

Marine Aggregates

Annual Review 2026



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National overview

Why are marine aggregates important to Britain?

Britain has one of the world’s most developed marine aggregate industries, extracting 15 to 20 million tonnes from the seabed annually. Much of this is used for building houses, transport infrastructure, replenishing beaches and improving coastal defences.

Onshore resources are becoming increasingly constrained, particularly in the South East of England and London. In 2018, marine aggregates satisfied 22% (13.7 million tonnes) of the total construction needs for sand and gravel in Great Britain*

The Crown Estate owns almost all of the sand and gravel resources lying off of the coast of England, Wales and Northern Ireland and we award and manage commercial agreements for companies to extract it.

This document is designed to help planning officers in local authorities understand the contribution that marine aggregates can make, by identifying offshore sources and providing information on supply routes. In turn, this is intended to support local authorities in complying with the National Planning Policy Framework, which requires mineral planning authorities to demonstrate they have a steady and adequate supply of aggregates for their requirements through Local Aggregates Assessments.

Unless otherwise stated, all figures in this document are correct as of April 2026.

The seven dredge regions marine aggregate is sourced from.

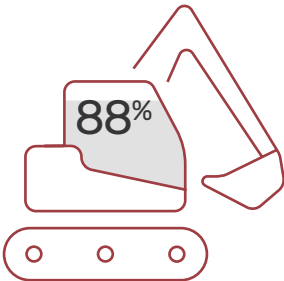
Note that dredging does not currently occur in Northern Ireland. Scotland is the responsibility of Crown Estate Scotland.



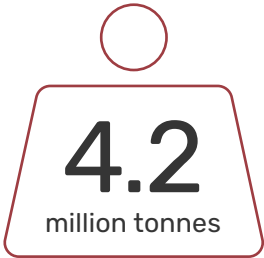
* Source: Mineral Products Association: Profile of the UK Mineral Products Industry 2020 Edition



There is potential for demand to increase to **29 million tonnes** per year by **2030**



88% of marine aggregates landed in England and Wales are used by the **building industry**



4.2 million tonnes of marine aggregate was exported to **Europe** in 2025 (**23%** of all marine aggregate landed)

Sustainability and stewardship



The Crown Estate has a commitment to being a responsible landlord, which includes minimising the impact that marine aggregate dredging has on the natural environment, helping local communities and preserving archaeological finds.

Although the quantity of sand and gravel potentially available from marine sources is vast, the industry is aware that it is extracting from a large but ultimately finite natural mineral resource and is keen to ensure that these valuable minerals are used in the most efficient and effective manner possible.

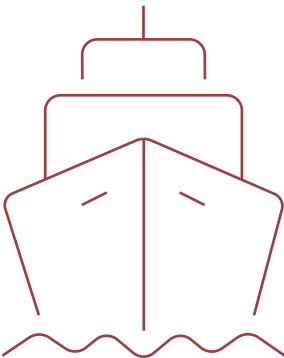
We work in partnership with industry, regulators and stakeholders to improve the sustainability of the sector, in particular reducing the area of seabed licensed that is dredged year on year.

Via our Electronic Monitoring System, we ensure all dredging is undertaken in the correct locations, and every licence application must be supported by a full Environmental Impact Assessment including a Coastal Impact Study to determine whether a marine licence (essentially the planning consent) can be granted, a process governed by the Marine Licensing process.

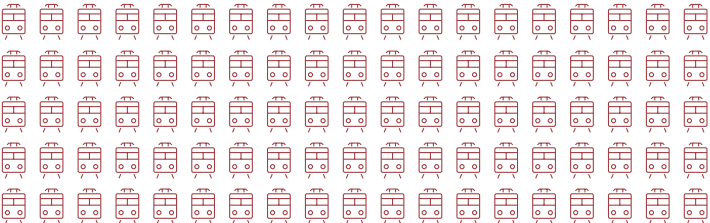
To deliver 8,500 tonnes takes:

1 dredger

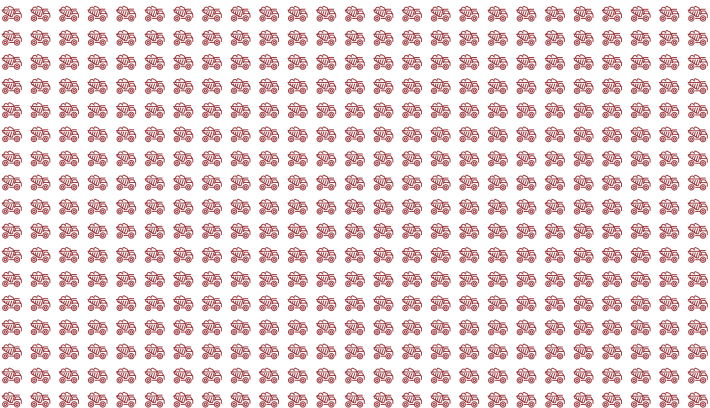
(of 8,500 tonnes)



