The blue economy: Identifying geographic concepts and sensitivities

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Abstract
There is currently no generally accepted definition for the “blue economy,” despite the term becoming common parlance over the past decade. The concept and practice have spawned a rich, and diverse, body of scholarly activity. Yet despite this emerging body of literature, there is ambiguity around what the blue economy is, what it encapsulates, and its practices. Thus far, the existing literature has failed to theorise key geographical concepts such as space, place, scale, and power relations, all of which have the potential to lead to uneven development processes and regional differentiation. Previous research has sought to clarify the ontological separation of land and sea or has conceptualised the blue economy as a complex governmental project that opens up new governable spaces and rationalises particular ways of managing marine and coastal regions. More recently, geographers have called for a critical—and practical—engagement with the blue economy. This paper critically examines the existing literature of the geographies of the blue economy through a structured meta-analysis of published work, specifically its conceptualisations and applications to debates in the field. Results offer the potential to ground a bottom-up definition of the blue economy. In so doing, this paper provides a clearly identifiable rubric of the key geographical concepts that are often overlooked by researchers, policymakers, and practitioners when...
promoting economic development and technological innovation in coastal and marine environments.

1 INTRODUCTION

In a time of substantial interest in the blue economy (BE), little research actively explores the geographical concepts, sustainability dilemmas, and justice components surrounding the BE. Despite the term BE becoming common parlance over the last decade, there is still no generally accepted definition, and recent studies focused on the BE have taken differing approaches. Silver, Gray, Campbell, Fairbanks, and Gruby (2015) focus on emerging discourses around the term BE; Doloreux (2017) takes a more practical view, considering real-world blue economies through a survey of maritime clusters as a response to economic competitiveness, while Voyer, Quirk, McIlgrom, and Azmi (2018) classify the BE into four differing interpretations (oceans as natural capital, oceans as livelihoods, oceans as good business, and oceans as a driver for innovation) and analyse how these relate to ocean governance. Attempts to engage with the BE may be understood and applied in various ways as a result of differing stakeholder interests and objectives, resulting in contests related to meaning and applicability (Amsler, 2009). Evidence from the literature (Choi, 2017; Bear, 2017; Doloreux, 2017; Eikeset et al., 2018; Foley, 2017; Michel, 2016; Silver et al., 2015; and Voyer et al., 2018) suggests that there is substantial ambiguity around what the BE is, what it encapsulates, and what its practices entail. Despite previous attempts to address this, research to date has failed to integrate key geographical concepts such as space and place, proximity and distance, scale and connection, and relational thinking (Jackson, 2006) within conceptualisations of the BE. Understanding the geographical underpinnings of the BE are urgently required to enable characterisation of spatial dimensions, especially in terms of developing an understanding of uneven development when considering the link between innovation in the BE (e.g., energy production innovations such as tidal or offshore wind power) and its impact on uneven development (Kerr et al., 2018; Morrissey & Heidkamp, 2019). Perspectives that are economically important, politically central, socially relevant, and environmentally sensitive are currently being omitted in the existing BE discourses (e.g., Doloreux, 2017; Silver et al., 2015; Voyer et al., 2018).

1.1 Aims and objectives of the study

Research on the BE to date is disparate, is multi-faceted, and does not conform to central geographical themes and understandings. Numerous implementations and perspectives of the BE emerge from international, supranational, and national institutions. For example, Winder and Le Heron (2017) call for increased critical—and practical—engagement with the BE, while previous research has sought to clarify the ontological separation of land and sea (Bear, 2017); others have conceptualised the BE as a complex governmental project that opens up new governable spaces and rationalises particular ways of governing (Choi, 2017; Germond & Germond-Duret, 2016). The focus of this paper therefore addresses what we view as an important gap in knowledge by questioning the idea of a unified definition of BE development. Through an exploration of policy-related documents that involve the UN, EU, and United States1 and scholarly work that engages with BE policy, a meta-analysis was conducted to ascertain the meanings and geographical concepts that underpin the BE (Table 1).

