarking large areas of land that have some significance to people and where spatial analysis attempts to delineate the spatial organization of landscapes and the features they contain.

The term landscape varies in its interpretation and definition, a variation that potentially impacts the ways we think about, and undertake, science relating to landscapes. Differing perspectives and interpretations of a landscape also impact the effectiveness of conservation or environmental management activities. Disciplines like landscape ecology that utilize GIS have long helped us to understand the relationship between landscape patterns, processes and change, where patterns and processes in landscapes and associated changes are influenced by human intervention. Ever since people have been on Earth, human activity has been impacting natural patterns and processes. This has resulted in most of the landscapes we see today being the product of natural and human-induced processes operating at different time scales. This signals that landscapes are inherently socio-ecological systems, which means that managing them should involve considering a range of interactions that occur at a variety of landscape scales and timeframes.

Recently holistic landscape ecological approaches have attempted to acknowledge

landscapes as socio-ecological systems that integrate cultural and social considerations and recognize the importance of local communities and different world views and perspectives in understanding landscapes. As a result, this challenges GIS to be able to encapsulate people's associations with landscapes, necessitating a greater understanding of not just landscape but also the concept of 'place'. Whilst representing landscape in a GIS is a way of helping humans to visualize the world; 'place', is a human construct that helps us to understand the world often through the eyes of the individual making it more complex to represent. The vagueness and emotional connection that can often surround the notion of place makes quantifying place in the widest understanding of the term difficult in a GIS environment because it is not as simple as just representing it as a location. This generates discussion in the spatial sciences about the difference between space and place.

This entry explores ideas that acknowledge cultural perspectives and cognition of landscapes, and place and how these relate to the study, understanding, and management of landscapes as complex socioecological systems within the GIS context. Potential roles for GIS in the process of study and management of landscapes as integrated socio-ecological systems are identified, informing the skillset that GIS users and specialists need.

3. Landscape and Place Perspectives

Place as described by Goodchild (2011) is seen as being a space constructed by people that is regularly used for aspects of their lives, and where communities and neighborhoods are formed. It reflects an emotional and affectionate connection between a particular setting and a person. Place is how people experience the world and make their world meaningful. Place can play an important role in 'developing and maintaining self and group identify' and sense of place encompasses the way people feel about places (Najafi and Shariff 2011). Tuan (1979) has also described place as being "space infused with human meaning". Place therefore requires 'humanistic understanding' and is much more than just a location. Place has played a significant and historical role in geography with space and place defining geography and geography being informed by the concept of sense of place, yet in the GIS context it is quite difficult to visualize.

The technical definition of landscape based on visibility, relies on human observation, perception, and cognition. Application of landscape in disciplines (e.g. geography, landscape ecology, planning), and land management (conservation, natural resource management) extend this definition to take a broader concept of landscape as an integrated unity of interacting human and physical factors, moving beyond perspectives of landscape as a visible scene.

Core elements that occur frequently in landscape studies include spatial features and organization, mental (cognitive) entities, temporal dimensions, a nexus between nature and culture, and systemic properties such as resilience and complex dynamics. Landscape studies also include biophysical, anthropogenic, and intangible elements based on individual or social perceptions, as well as coupled social-ecological or integrated interpretation, where the landscape is seen as a whole, incorporating natural, human and cultural dimensions. Beyond landscape as something 'viewed', landscapes can also be defined based on sound, smell, and touch (Mark et al 2011). An important consideration is also whether an observer is active or passive in the landscape i.e., does the landscape

contain them, or is it just a backdrop to their existence? The notion of being active or passive in landscapes relates to the idea that you can view a landscape as an insider where you live in the landscape and are a part of it or from the outside where you hold an objectified concept of it. Taking a more anthropological view of landscape means that it also be quite difficult to conceptualize fully in the GIS environment.

4. Sense of Place

Topophilia links landscape to place. Tuan (1974; 1979) recognized that personal encounters with space (i.e., through landscapes) could produce a 'sense of place'. Tuan's theories highlight the complexities involved in landscape associations, and the importance of recognizing perceptions, attitudes, and values associated with landscapes. It is important to consider these wider concepts in landscape analysis since no two people perceive the same reality associated with a landscape and no two social groups evaluate the landscape the same way.

The development of sense of place (SOP) theory helps to determine the contributions that concepts of place can make to landscapes as social-ecological systems. Understanding how people relate to place is key to sustainable development and SOP is critical in this understanding. Recent work has used SOP, building on related concepts in topophilia, combined with participatory mapping, to explore ecosystem services in landscapes, including mapping special places/places of value as a proxy for attachment to place. Ethnophysiography as a conceptualization of landscapes can also assist in identifying sense of place, including within GIS.

5. Ethnophysiography

Ethnophysiography considers whether people from different cultural and linguistic backgrounds think about landscapes the same way or whether this varies significantly across cultures. It also considers how influential culture, and the lifestyle of people are on their conceptualizations of landscape. Identifying what cultural and spiritual considerations that turn a 'space' into a 'place' are also deemed significant.

Perspectives and associated concepts of landscapes that are evident from Ethnophysiography illustrate that complex cultural relationships exist varying between cultures and therefore these need to be encapsulated within attempts to define landscapes. This variation in perspectives between cultures creates challenges for landscape management and in particular representation of landscapes in GIS. The issue is further complicated when analyzing the interpretations and meanings of the term 'place' that are evident from different languages (Blaschke et al. 2018).