95 train hopper wagons
(of 90 tonnes)

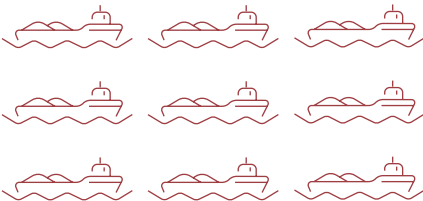


425 aggregate lorries
(of 20 tonnes)



9 barges

(of 1,000 tonnes)



Reserves and resources

Reserves and resources

The PERC code defines “**reserves**” as the proportion of a mineral “**resource**” that can be mined for economic purposes

22

Current national estimates suggest there are **22 years** of primary marine aggregate production permitted

373

million tonnes

Estimated national total current primary reserves

Region	Total current primary reserves	10-year average annual offtake*	3-year average annual offtake*	Peak annual offtake during 10-year period*	Annual permitted offtake (as March 2026)	Regional reserve life at 10-year average annual offtake
		Primary (construction aggregate)				
Humber	27.81	3.03	3.35	3.69	6.88	9.18
East Coast	35.27	3.62	3.19	4.31	6.13	9.74
Thames Estuary	33.11	1.62	1.56	1.94	3.20	20.45
East English Channel	183.43	4.09	3.61	4.65	12.07	44.84
South Coast	60.52	3.60	3.86	4.02	7.48	16.79
South West	24.31	1.32	1.31	1.43	2.80	18.49
North West	8.32	0.24	0.22	0.32	0.90	34.24
Total	372.78	17.53	17.09	18.10	39.46	21.27

All figures are in millions of tonnes
Totals are national averages and peaks, not the sum of regional figures