In particular, our investigation of the BE centres on the nexus of sustainability, environmental justice, and equity—akin to Agyeman, Bullard, and Evans's (2010) focus on just sustainabilities or Swilling and Annecke's (2012) just transitions—and the key importance of these themes to emerging geographical discourse on the BE. Such themes are, at present, largely missing from the debate on the operationalisation of the BE or may be understood in a muddled or contradictory manner. As an example, the European Union (EU) marginally refers to environmental...
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<tr>
<td>Alexander and Graziano (2019)</td>
<td>What scale mismatches are presented in non-critical conceptualisations of MSP as a tool?</td>
<td>Local: Great Barrier Reef, Australia; Scottish National Marine Plan, United Kingdom; Massachusetts OMP, USA</td>
<td>Case study research</td>
<td>DPSWR framework identifies the mismatches in the limitations of MSP as a tool for developing ocean management.</td>
<td>Space and place; scale and connection</td>
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<td>Axon (2019)</td>
<td>How can coastal sustainability transitions be developed using theory and practice?</td>
<td>Local: Guernsey, British Channel Island and Cape Wind, Massachusetts, USA</td>
<td>Case study research</td>
<td>Sustainable coastal transitions must have an understanding of identity, marginality, and engagement concepts that inform specific localised characteristics of coastal places.</td>
<td>Governance and power relations; scale and connection; proximity and distance; scale and place</td>
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<td>Barbesgaard (2018)</td>
<td>What are blue growth solutions towards conservation and climate change issues?</td>
<td>Analysis of existing documents</td>
<td>Blue growth solutions fail to restore &quot;ocean health&quot; by emphasising control and access rights to blue resources. Small-scale users suffer while large-scale, capital-intensive uses continue.</td>
<td>Scale and connection; governance and power relations</td>
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<td>Bear (2017)</td>
<td>How can geographical research be taken further towards a fuller engagement that contribute to new practices, policies, and (de) territorialisation’s?</td>
<td>Analysis of existing documents</td>
<td>Ocean &quot;liveliness&quot; establishes challenges with socio-spatial and scalar conflicts. Dynamic ocean management builds fluidity and emergence into ocean management and governance.</td>
<td>Governance and power relations</td>
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<td>Brewer (2017)</td>
<td>How can geographers engage with marine policy associated with the BE agenda?</td>
<td>Analysis of existing documents</td>
<td>A pragmatic approach focused on human–environment and spatial traditions and the bridging together of positivist and critical epistemologies are relevant to</td>
<td>Space and place; proximity and distance; scale and connection</td>
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<td>Burgess, Clemence, McDermott, Costello, and Gaines (2016)</td>
<td>How can a pragmatic approach be applied to blue growth management?</td>
<td>Analysis of existing documents</td>
<td>A pragmatic approach that is centred on defining objectives, quantifying trade-offs, and being efficient; extracting cross-system similarities; engaging stakeholders; measuring impact; and designing institutions, not behaviours is needed.</td>
<td>Governance and power relations; scale and connection; proximity and distance; scale and place</td>
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<td>Choi (2017)</td>
<td>The BE is a governmental project that creates new governable spaces and justifies new ways of governing.</td>
<td>National: China</td>
<td>Case study research</td>
<td>China's BE is being developed to open new spaces for accumulation and to create a &quot;spatial intervention&quot; that (re) arranges people and marine resources.</td>
<td>Governance and power relations; scale and connection; space and place</td>
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<td>Colgan (2007)</td>
<td>What defines an ocean economy and coastal economy?</td>
<td>National: USA</td>
<td>Supplemental report and data on the coast and ocean economies of the United States by the NOEP</td>
<td>OE is defined as all economic activity that derives all or part of it inputs from the ocean or Great Lakes. CE is defined as all economic activity in the near shore region, coastal zone counties, and coastal watershed.</td>
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<td>Doloreux (2017)</td>
<td>What are maritime clusters and how are they defined?</td>
<td>International: different maritime clusters around the world.</td>
<td>Case study research</td>
<td>Maritime clusters are defined three ways: (1) an industrial complex, (2) an agglomeration of interlinked industries, and (3) a community-based network.</td>
<td>Scale and connection</td>
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<td>Doloreux and Shearmur (2009)</td>
<td>What are the driving forces and development process for maritime clusters</td>
<td>National: Canada</td>
<td>Case study research</td>
<td>The presence of clients; industrial suppliers; industrial interdependence; and a certain degree of competition between</td>
<td>Space and place; scale and connection; governance and power relations</td>
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<td>Dongmei, Hongbo, and Miyao (2018)</td>
<td>What is the coordination degree of regional marine scientific and technological innovation in blue economic development of the Shandong peninsula?</td>
<td>Local: Shandong peninsula</td>
<td>Case study research</td>
<td>Degree of coordination between regional marine scientific and technological innovation and blue economic development depends on joint efforts of all to commonly develop.</td>
<td>Space and place; scale and connection; relational thinking</td>
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<td>Eikeset et al. (2018)</td>
<td>What challenges and opportunities do varying definitions of blue growth present?</td>
<td></td>
<td>Analysis of existing documents</td>
<td>Challenges for blue growth are lack of agreed-upon goal of blue growth; need for interdisciplinary approaches; knowledge gaps; and resolving conflicts of interest. Co-development with stakeholders is required.</td>
<td>Space and place; scale and connection; relational thinking; proximity and distance</td>
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<tr>
<td>European Commission Report (2017)</td>
<td>How can the blue economy be a driver</td>
<td>International: EU</td>
<td>Secondary data</td>
<td>Contribution to jobs and growth; policy for innovation; mobilise market forces; collaboration in</td>
<td>Governance and power relations</td>
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<td>Foley (2017)</td>
<td>How can the BE be further developed to incorporate bioeconomic relations, ethics, and politics?</td>
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<td>Analysis of existing documents</td>
<td>A relational conception is needed for an integrated and connected vision of the value of the blue.</td>
<td>Relational thinking</td>
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<td>Germond and Germond-Duret (2016)</td>
<td>Are oceans placeless or placeful? What is the significance of ocean governance in the EU’s narrative and practice?</td>
<td>International: EU</td>
<td>Case study research</td>
<td>EU's BE practice demonstrates that the ocean is placeful and the narrative justifies ocean governance and maritime security. However, the narrative still consists of a number of placeful and placeless representations.</td>
