

2019

Strategic Environmental Assessment for Marine and Freshwater
Aquaculture Development in South Africa

APPENDIX C-6

Spatial Datasets



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1 SPACIAL INFORMATION USED IN THIS ASSESSMENT

The SEA analyses has made extensive use of data resources arising from the following spatial datasets listed in Table 1 below.

Table 1. Spatial information (datasets) used in this Strategic Environmental Assessment

Feature	Source	Summary
AQUATIC (FRESHWATER) ECOLOGY		
Provincial Conservation Planning	<u>Northern Cape</u> DENC. 2016. Critical Biodiversity Areas of the Northern Cape. http://bgis.sanbi.org/ .	The Northern Cape Critical Biodiversity Area (CBA) Map identifies biodiversity priority areas, called CBAs and Ecological Support Areas (ESAs), which, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape as a whole.
	<u>Western Cape</u> CapeNature. 2017. Western Cape Biodiversity Spatial Plan 2017. http://bgis.sanbi.org/ .	The Western Cape Biodiversity Spatial Plan (WCBSP) is the product of a systematic biodiversity planning assessment that delineates, on a map (via a Geographic Information System (GIS)), CBAs and ESAs which require safeguarding to ensure the continued existence and functioning of species and ecosystems, including the delivery of ecosystem services, across terrestrial and freshwater realms. These spatial priorities are used to inform sustainable development in the Western Cape Province. This product replaces all previous systematic biodiversity planning products and sector plans with updated layers and features.
	<u>Eastern Cape</u> DEDEAT. 2017. Eastern Cape Biodiversity Conservation Plan Handbook. DEDEAT: King Williams Town. Compiled by G. Hawley, P. Desmet and D. Berliner. Draft version, December 2017.	Significant strides have been made with respect to refining the spatial representation of biodiversity pattern and biodiversity processes, as well as establishing standardised minimum requirements for spatial biodiversity planning that ensure a level of consistency throughout the country (SANBI, 2017). The Eastern Cape Biodiversity Conservation Plan (ECBCP) 2017 replaces the ECBCP 2007 in its entirety, and is a tool that guides and informs land use and resource-use planning and decision-making by a full range of sectors whose policies, programmes and decisions impact on biodiversity, in order to preserve long-term functioning and health of priority areas – CBAs and ESAs.
	<u>KwaZulu-Natal</u> Ezemvelo KZN Wildlife. 2016. KwaZulu-Natal Biodiversity Sector Plans. http://bgis.sanbi.org/ .	Critical biodiversity assets in KwaZulu-Natal District Municipalities with associated management guidelines which aim to maintain the integrity of these biodiversity features. The key purpose is to assist and guide land use planners and managers within various district and local municipalities, to account for biodiversity conservation priorities in all land use planning and management decisions, thereby promoting sustainable development and the protection of

