

Short Note

Using business names as an indicator of oysters' cultural value

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ABSTRACT

Business names, as recorded by state tax departments, offer a possible indicator of cultural ecosystem services provided by nearby natural resources. Using oysters in the Chesapeake Bay as an example, we process spatial and quantitative analyses that can potentially identify cultural value for integration into monitoring efforts that aim to incorporate a variety of ecosystem services. Businesses named directly after oysters provide a useful lens to capture the many reasons people value oysters culturally, but also provide an easy aggregate indicator that could potentially be added to regular regional monitoring programs in order to factor in cultural value to adaptive management policies.

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1. Introduction

Along the Chesapeake, the roads of many communities are literally paved with oyster shells. Legends of oyster wars persist, and many still gather for annual skipjack races to watch traditional sail-powered fishing boats show off their skills (Wennersten, 2007). At the same time, there is a move toward ecosystem-based management of the bay, which integrates long-standing concerns about upstream activities with fishery rules. This is especially true for the oyster, as a keystone species that creates both a lucrative fishery and habitat for many other iconic Chesapeake fisheries (Chesapeake Bay Fisheries Ecosystem Advisory Panel, 2006) and a cultural connection for those living within and visiting the Chesapeake Bay watershed. This, in order to manage the species in a true ecosystem-based context, management measures must address the strong cultural connection Chesapeake citizens feel for the tasty bivalve. Yet we have few ways of keeping track of that connection over time.

To implement ecosystem-based management in a system as complex as oyster reefs, a seemingly endless number of factors must be distilled into a subset that can be regularly monitored. Indicators and their related reference points comprise this subset and serve as an ecosystem status snapshot on which to base management decisions (Rice and Rochet, 2005). One of the main challenges in monitoring complex systems is the temptation to measure all things all the time (Fogarty and McCarthy, 2014),

which is not financially feasible or possible with current monitoring staff (Biber, 2013). Instead, an appropriate approach may be to develop a small set of indicators in partnership with local stakeholders that will provide managers the snapshot they desire while also providing scientific insight on the dynamics of the system (Reed et al., 2005).

Focusing on Chesapeake Bay oysters, the challenge of creating indicators is shaped by both a long history of watershed-scale management and a strong cultural significance dating back to the colonial era. The region's management demand for oysters is best summarized by the Fisheries Ecosystem Plan (Chesapeake Bay Fisheries Ecosystem Advisory Panel, 2006), in which oysters are one of the five keystone species providing the bedrock for an ecosystem-based management approach. In the FEP, the cultural significance of oysters is recognized as something that needs to be included in decision-making tools, but no specific measures are suggested. Overall, the development of relevant indicators to capture the complex ecosystem dynamics of the region and the science behind those indicators is still considered in its early stages (Boesch, 2006).

One of the best ways to channel the complexity of the Chesapeake ecosystem into more easily comprehensible segments—like indicators—is through the use of ecosystem services (Tallis et al., 2012), especially in the delivery of downstream services as a desirable outcome for management (Tuvendal and Elmqvist, 2011). Oyster reefs are an excellent example of this, as the restoration community demands ecosystem-based metrics that would demonstrate the full suite of benefits of restoration investments (Baggett et al., 2015). In this case, one of the important ecosystem services is to support the cultural value of oysters

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(Keiner, 2009). Therefore, the best means of meeting the need to track cultural connections to oysters over time is to develop an easy-to-use indicator for the cultural value of oysters. The question is how best to do this.

Often, when people talk about the human dimensions of an ecosystem, they refer to the need for 'socioeconomics'. It is easier to create indicators for the economics side of the hybrid socioeconomic term, as the metrics of the field tend to be quantitative, and therefore easier to integrate with biophysical indicators. Quantitative metrics are important in management contexts in order to be able to evaluate tradeoffs and establish thresholds for action, as expressed in FAO and UNESCO forums (Cury and Christensen, 2005). For example in a fisheries community, landings, profitability, and employment trends are commonly collected metrics of community well-being (Clay et al., 2014).

However, the social side of socioeconomics is more difficult, both because there are fewer established protocols for monitoring indicators and because even fewer are quantitative, spatial or both. NOAA Coastal Resources Center captures a few possibilities: gentrification, demographic trends, and dependence on fishing (Jepson and Colburn, 2013). Though these resonate with concerns in many coastal communities, they fail to capture residents' sense of place or cultural value of its resources, so something new is needed (Jenkins et al., 2016).