<td>Governance and power relations; space and place; relational thinking</td>
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<td>Graziano, Alexander, Liesch, Lema, and Torres (2019)</td>
<td>What is the current state of all BE industries in the Great Lakes basin?</td>
<td>Local: Great Lakes Basin, USA</td>
<td>Case study research</td>
<td>Differences among state basins and different characteristics that BE clusters have present issues of social, ecological, and economic scale across multiple jurisdictions.</td>
<td>Scale and connection; governance and power relations</td>
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<td>Johnson and Hanes (2019)</td>
<td>What is the social carrying capacity of aquaculture in Maine?</td>
<td>Local: Maine, USA</td>
<td>Analysis of existing documents/case study research</td>
<td>Finding ways to not exceed the social carrying capacity of development towards aquaculture is essential for</td>
<td>Relational thinking; power relations</td>
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<td>Kelly, Ellis, and Flannery (2019)</td>
<td>What approach is needed for an integrated and sustainable management of estuaries and coasts in Ireland?</td>
<td>National: Ireland</td>
<td>Case study research using interviews</td>
<td>An “Integration Transition Pathway” based on the key concept of transition management facilitates integrated management within short-, medium-, and long-term governance change.</td>
<td>Scale and connection; governance and power relations; space and place</td>
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<td>Kerr et al. (2018)</td>
<td>How can social sciences and humanities research be integrated into the design of new marine energy seascapes?</td>
<td>International: EU</td>
<td>Case study research</td>
<td>Social sciences and humanities can help developers and scientific institutions to design a reflexive discourse necessary for creating long-lasting trust between all involved in the emergence of marine renewable energy.</td>
<td>Relational thinking; scale and connection; space and place</td>
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<td>Ketels and Protsiv (2017)</td>
<td>European Cluster Panorama 2016 that provides an update on clusters across Europe.</td>
<td>International: EU</td>
<td>Orbis historical dataset on economic performance of firms.</td>
<td>“Blue growth” is defined as development and use of the potential of oceans, seas, and related infrastructures; any inland freshwater sources and their exploitation. “Blue growth industries” include all sectors and industries related to maritime environment and freshwater sources.</td>
<td>Governance and power relations; scale and connection</td>
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<tr>
<td>Lewis (2019)</td>
<td>How is BE thinking in New Zealand addressing interests and concerns towards categorisation, conceptualisation, and regulation?</td>
<td>National: New Zealand</td>
<td>Case study research</td>
<td>Attention towards re-categorisation of economy; new economic objects of concern; and to a potential politics of economic rent and social return must be established in order extend BE</td>
<td>Scale and connection; governance and power relations</td>
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<td>Mee (2012)</td>
<td>Is Integrated Coastal Zone Management (ICZM) a useful policy paradigm?</td>
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<td>Analysis of existing documents</td>
<td>Scale mismatches and different interpretations of ICZM present problems in being a useful policy paradigm to resolve problems existing at other scales. Work in innovation, horizon scanning, scales, and governance is needed to resolve these problems.</td>
<td>Space and place; scale and connection; governance and power relations</td>
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<td>Morrissey, O’Donoghue, and Hynes (2011)</td>
<td>How is the marine sector in Ireland quantified, defined, and described?</td>
<td>National: Ireland</td>
<td>Case study research</td>
<td>Ireland’s marine economy consists of a large number of companies operating across a variety of sectors. Marine sectors are classified into: marine services, marine resources, and marine manufacturing.</td>
<td>Scale and connection; space and place; governance and power relations</td>
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<tr>
<td>NOAA (2018)</td>
<td>What benefits come from the oceans and Great Lakes that result in jobs and wages that contribute to GDP?</td>
<td>Local: Great Lakes, USA</td>
<td>Secondary data</td>
<td>Ocean economy includes six economic sectors: (1) living resources; (2) marine construction; (3) marine transportation; (4) offshore mineral extraction; (5) ship and boat building; and (6) tourism and recreation.</td>
<td>Governance and power relations</td>
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<td>Pauly (2018)</td>
<td>How can small-scale fisheries play a role in global blue economy?</td>
<td>Analysis of existing documents</td>
<td>Industrial fisheries tend to be incompatible with BE. Small-scale fisheries represent the future of sustainable fisheries needed for a long-term sustainable BE.</td>
<td>Scale and connection</td>
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<td>Shell (2013)</td>
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<td>International: EU</td>
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<td>Silver et al. (2015)</td>
<td>How is the BE articulated within competing discourses of human–ocean relations?</td>
<td>Analysis of existing documents</td>
<td>Blue energy, aquaculture, marine and coastal tourism, marine mineral resources, and blue biotechnology are all drivers for blue growth.</td>
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<td>Soma, van den Burg, Hoefnagel, Stuiver, and van der Heide (2018)</td>
<td>How can blue growth adequately enable social innovation as a strategy for the use and management of marine resources?</td>
<td>International: EU</td>
<td>Case study research</td>
<td>Long-term sustainable development in blue growth requires a social innovation perspective that focuses and depends on cooperation, inclusiveness, and trust.</td>
<td>Scale and connection; space and place; relational thinking</td>
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<td>Voyer et al. (2018)</td>
<td>How is the BE conceived by different actors? How is the BE enacted? How is the scope of the BE defined?</td>
<td>Analysis of existing documents</td>
<td>The BE is articulated through 4 clusters: oceans as natural capital, oceans as livelihoods, oceans as good business, and oceans as a driver for innovation.</td>
<td>Governance and power relations</td>
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<tr>
<td>Winder and Le Heron (2017)</td>
<td>What is the BE and how can geographers engage with it?</td>
<td>International: EU National: New Zealand</td>
<td>Case study research</td>
<td>In geographic terms, BE projects are territorial, economic projects based on (un)known interdependencies and temporalities.</td>
<td>Governance and power relations; scale and connection</td>
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sustainability in most of its BE-related documents, which concentrate on the significance of industrial sectors (e.g., oil and gas extraction) that may in fact harm marine and coastal ecosystems. By shedding light on such missing pieces and contradictions, this article highlights striking gaps in this emerging research agenda and offers a clearly identifiable rubric of the key geographical concepts that are often overlooked in study of BE; ignoring these concepts may have a significant impact on uneven development processes and on the realisation of sustainability imperatives.