		biodiversity, and in turn the protection of ecological infrastructure and associated ecosystem services.
	<u>Mpumalanga</u> MTPA. 2014. Mpumalanga Biodiversity Sector Plan. http://bgis.sanbi.org/ .	Mpumalanga Biodiversity Sector Plan (MBSP) terrestrial assessment is based on a systematic biodiversity planning approach to identify spatial priority areas that meet both national and provincial targets in the most efficient way possible, while trying to avoid conflict with other land-uses. It actively tries to build-in landscape resilience to a changing climate. These spatial priorities are used to inform sustainable development within Mpumalanga. It replaces the MBCPv1 product with updated layers and features. Terminology follows that of South Africa's Biodiversity Act governing the gazetting of Bioregional Plans. A 2010 land-cover map is used based on SPOT5 imagery, as well as old lands mapped of earliest 1: 50 000 topographical maps and earliest suitable Landsat 7 imagery.
	<u>Gauteng</u> GDARD. 2014. Gauteng C-Plan. http://bgis.sanbi.org/ .	The C-Plan serves as the primary decision support tool for the biodiversity component of the Environmental Impact Assessment (EIA) process; informs protected area expansion and biodiversity stewardship programmes in the province; and serves as a basis for development of Bioregional Plans in municipalities within the province.
	<u>North West</u> NW READ. 2015. North West Terrestrial Critical Biodiversity Areas. http://bgis.sanbi.org/ .	A refined and updated CBA map for the North West Province planning domain was developed through integrating existing and new data.
	<u>Free State</u> DESTEA. 2015. Free State Biodiversity Plan. http://bgis.sanbi.org/ .	A key output of the systematic biodiversity planning process is a map indicating CBAs and ESAs. CBAs are areas that are important for conserving biodiversity while ESAs are areas that are important to ensure the long term persistence of species or functioning of other important ecosystems. Degradation of CBAs or ESAs could potentially result in the loss of important biodiversity features and/or their supporting ecosystems.
Protected and Conservation Areas	DEA. 2018a. South African Protected Areas Database (SAPAD). Q2, 2018. https://egis.environment.gov.za/ . DEA. 2018b. South African Conservation Areas Database (SACAD). Q2, 2018. https://egis.environment.gov.za/ .	Protected areas as defined in the National Environmental Management: Protected Areas Act, (Act 57 of 2003) (NEM:PAA). <u>Protected areas:</u> <ul style="list-style-type: none"> • Special nature reserves; • National parks; • Nature reserves; • Protected environments (1-4 declared in terms of the National Environmental Management: Protected Areas Act, 2003); • World heritage sites declared in terms of the World Heritage Convention Act; • Marine protected areas declared in terms of the Marine Living

		<p>Resources Act;</p> <ul style="list-style-type: none"> • Specially protected forest areas, forest nature reserves, and forest wilderness areas declared in terms of the National Forests Act, 1998 (Act 84 of 1998); • Mountain catchment areas declared in terms of the Mountain Catchment Areas Act, 1970 (Act 63 of 1970). <p><u>Conservation Areas:</u></p> <ul style="list-style-type: none"> • Biosphere reserves; • Ramsar sites; • Stewardship agreements (other than nature reserves and protected environments); • Botanical gardens; • Transfrontier conservation areas; • Transfrontier parks; • Military conservation areas; • Conservancies.
National Protected Area Expansion Strategy (NPAES) focus areas	SANParks. 2010. National Protected Areas Expansion Strategy: Focus areas for protected area Expansion. http://bgis.sanbi.org/ .	Focus areas for land-based protected area expansion are large, intact and unfragmented areas of high importance for biodiversity representation and ecological persistence, suitable for the creation or expansion of large protected areas. Representative of opportunities for meeting the ecosystem-specific protected area targets set in the NPAES, and were designed with strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems.
Vegetation of South Africa	SANBI. 2018. Vegetation Map of South Africa, Lesotho and Swaziland. http://bgis.sanbi.org/ .	Update of the Vegetation Map of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006; SANBI, 2012) based on decisions made by the National Vegetation map Committee and contributions by various partners.
Threatened ecosystems	DEA. 2011. South African Government Gazette. National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection. Government Gazette, 558(34809). http://bgis.sanbi.org/ .	The Biodiversity Act (Act 10 of 2004) provides for listing of threatened or protected ecosystems, in one of four categories: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or protected. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems. The purpose of listing protected ecosystems is primarily to preserve sites of exceptionally high conservation value.
National Land Cover	Geoterraimage. 2015. 2013-2014 South African National Land-Cover. Department of Environmental Affairs. Geospatial Data. https://egis.environment.gov.za/ .	Recent global availability of Landsat 8 satellite imagery enabled the generation of new, national land-cover dataset ¹ for South Africa, circa 2013-14, replacing and updating the previous 1994 and 2000 South African National Landcover