There are a few examples of potential indicators of sense of place or cultural value, i.e. linking ecosystem services to cultural values and outcomes. Often these are specific to a context or particular community. For example, big data approaches to mine social media for how people tweet, Facebook, and Instagram about their town and associated resources can yield immense amounts of

data (Jenkins et al., 2016). However, social media users are generally younger and more urban than the general population, so they may only capture a portion of the overall sense of place. Conversely, surveys or, more commonly interviews, can directly assess people's sense of place and values of natural resources (Raymond et al., 2009; Paolisso, 2002). But these methods are labor intensive and generally only deployed in a single community context.

Responding to this need for easily collected and used indicators of sense of place and cultural value, we used three criteria to determine what would make a useable, easily gathered, and feasible indicator:

- Quantitative, spatial, or both, in order to be easily integrated with more traditional indicators of ecosystem health (Babcock et al., 2005).
- Data coverage is available at the appropriate scale and timing for management decisions (Greenstreet and Rogers, 2006). For the Chesapeake, this is at the state level with annual monitoring.
- The data is open source or otherwise publicly available for free or cheap, so that it can be added to regional databases with open data requirements (Whyte and Pryor, 2011)

One possibility meeting this set of criteria is to use business names in the region as a reflection of appreciation for nearby natural resources. Business data are collected regularly for tax purposes and are generally available to the public. Businesses occurring throughout the watershed are registered at the state level, and can be quantified on a per-capita basis or analyzed spatially alongside locations of relevant natural resources. The rest of this discussion will show an example of this indicator utilized for

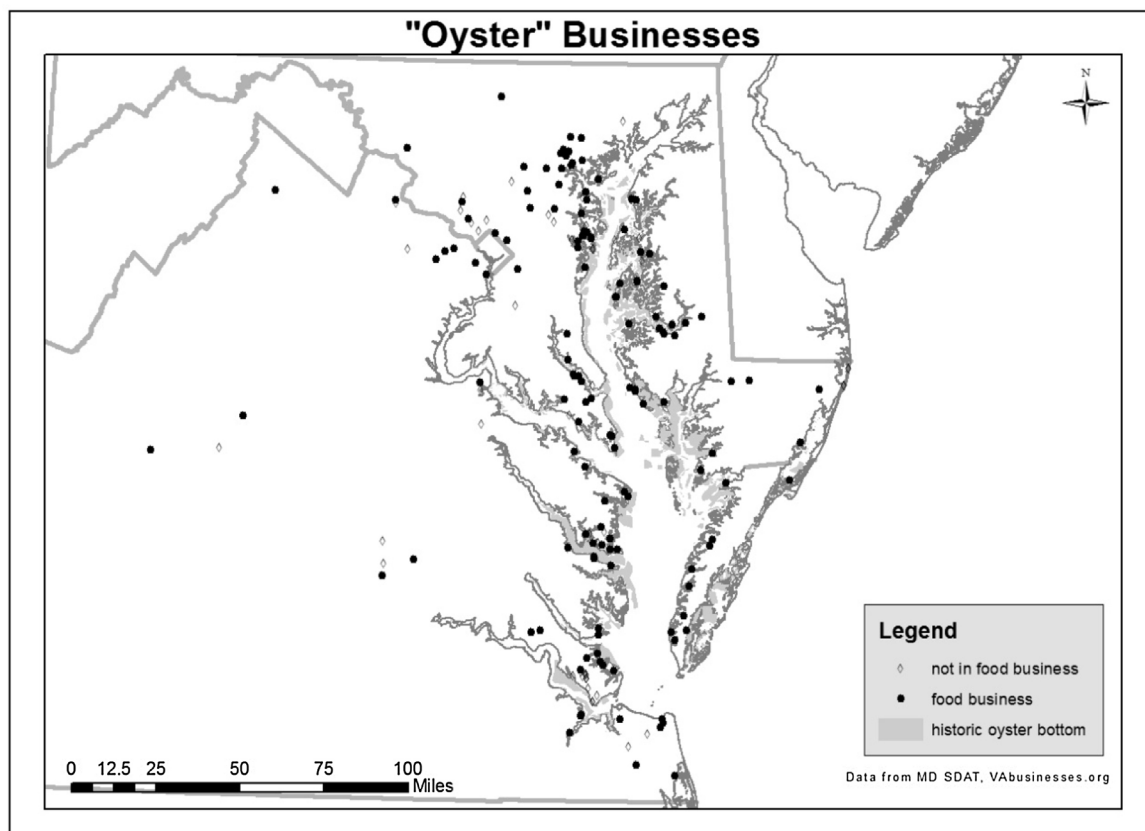


Fig. 1. Location of businesses named after oysters overlaid on historic oyster extent.

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