2 | IMPLEMENTATIONS, PERSPECTIVES, AND UNDERSTANDINGS OF THE BLUE ECONOMY

Political institutions formulating BE policy like the UN, EU, and United States not only define which human activities constitute the BE but also support these activities and effectively shape the framework of BE development in some cases. Policymakers, ultimately, have the ability to create the boundaries of the BE and what elements should take precedence when considering broader national interests. The definitions developed by policymakers and their consequential policies often influence the domain within which BE studies are conducted (Kwak, Yoo, & Chang, 2005; Morrissey et al., 2011), thus guiding the focus of scholars even when they attempt to self-define the boundaries of BE (Doloreux, 2017; Doloreux & Shearmur, 2009; Silver et al., 2015; Voyer et al., 2018). Of course, these definitions can be challenged, prompting a two-way relationship among the actors (Burgess et al., 2016; Eikeset et al., 2018).

The United Nations (UN) has played a pivotal role in establishing the term “blue economy” and its associated principles, both in the period preceding and during the 2012 UN Conference on Sustainable Development (a.k.a. Rio +20) (Silver et al. 2015). During the summit, four different discourses emerged as “frames” for principles and practices of the BE: “Natural Capital,” “Good Business,” “Pacific Small Islands Developing States,” and “Small-scale Fishers Livelihood.” Each of these discourses applied different ways of framing the ocean–human interaction and constituent actors and agendas (Silver et al., 2015). The Rio+20 summit did not reach a specific consensus on a definition of BE; however, the term was popularised, and the UN specifically addressed the existence, use, and founding principles of the BE, thereby problematising it as a parallel paradigm to the green economy (UN, 2014). These parallels to the “green economy” were made clearer in 2014, as the BE was said to "... [espouse] the same desired outcome as the Rio+20 Green Economy initiative ..." (UN, 2014, p. 3), with a specific focus on improving human being and social equity, while managing ecological scarcities and environmental risks (UN, 2014). In explicitly creating this parallel, the UN integrated social justice and equity, along with environmental sustainability principles into BE and green economy concepts, thus formulating the central elements of a new framework for sustainable development (UN, 2014). In defining the processes through which (sustainable) economic development will be achieved through the BE, the UN followed closely to the list of industries initially identified by the EU as part of their blue growth agenda (European Union (EU), 2012).

The EU was first recognised as a paradigm for regional economic growth by the EU in 2012, through a communication from the European Commission to the EU Parliament (European Union (EU), 2012). Five focus areas or sectors—(1) aquaculture; (2) marine renewable energy; (3) marine mineral mining; (4) marine biotechnology; (5) marine and coastal tourism (Sheil, 2013)—were identified as having strategic importance for realising BE, through "blue growth" (European Commission, 2017). These focus areas have been the recipients of resources from the EU in the subsequent years, including research and development (R&D) funds and various forms of sectoral support (European Commission, 2017). In defining the "boundaries" of the BE, the EU framed this clear regional economic paradigm within the boundaries of [an] environmental sustainability, by "[...] [reducing] negative environmental impacts of maritime [activities] such as the emissions of pollutants and the discharge of noxious substances" (European Commission, 2017:4).

The EU conceptualisation of which sectors are part of the BE has changed in recent years. In a pivotal report prepared for the European Commission, Ketels and Protsiv (2017) identify 18 macro-sectors, which expand the original EU list of industries to include services such as Performing Arts and Business Services, whose supporting role often
enables or expands the contributions of the original sectors identified by the EU. The focus of this work was not eco-
logical sustainability but, rather, a benchmark analysis of central and prioritised economic policies across the EU. The
importance of the contribution of Ketels and Protsiv (2017) lies in the comprehensive nature of the BE within a
framework of economic development and the spatially informed understanding of BE in contrast to other definitions
(Doloreux, 2017; Doloreux & Shearmur, 2009; European Commission, 2017; Silver et al., 2015; UN, 2014; and Voyer
et al., 2018).

In the United States, references to BE typically use different terminology and constitute a different set of con-
cepts, mostly based on economic uses of water combined with geographical proximity to it. The U.S. National Oce-
anic and Atmospheric Administration (NOAA) is the primary source of definitions and concepts associated with the
BE. Since the early 2000s, NOAA has taken an active role in introducing economic activities within coastal and
marine environments (Holland, Sanchirico, & Joglekar, 2010). NOAA plays an important role in producing BE-related
data and definitions; however, NOAA does not use the term BE. Rather, the agency differentiates between “Ocean
Economy” (OE) and “Coastal Economy (CE)”. The OE “[…] is defined as the economic activity, which indirectly or
directly uses the ocean (or Great Lakes) as an input. [The CE] is defined as all activity, which takes place in the coastal
areas” (Colgan, 2007, p. 2). These definitions are based on two main components: first, a spatial component, which
identifies the loci, the coastal and the water environments, as relevant areas of interest. The second component is
based upon industrial classifications. In the case of NOAA, however, these classifications are relatively strict, and
they include six economic sectors: (1) living resources; (2) marine construction; (3) marine transportation; (4) offshore
mineral extraction; (5) ship and boat building; and (6) tourism and recreation (National Oceanic and Atmospheric
Administration (NOAA), Office for Coastal Management, 2018).