		<p>datasets. The 2013-14 national land-cover dataset is based on 30x30m raster cells, and is ideally suited for ± 1:75,000 - 1:250,000 scale GIS-based mapping and modelling applications.</p> <p>Land cover are categorised into different classes, which broadly include:</p> <ul style="list-style-type: none"> • Bare none vegetated • Cultivated • Erosion • Grassland • Indigenous Forest • Low shrubland • Mines/mining • Plantation • Shrubland fynbos • Thicket /Dense bush • Urban • Water • Woodland/Open bush
Ecoregions	Burgess <i>et al.</i> 2004. Terrestrial ecoregions of Africa and Madagascar: A conservation Assessment. Island Press: Washington DC. Geospatial data by SANBI.	Biodiversity patterns, threats to biodiversity, and resulting conservation priorities of biological units (rather than political units).
SQ4 sub-quaternary drainage regions (referred to as SQ4 catchments)	DWS. 2009. Working copies of sub-quaternary catchments for delineation of management areas for the National Freshwater Ecosystem Priority Areas (NFEPA) in South Africa project - 2009 draft version. http://www.dwa.gov.za/iwqs/gis_data/ .	Catchment areas that define the drainage regions of the NEFPA river reaches, which include 9 433 catchments ranging from 0.25 to 400 000 hectares. The gas pipeline corridors include 4 843 SQ4 catchments ranging from 0.1 to 115 000 hectares. These catchment areas are used as the primary spatial unit for analysis in the freshwater component.
River Ecoregions (Level 1 and 2)	Kleynhans, C.J., Thirion, C. & Moolman, J., 2005. A level I river ecoregion classification system for South Africa, Lesotho and Swaziland. Pretoria: Department of Water Affairs and Forestry.	A delineation of ecoregions for South Africa as derived from terrain, vegetation, altitude, geomorphology, rainfall, runoff variability, air temperature, geology and soil. There are 31 Level 1 and 219 Level 2 River Ecoregions in South Africa, of which 25 Level 1 and 97 Level 2 River Ecoregions occur within the gas pipeline corridors.
River Present Ecological State (PES), Ecological Importance (EI) and Ecological Sensitivity (ES)	DWS. 2014. A Desktop Assessment of the Present Ecological State, Ecological Importance and Ecological Sensitivity per Sub Quaternary Reaches for Secondary Catchments in South Africa. https://www.dwa.gov.za/iwqs/rhp/eco/peseismodel.aspx .	A Desktop Assessment of the Present Ecological State, Ecological Importance and Ecological Sensitivity per Sub Quaternary Reaches for Secondary Catchments in South Africa conducted in 2013.
NFEPA Rivers and	Nel, J.L., Murray, K.M., Maherry, A.M., Petersen, C.P., Roux,	The NFEPA coverages provide specific spatial information for rivers according to