To illustrate the complexities Mark and Turk (2003) pointed out that Aboriginal Australians do not separate spirituality from topography, so spirituality is part of the landscape. The fact that landscape elements like a waterhole have a spirit influences how people behave at these locations. Similarly, Murton (2011) emphasizes deep cultural and spiritual associations between Māori and landscapes in Aotearoa New Zealand. In Māori tradition, the physical world is deeply connected to ancestors, significant events, occupations, and

cultural practices. Everything exists in a web of relationships across space and time, woven together through whakapapa—genealogy. Whakapapa serves as a guiding structure for understanding lineage, historical patterns, and connections, where all things, both living and non-living, are interconnected within a grand family tree or a universal taxonomy.
This connection is further illustrated by Māori who traditionally bury the placenta, symbolically recognizing the bond between individuals and their landscape of origin and tying their identify to the land. This means that a range of world views and knowledge needs to be considered in relation to understanding landscapes and place in the quest for sustainable landscape management and understanding spatial and temporal changes associated with place. To be able to encapsulate this complexity in a GIS environment requires holistic and multidimensional thinking and innovative visualization.

6. Interpreting 'Sense of Place' Spatially and Mapping Place Values – Participatory Mapping

When it comes to representing place in GIS it is complex as people relate to place whereas GIS work on the concept of space (Blaschke et al 2018). Many studies that have looked at putting sense of place into a GIS use predefined boundaries like national park boundaries or those around urban centers and do not consider personal perceptions and interpretations of place. As a result, these boundaries might not adequately represent place as considered by an individual. Challenges arise because GIS has traditionally relied on crisp boundaries represented by points, lines, polygons and raster cells to represent objects in space and time whereas place is a vague construct of the human mind. A simplistic solution is to assign place using point or polygons and attach place specific information and descriptions to this geographical location, but this potentially lacks the ability to adequately capture sense of place. To assess SOP spatially, Brown and Raymond (2007) used participatory mapping methods asking respondents to map special places or places of value. They found mapping spiritual value could proxy for place attachment.

Brown et al. (2020) stated that mapping place values could help to assess both clear and hidden relationships to places. However, Gottwald et al. (2022) argued that this approach fails to recognize the intensity of the human–nature relationships and connections and the specific meanings that are related to them. Instead, they focused on looking at how SOP theory can be combined with ecosystem services to better understand place-based relationships and connections using participatory mapping. They focused specifically on river landscapes and the subjective perceptions that people have towards them. In their study, they investigated the meanings and attachments that respondents attributed to important places and examined how physical surroundings, and socio-economic factors influence these meanings and attachments.

Gottwald et al. (2022) identified that a single place can mean different things to different people with people forming strong attachments in various ways. They recognize that place attachments can be broken down into the intensity and dimensions of the attachments, dividing them into two main parts: place identity and place dependence. Place identity is about emotional connections to place so can be, measured with items such as 'I feel X is a part of me' whilst place dependence focuses on the "functional attachment" or how well a place meets human needs. Place dependence can therefore be assessed with items such as 'X is the best place for what I like to do'. In contrast, place meanings describe why people

connect to landscapes, e.g., aesthetic beauty, spiritual values, or variety of plants and animals. They interpreted that “there is no meaning without attachment and no attachment without meaning.” Gottwald et al. 2022 pg. 634) highlighting the complexities of putting these in a spatial context. Assessing place attachment, identity, and/or meaning in terms of an individual’s interpretation of space and place is where the challenges in a GIS environment still lie yet this needs to be more adequately addressed for more effective landscape management. And despite a better understanding of attachment and meaning Gottwald et al. (2022) recognized that there is still a gap in terms of understanding the emotional connections with landscapes.

Building on ideas from Ethnophysiography it is thought that understanding how people relate to a place through the language they use about it, can assist in landscape management and land use decision making. Mark and his colleagues explored Ethnophysiography (Mark et al. 2011) within the context of GIS and indigenous knowledge and mapping systems where conceptualizing landscape and capturing different ways of naming landscape features is important. Their aim was to improve the cognitive and cultural aspects of GIS (Turk and Stea 2014). Their work has contributed to the advancement of GIScience in this area and has helped to support the preservation of indigenous culture and language (Mark et al. 2007). However, to date, the translation of this into landscape management applications has been limited. Further work is therefore needed for GIS (and spatial data) to address language (Ethnophysiography) and temporal dimensions of landscapes and place.

The term "place-based GIS" has been adopted to describe the field of GIScience that focuses on determining the meaning of place and working to address the concept of place in GIS. Key to this is individual perceptions and being able to appropriately formalize place in a way that can be represented in GIS environment. Despite advances in GIS, challenges still exist, and more research and development are needed to expand GIS capabilities to be able adequately represent sense of place and the subjectiveness of this human construct.

7. Summary

Although GIS offer well developed tools for representation and understanding of biophysical and many socioecological features of landscapes, data limitations remain when trying to fully encapsulate anthropological conceptualizations of landscape and place within a GIS. This means that GIS specialists need to be rigorous and honest on the relevance and use of data for landscape analysis that does not adequately capture sense of place and attachment. Participatory GIS offers potential to capture some of the cultural narratives intertwined with the landscapes we seek to manage within the spatial framework provided by GIS. However, there is still much more work to be done especially in adequately being able to represent different perspectives and cultural connections which can often be lost in the Western science interpretations of landscapes and place.

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