The restricted definition of OE/CE adopted by NOAA excludes and negates the linkages with service sectors
which often sustain activities occurring in the water. For example, financial services associated with water-based
transportation, R&D and education in relevant sectors (e.g., engineering and marine biology), environmental services
(e.g., watershed restoration), or creative activities which attract tourism are not included in the definition. In recent
years, researchers have raised the issue around regional definitions of the BE, recognising that in the United States,
states and economic regions often have unique characteristics, which produce different ways in which the coast and
the water environments interact with the economy (Graziano, Billing, Kenter, & Greenhill, 2017). For example,
NOAA’s report on the U.S. Ocean and Great Lakes Economy treats each economic sector in parallel, ignoring the
potential competing uses of space and resource quality that exists between these sectors (NOAA, 2018), as well as
the potential for cross-sectoral innovation.

In the documents produced by the EU and the United States, principles of sustainability, environmental justice,
and equity do not actively inform or shape the selection or prioritisation of industrial or economic sectors considered
part of BE. Both EU and U.S. perspective of the BE are therefore characterised by a lack of an integration of the sus-
tainability and social justice principles.

There is increasing critical engagement with BE from the academic community. One of the more important schol-
larly reviews regarding the BE is Doloreux’s (2017) meta-analysis of maritime clusters. While focused on maritime
clusters, this analysis is nevertheless relevant to BE discourse due to the overlap between BE literature and the
extensive body of Ocean/Coastal literature. Doloreux provides an overview of how three perspectives define a mar-
time cluster:

1. Maritime cluster as an industrial complex based on inter-industry transactions and connections through flows of
goods and services.
2. Maritime cluster as an agglomeration of interlinked industries based on terms of knowledge, skills, inputs,
demand, etc.
3. Maritime cluster as a community-based network centred on institution networks supporting the development of
industry in certain geographical concentrations.
Doloreux (2017) views maritime clusters as institutional and economic structures focused on collaboration among different actors related to maritime industries and sea-related activities. Other analyses of the BE from Silver et al. (2015) and Voyer et al. (2018) recognise the different actors attempting to define the BE in ways that prioritise certain ocean problems, solutions, and participants over others. Their understandings of the competing discourses that arise from differences in prioritisation articulate the BE as alternatively framing oceans as natural capital, oceans as livelihoods, oceans as good business, and/or oceans as a driver for innovation (Silver et al., 2015; Voyer et al., 2018). These perspectives reinforce the understanding that maritime clusters develop from complex relationships, and these complex relationships must be analysed and understood to create a foundation for proper and effective sustainable management. The degree of coordination between the key actor relationships, emerging marine innovations, and BE development depends heavily on the successful development of networks, as evident in various jurisdictions (Dongmei et al., 2018). These networks are crucial for inter-firm relationships, collaboration, cooperation, inclusiveness, and development of trust (Islam et al., 2018; Soma et al., 2018).

Other analyses of the BE identify connections and possibilities for the economic and ecological to develop "new forms of economic behaviour within biological processes and to facilitate opportunities that deliver sustainable collective and individual benefits from the oceans" (Winder & Le Heron, 2017, p. 14). However, critiques to this aim recognise BE initiatives as being territorial based, composed of "economic projects based on unknown interdependencies and temporalities" (Winder & Le Heron, 2017, p. 21) that fail to restore "ocean health" by emphasising control and access rights to blue resources (Barbesgaard, 2018, p. 145). Such a territorial perspective incorporates a spatial dimension to BE in only the most limited and one-dimensional manner. A focus on a one-dimensional framing of territory rather than on a multi-faceted framing of space risks omitting or missing (unknown) interdependencies and temporalities arising from the incorporation of a broad range of activities, organisations, and industries in the BE (Doloreux, 2017).

Diverse institutional investment projects within the BE narrative need to be analysed using geographic assemblage thinking to identify each initiative's bioeconomic relations, ethical and political challenges, and how bioeconomic relations can be established within the discourse (Winder & Le Heron, 2017). Extending assemblage approaches even further to incorporate the fluidity of the oceans, or the "aquatic liveliness" of the oceans, establishes new challenges within the BE that reveal a number of themes: (1) different ocean spaces may be experienced and valued in the maritime domain differently; (2) the resistance the ocean may have towards the BE; (3) and the potential degree of control a state can have on the ocean (Brewer, 2017; Foley, 2017; Germond & Germond-Duret, 2016). For example, incorporating "aquatic liveliness" into understanding the possibility of ecological systems laying outside of the economic zone of a nation (Alexander & Graziano, 2019) will ultimately reveal the ocean's ability to cause socio-spatial and scalar conflicts in the BE through its mobility across spatial contexts.