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Wetlands	D.J., Driver, A., Hill, L., Van Deventer, H., Funke, N., Swartz, E.R., Smith-Adao, L.B., Mbona, N., Downsborough, L. and Nienaber, S. 2011. Technical Report for the National Freshwater Ecosystem Priority Areas project. Pretoria: Water Research Commission, WRC Report No. K5/1801. http://bgis.sanbi.org/ .	the DWS 1:500 000 rivers coverage, including river condition, river ecosystem types, fish sanctuaries, and flagship/free-flowing rivers. The NFEPA coverages also provide specific information for wetlands such as wetland ecosystem types and condition (note: wetland delineations were based largely on remotely-sensed imagery and therefore did not include historic wetlands lost through transformation and land use activities).
Wetlands	Van Deventer, H., Smith-Adao, L., Collins, N.B., Grenfell, M., Grundling, A., Grundling, P-L., Impson, D., Job, N., Lötter, M., Ollis, D., Petersen, C., Scherman, P., Sieben, E., Snaddon, K., Tererai, F and Van der Colff, D. 2019. South African National Biodiversity Assessment 2018: Technical Report. Volume 2: Inland Aquatic (Freshwater) Realm. CSIR report number CSIR/NRE/ECOS/IR/2019/0004/A. South African National Biodiversity Institute, Pretoria. http://bgis.sanbi.org/ .	Updated wetlands data, which was sourced from the National Biodiversity Assessment 2018, was used to update the environmental sensitivity maps during the rework of the Freshwater Specialist Assessment Report in September/October 2019.
Ramsar Sites	Ramsar Convention. 1971. Convention on Wetlands of International Importance especially as Waterfowl Habitat. https://www.ramsar.org/	Distribution and extent of areas that contain wetlands of international importance in South Africa.
Dams	Department of Water and Sanitation (DWS) (2005) and as updated by the National Freshwater Ecosystem Priority Area (NFEPA) study at 1:250 000 scale. http://www.dwaf.gov.za/iwqs/gis_data/river/rivs500k.aspx	Dams of South Africa managed by the National Department of Water and Sanitation (DWS).
Irrigated lands	Department of Agriculture, Forestry and Fisheries (DAFF). 2013.	Crop field boundaries digitized from satellite imagery at 1:20 000. Irrigated land extracted.
	GEOTERRAIMAGE (DEA Open Access). 2015.	Irrigated crop boundaries were augmented with the latest 2013-2014 National Land Cover Data set.
Slope	United States Geological Survey (USGS). 2015.	Steep slopes exceeding 10 % derived from Digital Elevation Model at 1:30 scale
National Wetland Vegetation Groups	Nel, J.L. and Driver, A. 2012. South African National Biodiversity Assessment 2011: Technical Report. Volume 2: Freshwater Component. Stellenbosch: Council for Scientific and Industrial Research. CSIR Report Number: CSIR/NRE/ECO/IR/2012/0022/A.	A vector layer developed during the 2011 NBA to define wetland vegetation groups to classify wetlands according to Level 2 of the national wetland classification system (SANBI, 2010). The wetland vegetation groups provide the regional context within which wetlands occur, and is the latest available classification of threat status of wetlands that are broadly defined by the associated wetland vegetation group. This is considered more practical level of classification to the Level 4 wetland types owing to the inherent low confidence in the desktop classification of hydrogeomorphic units (HGM) that was used at the time of the 2011 NBA.
SUPPLEMENTARY FISH DATA		
IUCN Fish Data	IUCN. 2017. The IUCN Red List of Threatened Species,	Distribution data for selected fish species where point data was found to be