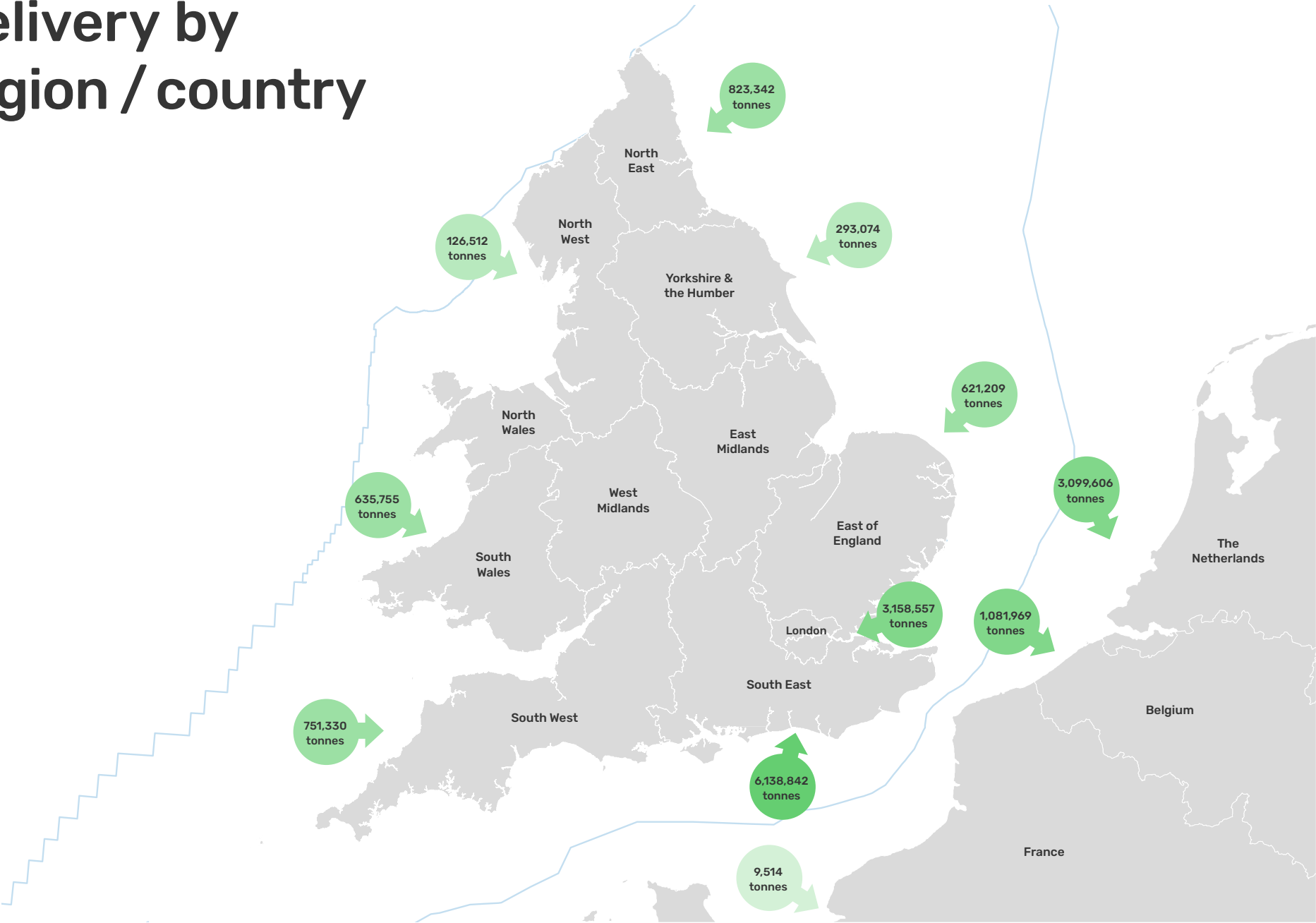
252

million tonnes

London and the Thames Estuary are supplied by the East Coast, Thames Estuary & East English Channel. These hold consented reserves of 252m tonnes, giving **London** and the **Thames Estuary** 23 years of production*

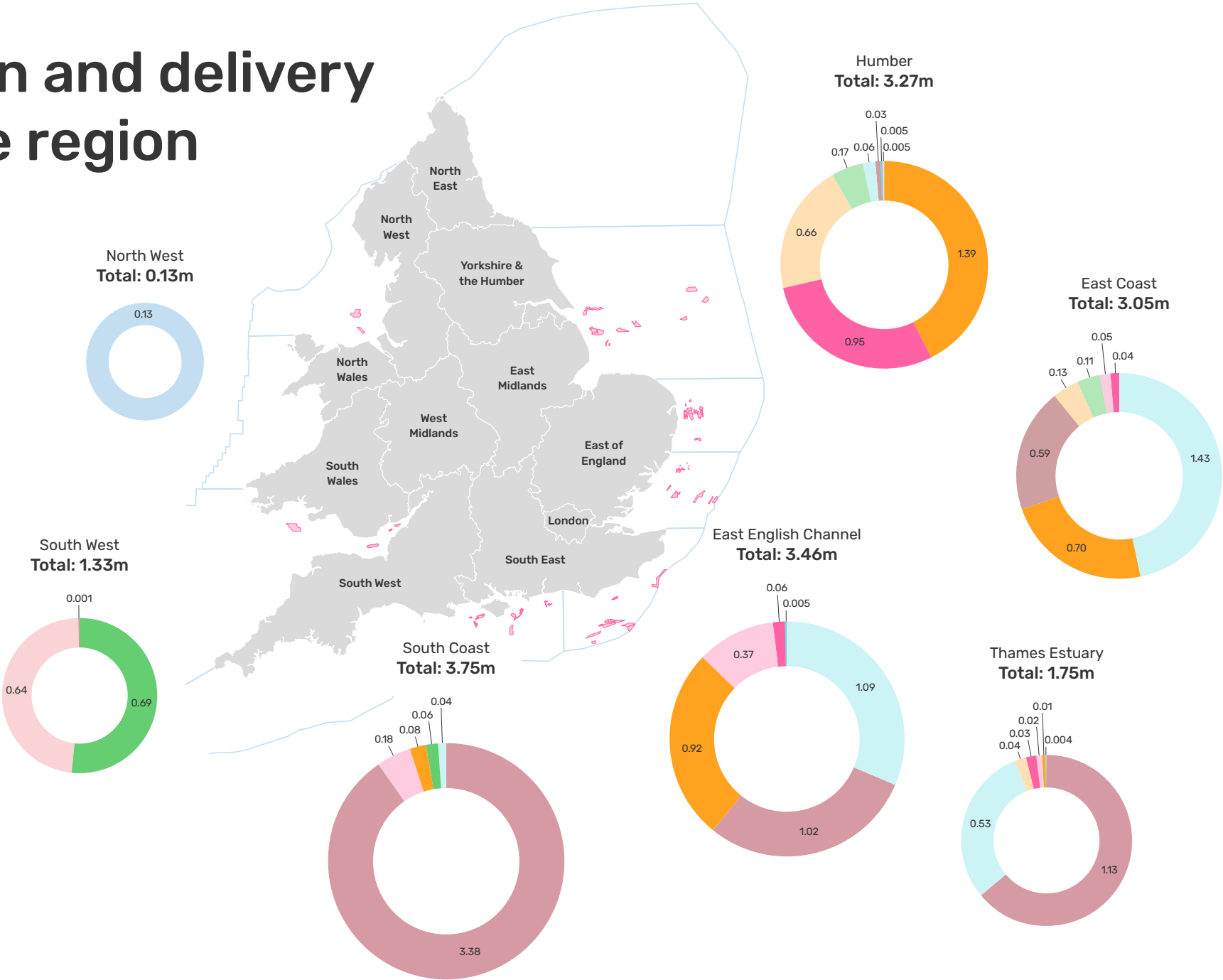
* Based on 10 year annual offtake

Delivery by region / country



Extraction and delivery by dredge region

- Belgium
- East of England
- France
- London
- The Netherlands
- North East
- North Wales
- North West
- South East
- South Wales
- South West
- Yorkshire & Humber