Finally, from the positionality of some nation-states, development in marine and ocean spaces is perceived as an expansion of capitalist space in areas that are recognised as "underdeveloped frontier spaces" that could be better used as a capitalist economic growth model (Choi, 2017 and Germond and Germond-Duret, 2016). For other nation-states, this development of marine space is intrinsically a "spatial intervention" (re)arranging people and marine resources to maximise their economic utility (Choi, 2017, p. 39). Critical geographers who have recognised this define the BE as being strikingly similar to the green economy in the sense that a land-grabbing, complex governmental project aimed at controlling the ocean and its resources is being disguised by a promise of "collective prosperity" (Brewer, 2017, p. 45). The EU's BE practices, for example, demonstrate and justify ocean governance and maritime security, therefore making it a driver for BE development and growth (Voyer et al., 2018). However, their narratives of ocean governance and maritime security still consist of peaceful and placeless representations (Germond & Germond-Duret, 2016), and this can misconstrue proper and effective sustainable ocean management.
3 | LOCATING GEOGRAPHICAL CONCEPTS: TOWARDS A META-
ANALYSIS OF GEOGRAPHICALLY SENSITIVE DEFINITIONS

In Thinking Geographically, Jackson (2006) outlines four key geographical concepts: space and place; scale and connection; proximity and distance; and relational thinking (Table 2). Here, we apply Jackson's (2006) concepts to analyse the range of understandings of BE. A further concept of governance and power relations is added to capture the expression of power relations. These concepts are applied to understand the underpinning components of BE definitions from policy-related studies and scholarly work.

Applying these five analytical concepts when analysing the BE allows for connections to be highlighted between places and scales, to date poorly considered in research. Critical reflection on these concepts allows for a deeper understanding of the inherently geographical nuances associated with implementation of BE projects. While poorly considered to date, it is clear that these geographical concepts cannot be divorced from fully comprehensive conceptualisations of the BE. Applying a geographical lens allows for a deeper understanding of the spatial and temporal

<table>
<thead>
<tr>
<th>Concept</th>
<th>Meaning</th>
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<tr>
<td>Space and place</td>
<td>Place is humanised space; an abstract world made real through human inhabitation, through the investment of emotion and the attribution of meaning (Tuan, 1977). Harvey (1989) outlines that the process of “time–space compression” makes the world smaller through successive rounds of capitalist investment that leads to technological, political, and social change. “Time–space compression” has been described as leading to a placeless planet resulting in an erosion of local distinctiveness. Massey (1994) asserts that the distinctiveness of place is about the routes that connect them with other places and times. However, Castree (2003) notes that places are both unique and connected to other places.</td>
</tr>
<tr>
<td>Scale and connection</td>
<td>Discussion of scale (from local to international) is important. However, an appreciation of the connections between scales is also important, e.g., how decisions taken at the local level can have global level, and how decisions of global corporations have differentiated effects in different localities.</td>
</tr>
<tr>
<td>Proximity and distance</td>
<td>Simandan characterises 4 four entangled dimensions of distance: spatial distance; temporal distance; social distance; and hypothetical distance. While distance has long been a central focus for the quantitative, spatial science tradition in geography, Simandan (2016) argues for a reconstruction of distance by subjectifying it, that is, by focusing on the subjective experiencing of distance. Such a reconstruction would align with the centrality of human subjects now core to the practice of human geography.</td>
</tr>
<tr>
<td>Relational thinking</td>
<td>In relation to Said’s (1995) study of Orientalism (1978), relational thinking is the way in which differences and similarities are thought of by contrasting geographies of self and other. Constructions of us and them, self and other, East and West, demonstrate the power relational thinking has on uneven development. “Phase space,” a relational approach to understanding space and place, acknowledges the relational making of space while also acknowledging “the confined, connected, inertial, and always context specific nature of existence and emergence” (Jones, 2009, p. 489).</td>
</tr>
<tr>
<td>Governance and power relations</td>
<td>Governance, politics, and governments are inevitably preoccupied with managing the distributional fall out of fundamental system change, such as typified by process of low-carbon transition or the emergence of marine cluster economies, including the consequences of rising or declining industries, impacts on regions, workers, and owners (Meadowcroft, 2011). There are important overlaps between this theme and the theme of scale also. Scale issues are always important in politics, but that the density of physical and social scales implicated in the constitution and resolution of environmental problems is particularly notable (Meadowcroft, 2002), perhaps even more so in the marine and coastal contexts.</td>
</tr>
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elements of the BE. While the values that underpin some of the current framings of the BE will remain, the problematic nature of arriving at one straightforward definition is subject to change.

4 | MISSING PIECES: THE GEOGRAPHICAL COMPONENTS OF THE BLUE ECONOMY

4.1 | Socio-spatial dimensions of the blue economy

While BE discourse is evolving, many governments, resource users, would-be resources exploiters, and voices of concern for the community and environment are clearly struggling with defining, understanding, and regulating the BE (Lewis, 2019). In examining BE thinking in New Zealand, Lewis (2019) argues that in order for BE thinking to incorporate principles of sustainable development and possibilities for coastal transitions, attention towards a “re-categorisation of economy; new economic objects of concern; and to a potential politics of economic rent and social return” needs to be made (p. 95). In other words, sustainable development and possibilities for coastal transitions will only be achieved by challenging the normative understandings and representations of economy. This can be achieved through disputing and transforming stabilised knowledge and economic relations and by establishing a coherent and direct understanding of economy in relation to economic actors like investors, entrepreneurs, scientists, bankers, policy agencies, consumers, and publics (Lewis, 2019). Therefore, understanding that places and their economies are both unique, and connected to other places (Massey, 1994), while also distinctive through the routes that connect them with other places and times (Castree, 2003), is essential to understanding the appropriate framing for a sustainable BE.