	2017. http://www.iucnredlist.org/	lacking/insufficient was obtained from the IUCN Red List of Threatened Species Map Viewer with data presented as catchment distributions.
SANBI Fish Data	SANBI. 2018. Supplementary fish species: Threatened taxa. http://speciesstatus.sanbi.org/taxa/lineage/538/ .	Supplementary fish species data provide lists of fish species of conservation concern including level of endemism, protection, vulnerability and ecological sensitivity in South Africa.
MPTA Fish Data	Mpumalanga Parks and Tourism Agency. 2017. Supplementary Data / Fish Species of Concern.	Supplementary fish species data provide lists of fish species of conservation concern including level of endemism, protection, vulnerability and ecological sensitivity in the Mpumalanga Province.
SKEP Fish Data	Succulent Karoo Ecosystem Plan. 2011. Supplementary Data / Fish Species of Concern	Supplementary fish species data provide lists of fish species of conservation concern including level of endemism, protection, vulnerability and ecological sensitivity in the Succulent Karoo Biome.
ECape Fish – MARXAN	Eastern Cape. 2017. Supplementary Data / Excel spreadsheet with sites and SQHASH links.	Supplementary fish species data provide lists of fish species of conservation concern including level of endemism, protection, vulnerability and ecological sensitivity in the Eastern Cape Province.
MARINE BIODIVERSITY AND ECOLOGY		
Formally Marine Protected Areas	Sink, K.J., Van der Bank, M.G., Majiedt, P.A., Harris, L., Atkinson, L., Kirkman, S. and Karenzi, N. (Eds). 2019. South African National Biodiversity Assessment 2018: Technical Report. Volume 4: Marine Realm. South African National Biodiversity Institute, Pretoria. http://bgis.sanbi.org/ .	Marine, estuarine and terrestrial areas within the study area boundaries that are under formal protection.
Estuarine health	Van Niekerk, L., Adams, J.B., Lamberth, S.J., MacKay, F., Taljaard, S., Turpie, J.K., Weerts, S. and Raimondo, D.C. 2019. South African National Biodiversity Assessment 2018: Technical Report. Volume 3: Estuarine Realm. South African National Biodiversity Institute, Pretoria. http://bgis.sanbi.org/ .	Assessment of the state of South Africa’s estuarine biodiversity based on best available science, with a view to understanding trends over time and informing policy and decision-making. Although this assessment does not consider mariculture activities in estuaries, impacts on the marine environment adjacent to these systems can result in detrimental effects through their connectivity with the sea. Thus estuaries (as demarcated by estuarine functional zones) are included as a sensitivity category in this assessment to caution against development in marine areas immediately adjacent to estuary mouths (i.e. development buffer zones).
	Van Niekerk, L. et al. 2013. Country-wide assessment of estuary health: An approach for integrating pressures and ecosystem response in a data limited environment. <i>Estuarine, Coastal and Shelf Science</i> , 130: 239-251.	A country-wide assessment of the ~300 functional South African estuaries examined both key pressures (freshwater inflow modification, water quality, artificial breaching of temporarily open/closed systems, habitat modification and exploitation of living resources) and health status.
Estuary ecological classification	Van Niekerk, L. et al. 2015. Desktop Provisional EcoClassification of the Temperate Estuaries of South Africa. Water Research Commission Report No K5/2187.	EcoClassification for estuaries that provided a comparative, regional scale assessment. The Provisional EcoClassification refers to the Present Ecological Status (PES), the ecological importance and protection status, a Provisional Recommended Ecological Category (REC), as well as mitigation

		measures towards achieving the Provisional REC.
Estuaries in Formally /desired protected areas	Van Nieker, L., Adams, J.B., Lamberth, S.J., MacKay, F., Taljaard, S., Turpie, J.K., Weerts, S. and Raimondo, D.C. 2019. South African National Biodiversity Assessment 2018: Technical Report. Volume 3: Estuarine Realm. South African National Biodiversity Institute, Pretoria. http://bgis.sanbi.org/ .	Marine, estuarine and terrestrial areas that are under formal protection or estuaries identified as desired protected areas in the National Estuaries Biodiversity Plan.
Estuaries of high biodiversity importance	Van Nieker, L., Adams, J.B., Lamberth, S.J., MacKay, F., Taljaard, S., Turpie, J.K., Weerts, S. and Raimondo, D.C. 2019. South African National Biodiversity Assessment 2018: Technical Report. Volume 3: Estuarine Realm. South African National Biodiversity Institute, Pretoria. http://bgis.sanbi.org/ .	In South Africa, estuary biodiversity importance is based on the importance of an estuary for plants, invertebrates, fish and birds, using rarity indices. The Estuary Importance Rating takes size, the rarity of the estuary type within its biographical zone, habitat and the biodiversity importance of the estuary into account.
Important nurseries	Van Niekerk, L. et al. 2017. A multi-sector Resource Planning Platform for South Africa's estuaries. Water Research Commission Report No K5/2464.	Estuaries that are critically important nursery areas for fish and invertebrates and make an important contribution towards estuarine and coastal fisheries.
Important estuarine habitats, including natural or near natural condition estuaries	Lamberth, S.J. & Turpie, J.K. 2003. The role of estuaries in South African fisheries: economic importance and management implications. African Journal of Marine Science, 25: 131-157.	Estuaries that support important rare or sensitive habitats (saltmarsh, mangroves, swamp forest) that provide important ecosystem services. Estuaries in good condition (designated by an A or B health category) are more sensitive to development (likely to degrade in overall condition).
Fluvially-derived banks	Weerts, S., Taljaard, S., Carter, R., Pulfrich, A., Van Ballegooyen, R., Van Nieker, L. and Ramjukadh, C-L. 2017. Fluvially-derived banks: Estimated Areas (Generated polygon data). Council for Scientific and Industrial Research, Stellenbosch.	Fluvially-derived banks and plumes typically develop in the marine environment where large rivers deliver high sediment loads to the coast. These banks and plumes fulfil an important ecological role as unique habitats in South African marine areas, as refugia for estuarine biota during times of high flow, and in providing cues for estuarine recruitment. These areas are characterised by fine sediments and are therefore prone to sediment quality impacts. Because plumes are important habitats (e.g. turbid, nutrient rich areas) for certain biota, they are also included here.
Aggregation areas for important marine species	Department of Environmental Affairs. 2017. National Oceans and Coastal Information Management System (OCIMS). https://ocims-dev.dhcp.meraka.csir.co.za/dea-coastal-viewer/ https://www.ocims.gov.za/dataset/seal-colonies1	Areas where important marine fauna aggregate include significant breeding, nursery and feeding sites for marine biota (e.g. seals, penguins, Cape gannets), cetaceans (dolphins, whales), sharks, or rare and over-exploited species. For this assessment large seal and penguin colonies, as well as islands are used as key indicators of aggregation areas.
Important fishery nurseries	CSIR Generated point data based on: Sink, K.J., Van der Bank, M.G., Majiedt, P.A., Harris, L., Atkinson, L., Kirkman, S. and Karenji, N. (Eds). 2019.	Estuaries and adjacent marine areas that are important nursery areas for fish and shellfish populations, and which support fisheries.