The Humber region

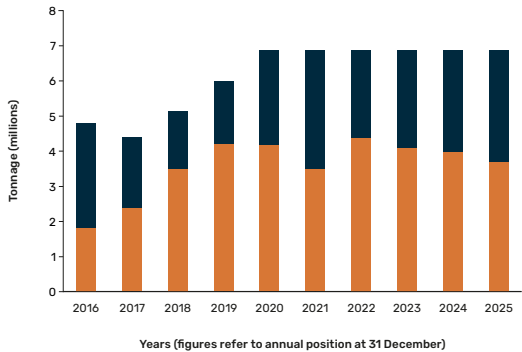
6.9
million tonnes can be extracted
from 9 licences annually

9
Current estimates suggest there
are 9 years of primary marine
aggregate production permitted

5
applications for licences could, if
approved, increase the permitted
tonnage by 5.8 million tonnes

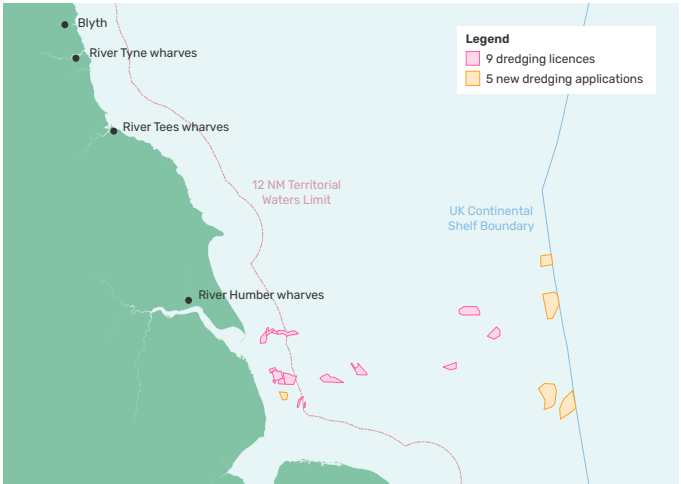
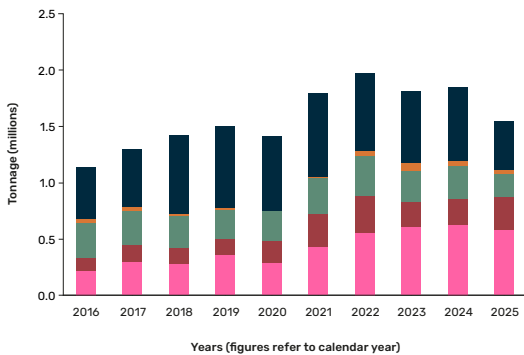
Permitted and
extracted tonnage

Unused permitted tonnage
Extracted tonnage



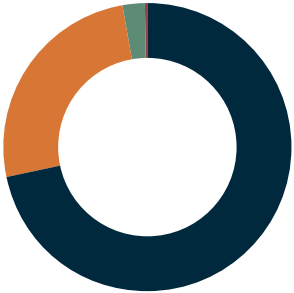
Delivery of marine
aggregate to the region

- Secondary use from licences
- Blyth
- River Tyne wharves
- River Humber wharves
- River Tees wharves

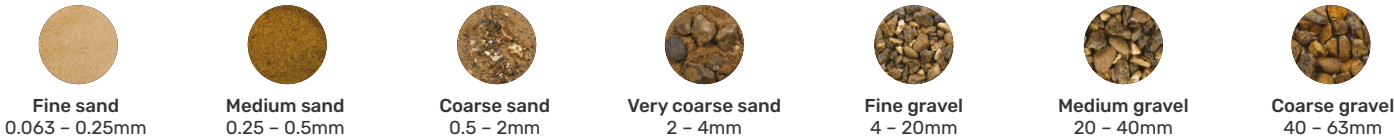


During 2025 material
extraction from the region
was mainly delivered to:

- Mainland Europe (71.8%)
- Humber (Inc. North East) (25.5%)
- Thames Estuary (2.5%)
- South Coast (0.2%)



Sediment and indicative grain sizes



The East Coast region

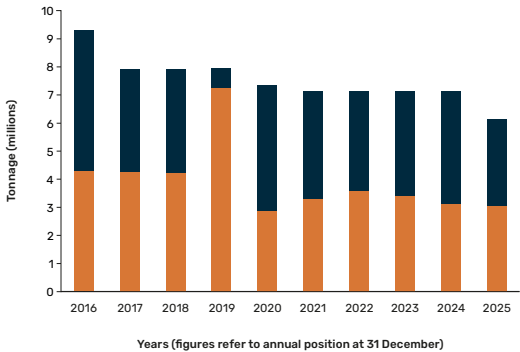
6.1
million tonnes can be extracted
from 12 licences annually