In addition to establishing a coherent understanding of economy, an understanding of place identity, marginality, public engagement (Axon, 2019) and social carrying capacity (Johnson & Hanes, 2019) must be fostered. Aiding transitions to a sustainable development paradigm through public engagement that emphasises local distinctiveness, the subjective experiencing of distance (Simandan, 2016), and how individuals feel attached to places through “personal states of cognitive, affective and behavioural connections” (Axon, 2019, p. 288) will lead to effective public engagement. Such engagement is necessary if not essential for BE that incorporates both sustainability and justice principles. The idea of social carrying capacity is useful here, particularly with regard to its emphasis on the level of development that may or may not be accepted by, or acceptable to, stakeholders. Unacceptable social impacts must also be established in sustainable transitions, as articulated by Johnson and Hanes (2019). Resilience and sustainable development will not work without those who live and work in coastal areas finding agreement among each other on the level of development needed in a given place (Johnson & Hanes, 2019). However, winners and losers are inevitable in any development process. Resulting conflicts about the social acceptance of certain aspects of development must not be understood as homogenous across space, but instead as geographical processes that change through different understandings of economy, local distinctiveness, attachments to places, and ideas of social carrying capacity. Acknowledging these aspects as being fluid across geographic processes will aid in the development of a platform based on “bottom-up” approaches that will lead to effective sustainable development processes that recognise social justice principles.

4.2 | The importance of regions

The existing literature shows a substantial degree of variation when it comes to defining and characterising the economic sectors and the places comprising the BE. As summarised by Voyer et al. (2018), even the conceptualisation of the role of the BE is not uniform among countries and actors.

BE is closely related to the marine economy, although it departs from this latter concept because of its more stringent focus on equity and ecological sustainability (Morrissey, 2017). Defining what comprises the marine economy (or “marine cluster,” depending on the classification method) has also represented a puzzling exercise for
researchers because of the focus institutional and economic structures have on collaborating among different actors related to maritime industries and sea-related activities (Doloreux, 2017). These difficulties emerge from the varying relationships and uses between human systems and natural resources. The same variations leading to the creation of heterogenous seascapes influence researchers and policymakers alike when defining BE from a national perspective.

Variations also occur in the ways in which industries relate with coastal and water environments. For example, the oil and gas sector is often included as part of the BE industries (Voyer et al., 2018). In the North American Great Lakes region, the activities associated with oil and gas are primarily related to the transportation of such resources (via pipeline and train), or to the refining process (Graziano, Gunther, & Lema, 2017). Both groups of industries occur on the coast, in the water, or utilise the freshwater of the Great Lakes as part of their inputs, directly impacting the discourse on ecosystem conservation in the region (Brody, 2012; Leahy, 2017). However, the extractive nature often associated with the industries of this sector does not impact uniformly across large coastal areas. Refineries may have concentrated location-specific impacts, while transport routes may involve the spatial dispersal of varying levels of risk to regional ecosystems. Risk, mitigation, and remediation planning for such extractive industries therefore require a sensitive understanding of place. A regional perspective is essential for this.

In addition, variations occur in governance and policy contexts. Variations are evident in institutional thickness for instance (Zukauskaite, Trippl, & Plechero, 2017) as well as in overlapping, competing, or shared governance jurisdictions. For example, the state of Connecticut is currently developing a BE initiative for Long Island Sound (LIS) through the LIS Blue Plan (DEEP, 2018). LIS, however, is a body of water that is governed by the states of Connecticut, New York, and Rhode Island, which presents problems in properly and effectively implementing a BE policy. In the Irish Sea, the EU, the UK, and Ireland hold jurisdiction. To ensure equilibrium is maintained between multiple governance bodies of one physical body of water, a careful conceptualisation and mapping of the different interests and environmental concerns must be achieved for economic and environmental sustainable development to occur (Ehlers, 2016). In this context, Jay, Ellis, and Kidd (2012) for a more active engagement of natural and social science perspectives to develop effective marine focused spatial strategies.

The varied ways in which BE is depicted by policymakers and researchers can therefore be better understood if studied and implemented from a regional perspective. Regional approaches acknowledge the uniqueness and distinctiveness of places, focus on the subjective experiencing of distance (Simandan, 2016), and recognise the relational making of space (Jones, 2009). An issue of using regional approaches to define BE, however, is the scale at which the region should be conceptualised. In several cases, the jurisdictional powers to regulate the relevant BE sectors may be less clear (Graziano, Billing, et al., 2017), or the socio-economic impacts of policies approved at “regional” level may be felt only locally. To cope with these issues, we need to introduce an additional element for operationalising the BE: scale.

4.3 | Scale mismatches

As a regional development paradigm, BE operates across various scales, from local communities, to transnational seas (Mee, 2012; Silver et al., 2015). Conceptually, “scale” pervades the very foundations of the BE: power relations, political priorities, and the tools utilised to carry out BE-related policies that are mediated by this complex concept (Alexander & Graziano, 2019). Operationalising sustainable coastal transitions within a BE-led regional policy opens the question of the scale at which decisions are taken, tools are designed, and socio-ecological impacts are evaluated. Therefore, the recognition of connections between scales (Jackson, 2006) and politics as the expression of power relations that are the constant companion of socio-technical transitions is needed. The identification of scale in BE impacts on the tools and practices through which this paradigm is practically realised. One of the best-known tools for implementing BE, marine spatial planning (MSP), is dramatically affected by scale mismatches, which are both physical and related to power relations (Alexander & Graziano, 2019). Despite MSP having potential to increase engaged marine management, MSP practice to date has neglected the complexities in “using space as a governance mechanism” (Flannery, Healy, & Luna, 2018, p. 26). MSP, thus far, has increasingly been implemented from “post
political planning, dominated by the logic of neoliberalism with no acknowledgment of power and inequality issues (Flannery et al., 2018, p. 2).