	South African National Biodiversity Assessment 2018: Technical Report. Volume 4: Marine Realm. South African National Biodiversity Institute, Pretoria. http://bgis.sanbi.org/ .	
Critically endangered habitats	Sink, K., Holness, S., Harris, L., Majiedt, P., Atkinson, L., Robinson, T., Kirkman, S., Hutchings, L., Leslie, R., Lamberth, S.J., Kerwath, S., Von der Heyden, S., Lombard, A., Attwood, C., Branch, G., Fairweather, T., Taljaard, S., Weerts, S., Cowley, P., Awad, A., Halpern, B., Grantham, H. and Wolf. T. 2011. South African National Biodiversity Assessment 2011: Technical Report. Volume 4: Marine and Coastal Component. South African National Biodiversity Institute, Pretoria. http://bgis.sanbi.org/ .	Natural habitats identified as being critically endangered.
Endangered habitats	Sink, K., Holness, S., Harris, L., Majiedt, P., Atkinson, L., Robinson, T., Kirkman, S., Hutchings, L., Leslie, R., Lamberth, S.J., Kerwath, S., Von der Heyden, S., Lombard, A., Attwood, C., Branch, G., Fairweather, T., Taljaard, S., Weerts, S., Cowley, P., Awad, A., Halpern, B., Grantham, H. and Wolf. T. 2011. South African National Biodiversity Assessment 2011: Technical Report. Volume 4: Marine and Coastal Component. South African National Biodiversity Institute, Pretoria. http://bgis.sanbi.org/ .	Natural habitats identified being endangered.
Vulnerable habitats	Sink, K., Holness, S., Harris, L., Majiedt, P., Atkinson, L., Robinson, T., Kirkman, S., Hutchings, L., Leslie, R., Lamberth, S.J., Kerwath, S., Von der Heyden, S., Lombard, A., Attwood, C., Branch, G., Fairweather, T., Taljaard, S., Weerts, S., Cowley, P., Awad, A., Halpern, B., Grantham, H. and Wolf. T. 2011. South African National Biodiversity Assessment 2011: Technical Report. Volume 4: Marine and Coastal Component. South African National Biodiversity Institute, Pretoria. http://bgis.sanbi.org/ .	Natural habitats identified as being vulnerable.
Least threatened habitats	Sink, K., Holness, S., Harris, L., Majiedt, P., Atkinson, L., Robinson, T., Kirkman, S., Hutchings, L., Leslie, R., Lamberth, S.J., Kerwath, S., Von der Heyden, S., Lombard, A., Attwood, C., Branch, G., Fairweather, T., Taljaard, S., Weerts, S., Cowley, P., Awad, A., Halpern, B., Grantham, H. and Wolf. T. 2011. South African National Biodiversity Assessment 2011: Technical Report. Volume 4: Marine and Coastal Component. South African National Biodiversity Institute, Pretoria. http://bgis.sanbi.org/ .	Natural habitats identified as being least threatened.