10
Current estimates suggest there
are 10 years of primary marine
aggregate production permitted

0
There are currently no applications
in the East Coast region

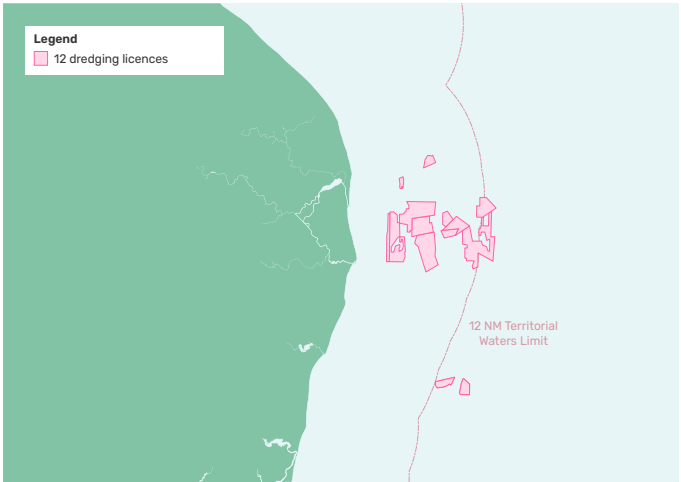
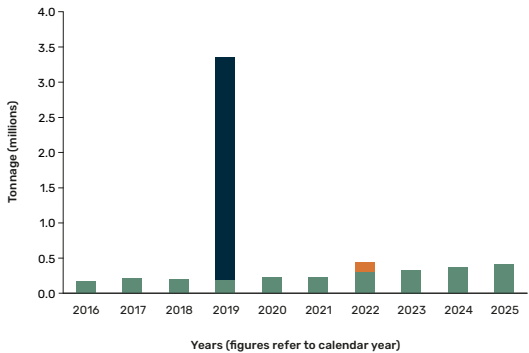
Permitted and
extracted tonnage

- Unused permitted tonnage
- Extracted tonnage



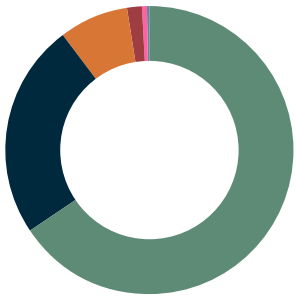
Delivery of marine
aggregate to the region

- Secondary use from licences
- East Coast Marine Aggregates
- Ipswich

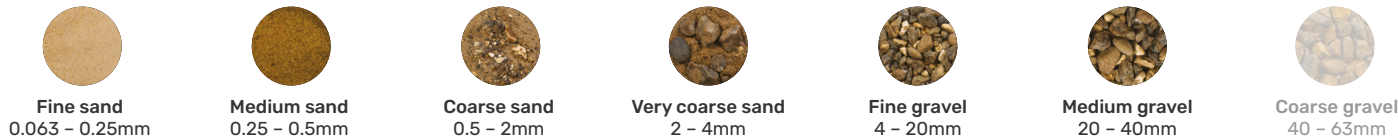


During 2025 material
extraction from the region
was mainly delivered to:

- Thames Estuary (65.8%)
- Mainland Europe (24.2%)
- Humber (Inc. North East) (7.9%)
- South Coast (1.6%)
- East Coast (0.3%)
- East English Channel (0.1%)