Kerr et al. (2018) have further highlighted how overcoming scale mismatches (there labelled "disparities") is a central element in the implementation of just energy transitions in the coastal zone and present one of the most intractable challenges for social scientists in Europe. Because of the influence of ecosystem-based management in its formulation, BE cannot part from the effects that scale and its mismatches have on the implementation of any transition. As clearly argued by Alexander and Graziano (2019), these mismatches can generate socio-ecological challenges that geographers have encountered and addressed in other contexts and tools already exist for mapping such challenges as well as responses to remediate their effects (O’Higgins, Farmer, Daskalov, Knudsen, & Mee, 2014). Because of its regional nature, the "right" scale for implementing BE as a regional development and a transition paradigm (Geels, 2004, 2011) depends on the locus and the extent to which policies can be applied. For the purpose of this work, we note that the concepts of scale and regionalism, familiar to geographers, have the potential to be fully integrated into transition theory (Coenen, Benneworth, & Truffer, 2012; Morrissey & Heidkamp, 2019; Truffer & Coenen, 2012).

An "Integration Transition Pathway," described by Kelly et al. (2019) offers a promising potential sustainable management approach. Combining a multi-level perspective, a multi-stage concept, and transition management, an "Integration Transition Pathway" recognises individual initiatives as important factors contributing to a wider transition (Kelly et al., 2019). This transition pathway recognises the effects of both scale and region by considering the bottom-up factors that are part of the entire system that is transitioning to a more sustainable paradigm. Of note here is that scale thus takes on more of a relational meaning where different levels of scale are not separate from one another but are interconnected, in effect challenging the notion of hierarchy in scale.

5 | CONCLUSION: TOWARDS JUST TRANSITION(S) OF THE BLUE ECONOMY

This study has sought to identify the geographical concepts underpinning the blue economy. In so doing, we have identified five underpinning concepts which we argue are essential for understanding and addressing uneven development, as the BE is operationalised (e.g., by blue growth policies). The lack of explicit recognition of these elements by policymakers and researchers to date has resulted in three key gaps in current framing, understanding, and application of BE concepts.

(1) Understanding and challenging current power structures are essential for initiating a transition capable of achieving social justice. This represents one of the three key missing pieces from original concepts of the BE. (2) The importance of regions and the need for understanding differences of what the BE is in any given regional context, and therefore how it can be achieved, is the second missing piece. (3) Finally, the role of scale emerges powerfully in the discourse around the BE. The locus of where decisions are taken, and the extents (physical and economic) to which these decisions will impact have to be framed and considered in relation to the socio-ecological "fluidity" of the marine environment. It can be argued that using a just transitions framework (Swilling & Annecke, 2012), which employs social justice and equity as guiding principles along with its practical focus on transdisciplinary (Nicolescu, 2014)—an approach to problem solving that facilitates the co-construction of knowledge among all stakeholders—can do much to address these gaps (Heidkamp & Morrissey, 2019a, 2019b). This clearly responds to Winder and Le Heron’s aforementioned call for increased critical and also practical engagement with the BE and includes an explicit focus on environmental sustainability, and also responds to concerns raised by Barbesgaard (2018) regarding appropriate governance strategies for ocean-related initiatives.

On the premise that persisting or widening inequality is the key factor that needs to be addressed, a just transitions framework—or the related concept of just sustainabilities (Agyeman et al., 2010)—focuses on the integration of social and environmental justice concerns into the sustainability and transitions discourse. Realising that a move
towards more sustainable socio-ecological systems can only be achieved in more equal and cohesive societies (Agyeman, 2013) thus requires not only an analysis of uneven development processes—of the BE—but also an active engagement with "redressing of uneven livelihood possibilities," which is argued by Sheppard (2006, p. 11) to be a core element of economic geography. Any engagement with the blue economy thus also becomes a political project—as Swilling and Annecke (2012 p. XIII) argue:

A Just Transition [towards sustainability], must be a transition that reconciles the sustainable use of resources with a pervasive commitment to what is increasingly referred to as sufficiency (that is, where over-consumers are satisfied with less, so that under-consumers can secure enough, without aspiring for more than their fair share).

Taking a just transitions framework and combining it with ideas for pragmatic blue growth outlined by Burgess et al. (2018) allow for a focus on the nexus of sustainability, environmental justice, and equity in analysing the BE and does set the stage for innovative transdisciplinary participatory action-research approaches. Given the increasing urgency of dealing with environmental pressures (resource exploitation, pollution, and especially climate change) and recognising that any type of transition process towards more sustainable socio-ecological systems has to be considered as a long-term 40-to-50-year process (Swilling & Annecke, 2012), and considering that participatory action research in itself is quite messy and requires long-term community-based engagement, it can be argued that a pragmatic approach to engaging with the BE is our best option. As argued by Heidkamp and Morrissey (2019a, p. 347) regarding coastal sustainability transitions, "we will need to move beyond theoretical discussions and embrace pragmatism as a guiding principle." Thus, the search for a general relevant geographically sensitive definition for the BE is misleading—the BE has to be considered in its regional context, incorporating associated multi-scalar socio-ecological complexities and in the context of wider efforts to achieve a just transition.

ENDNOTE

1 The authors acknowledge focusing the discussion on the UN, EU, and US examples omits research related to the blue economy in the global south. Much of the discussion in this paper is framed in context of an emerging research partnership between Southern Connecticut State University and Liverpool John Moores University, which has a distinct focus on research related to coastal transitions in the global north.

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