	Coastal Component. South African National Biodiversity Institute, Pretoria. http://bgis.sanbi.org/ .	
Mean annual Sea Surface Temperature	NASA Ocean Biology (OB.DAAC). 2014. Mean annual sea surface temperature for the period 2009-2013 (composite dataset created by UNEP-WCMC). Data obtained from the Moderate Resolution Imaging Spectro-radiometer (MODIS) Aqua Ocean Colour website (NASA OB.DAAC, Greenbelt, MD, USA). Accessed 28/11/2014. URL: http://oceancolor.gsfc.nasa.gov/cgi/l3 . Cambridge (UK): UNEP World Conservation Monitoring Centre. URL: http://data.unep-wcmc.org/datasets/36 .	Mean sea surface temperature globally from 2009 to 2013. The dataset was created using remotely-sensed MODIS Aqua data from NASA's (National Aeronautics and Space Administration) Ocean Color database.
Extreme waves	CSIR coastal vulnerability study. 2014.	Mean height of 1:1 year extreme waves at 15 m depth contour. Digitised as sections along the coast at 1:5 000 scale.
MARINE SOCIO-ECONOMICS		
Coastal town and cities	Council for Scientific and Industrial Research: General layer generated. 2017.	Location of coastal towns and cities along South Africa's coast.
Important recreational areas	Department of Environmental Affairs. 2017. National Oceans and Coastal Information Management System (OCIMS). https://ocims-dev.dhcp.meraka.csir.co.za/dea-coastal-viewer/	Areas where direct use is made of coastal waters for recreational purposes. These include Blue Flag beaches which are places designated and valued as safe and clean swimming areas and popular diving sites. These areas generate (either directly or indirectly) tourism income for local municipalities and mariculture impacts may result in loss of revenue. Issues relate to aesthetics, water quality and competition for space.
Commercial ports	CSIR Generated point data based on: Department of Environmental Affairs. 2017. National Oceans and Coastal Information Management System (OCIMS). https://ocims-dev.dhcp.meraka.csir.co.za/dea-coastal-viewer/	Location of South Africa's commercial ports along the South African coastline.
Fishing harbours and other small harbours including public launch sites	CSIR Generated point data based on: Department of Environmental Affairs. 2017. National Oceans and Coastal Information Management System (OCIMS). https://ocims-dev.dhcp.meraka.csir.co.za/dea-coastal-viewer/	Fishing and small harbours (e.g. yacht harbours) provide opportunity for mariculture (e.g. sheltered waters and proximity of land and infrastructure for processing and dispatching of products), but mariculture development can result in competition for space with harbour activities, as well as other activities to harbours.
Existing marine aquaculture facilities	CSIR Generated point data based on: Department of Agriculture, Forestry and Fisheries. 2017. Marine Rights Register. Aquaculture and Economic Development, Cape Town.	Location of existing marine aquaculture facilities along the South African coastline.