Sediment and indicative grain sizes



The Thames region

3.2

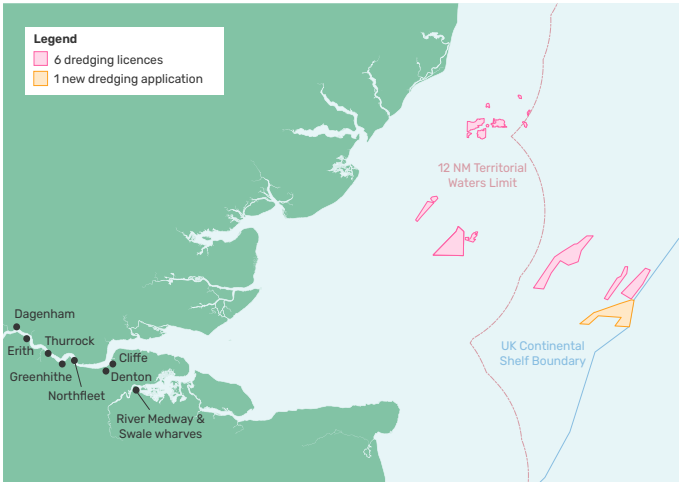
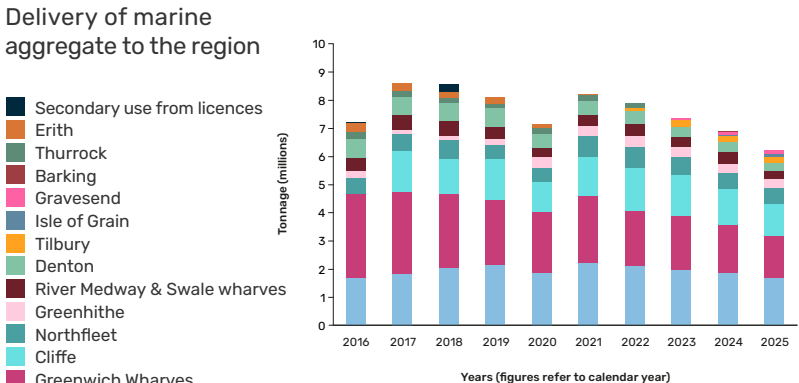
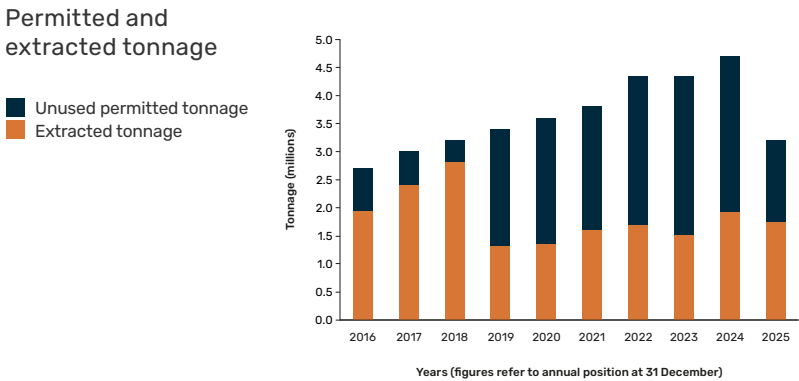
million tonnes can be extracted from 6 licences annually

20

Current estimates suggest there are 20 years of primary marine aggregate production permitted

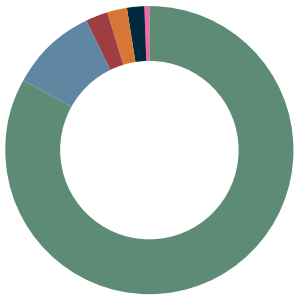
1

application for a licence could, if approved, increase the permitted tonnage by 0.7 million tonnes

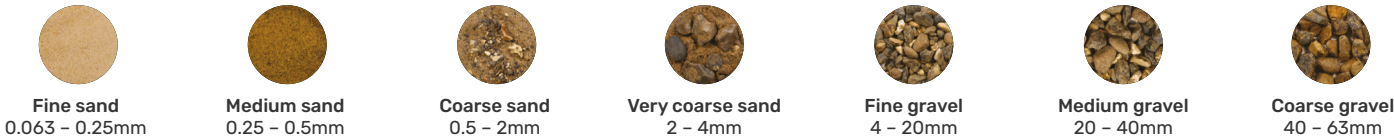


During 2025 material extraction from the region was mainly delivered to:

- Thames Estuary (83%)
- East English Channel (9.9%)
- South Coast (2.4%)
- Humber (Inc. North East) (2.2%)
- Mainland Europe (1.9%)
- East Coast (0.5%)



Sediment and indicative grain sizes



The East English Channel region

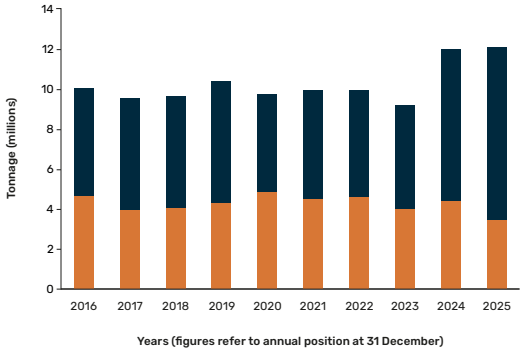
12.1
million tonnes can be extracted
from 14 licences annually

45
Current estimates suggest there
are 45 years of primary marine
aggregate production permitted

2
applications for licences could, if
approved, increase the permitted
tonnage by 2 million tonnes