ARCHAEOLOGY, PALAEOLOGY AND CULTURAL HERITAGE		
Shipwrecks	Generated point data obtained from: http://www.wrecksite.eu/wrecksite.aspx	Location of shipwrecks along the South African coastline.
Palaeontology	1:1000000 Geological Map of South Africa. 2011. Council for Geoscience.	Palaeontological resources are “fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace”, while meteorites are described as “any naturally-occurring object of extraterrestrial origin”.
Archaeology and Cultural Heritage	South African Heritage Resources Information System (SAHRIS). 2017. South African Heritage Resources Agency, Cape Town. https://sahris.sahra.org.za/ .	The SAHRIS database contains a collection of archaeological and palaeoanthropological sites and resources, including records of artefacts and heritage objects, rock art, burial grounds and graves, built heritage and cultural landscapes that form part of the Naitonal Estate.
VISUAL, AESTHETIC AND SCENIC RESOURCES		
Geology	1:1000000 Geological Map of South Africa. 2011. Council for Geoscience.	Geological information of South Africa.
Topography	1:500 000 topographical maps of South Africa.	Topographical information of South Africa.
National Parks, Reserves and Protected Areas	DEA. 2017a. South African Protected Areas Database (SAPAD). Q3, 2017. https://egis.environment.gov.za/ . DEA. 2017b. South African Conservation Areas Database (SACAD). Q3, 2017. https://egis.environment.gov.za/ .	a) South African Protected Areas Database (SAPAD). b) South African Conservation Areas Database (SACAD).
Heritage and Scenic Resources: Western Cape	Winter and Oberholzer. 2013. For the Department of Environmental Affairs and Development Planning (DEA&DP), Provincial Government of the Western Cape.	Heritage and Scenic Inventory and Policy Framework for the Western Cape: Survey and rating of heritage and scenic resources in Western Cape.
Cities, towns, settlements and municipal areas	AfriGIS. 2013. Data provided by CSIR and SANBI.	Location of South African Cities, towns, settlements and municipal areas.
National, Provincial and Regional roads and tracks	Open Street Map (OSM) South African Roads and Railways. 2017. www.openstreetmap.org	Location of South African Roads and Railways.
Socio-Economic Resources		
Socio-economic Intensity Index	Ngidi, M. and Van Huyssteen, E. 2017. Methodological Report for Socio-economic profiles to inform the identification of Renewable Energy Development Zones (REDZs) in support of the Phase 2 Wind and Solar Strategic Environmental Assessment, CSIR Built Environment. CSIR	Ngidi and van Huyssteen (2017) compiled a Socio-economic Intensity Index for municipalities in South Africa. A parameter that informed the index was the Gross Value Added (GVA) to determine the economic output of each municipality. The GVA used within the index was calculated based on the Real GVA at basic prices (in Rand millions) at 2010 prices to ensure temporal

	Report number: CSIR/IU/021MH/IR/2017/0012/B.	comparability and the weighted GVA growth between 2011 and 2016 of each municipality, compared with the national absolute growth of 7.8%. The latter was used to compare the growth of one municipality in relation to other municipalities.
Social Vulnerability Index	Le Roux, A. and Naudé, A. 2014. CSIR Regional Dynamics and Interactions Analyses Note: Social Vulnerability – Locating South Africa’s vulnerable people. Available on: www.Stepsa/regionaldynamics.org.za .	Le Roux and Naudé (2014) created a Social Vulnerability Index to support national decision-makers in South Africa. The indicators that form part of the Social Vulnerability Index include for example average household size, Percentage of the population that is unemployed, Percentage of households without public water, etc. Since the Social Vulnerability Index comprises 14 indicators, it is the composite of these indicators that allocate a vulnerability value to an area and not one single factor. The profiling of vulnerable communities is seen as the first step to plan for resilient communities, i.e. determining how vulnerable is a community or group of people within a generic framework of multiple stressors. Social vulnerability can therefore be considered as the “inability of people, settlements and societies to withstand or adapt to the impact of multiple stressors such as disruptive natural or manmade events”