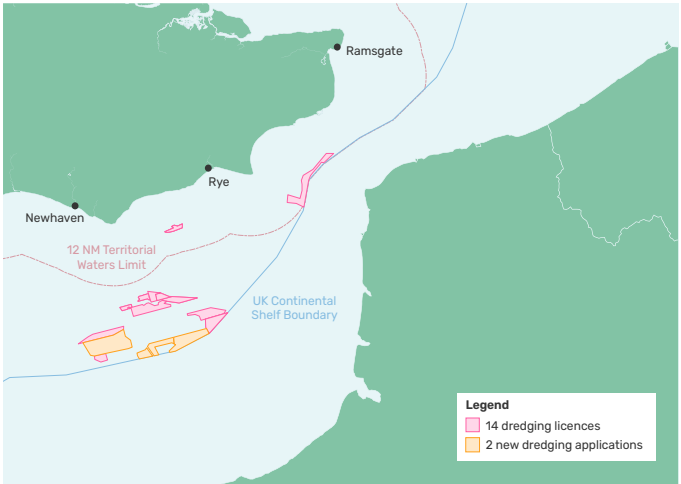
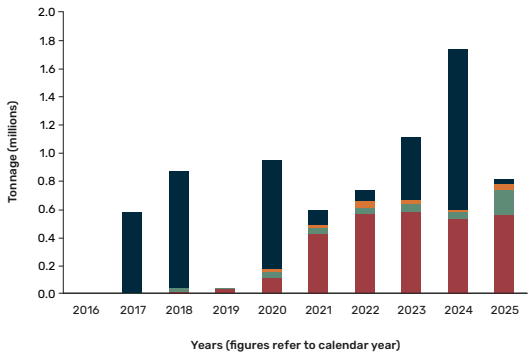
Permitted and
extracted tonnage

Unused permitted tonnage
Extracted tonnage



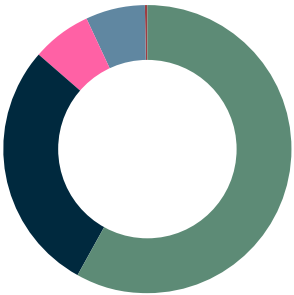
Delivery of marine
aggregate to the region

Secondary use from licences
Dover
Ramsgate
Newhaven

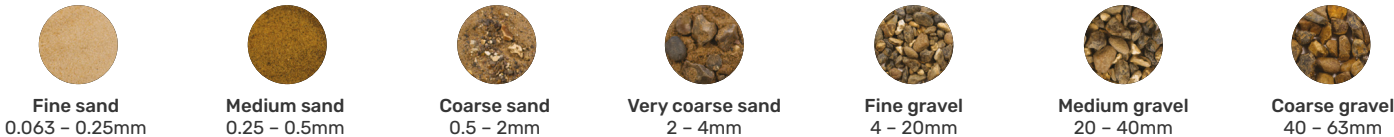


During 2025 material
extraction from the region
was mainly delivered to:

Thames Estuary (58.1%)
Mainland Europe (28.5%)
East Coast (6.6%)
East English Channel (6.6%)
South Coast (0.2%)



Sediment and indicative grain sizes



The South Coast region

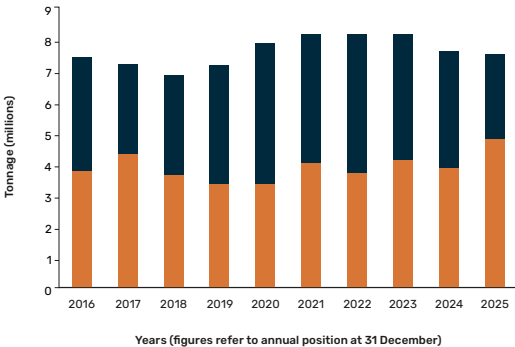
7.5 million tonnes can be extracted from 15 licences annually

17 Current estimates suggest there are 17 years of primary marine aggregate production permitted

2 applications for licences could, if approved, increase the permitted tonnage by 1 million tonnes

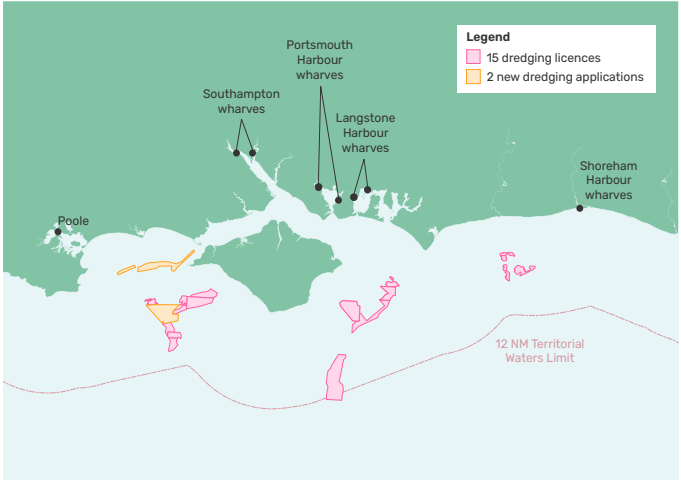
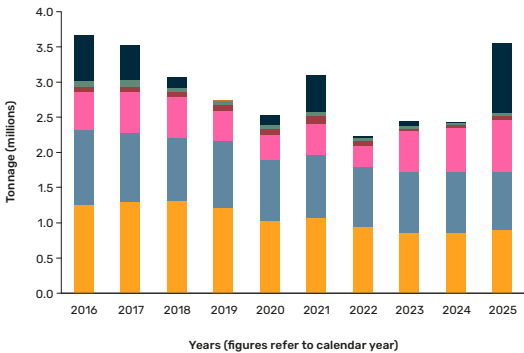
Permitted and extracted tonnage

- Unused permitted tonnage
- Extracted tonnage



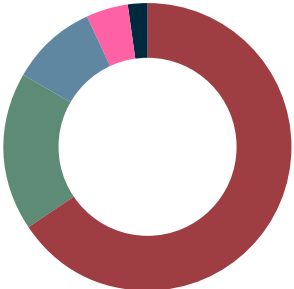
Delivery of marine aggregate to the region

- Secondary use from licences
- Littlehampton
- Cowes
- Poole
- Langstone Harbour wharves
- Southampton wharves
- Shoreham Harbour wharves

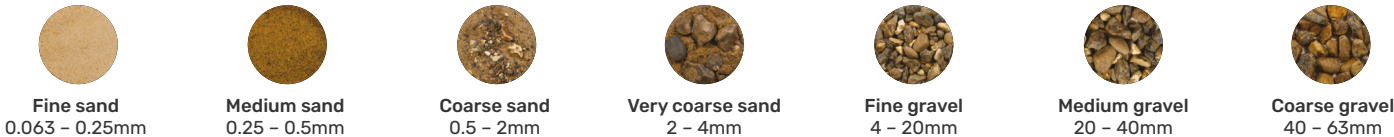


During 2025 material extraction from the region was mainly delivered to:

- South Coast (65.7%)
- Thames Estuary (17.8%)
- East English Channel (9.8%)
- East Coast (4.5%)
- Mainland Europe (2.2%)



Sediment and indicative grain sizes

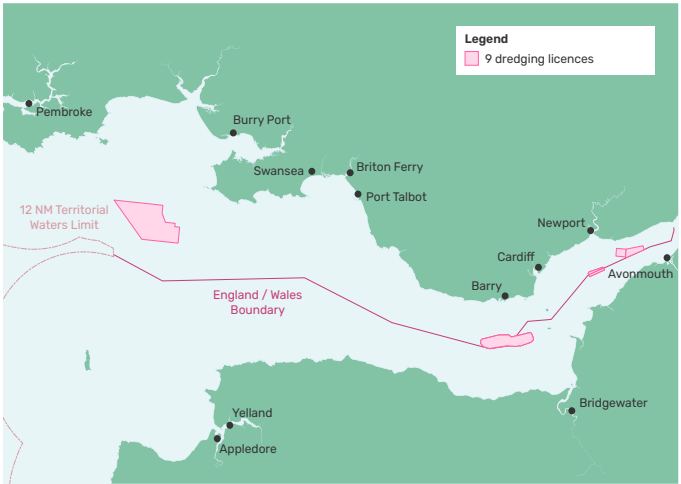
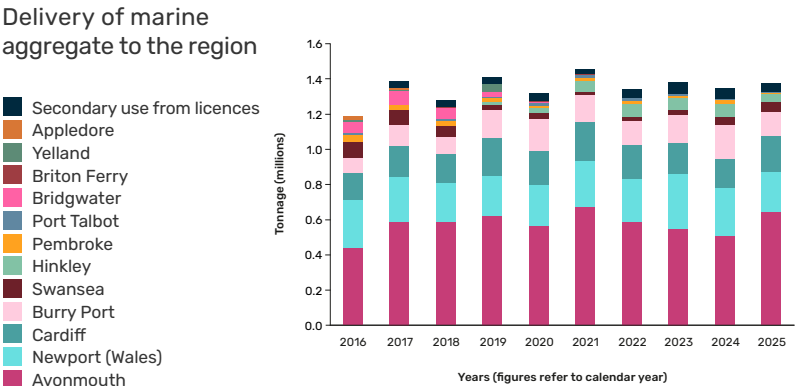
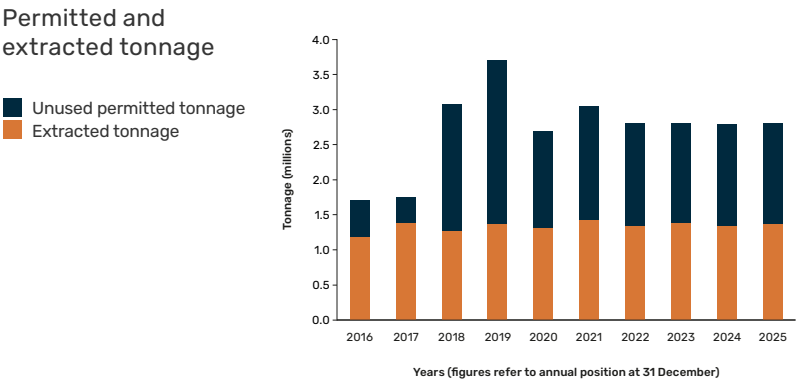


The South West region

2.8
million tonnes can be extracted
from **9 licences** annually

18
Current estimates suggest there
are **18 years** of primary marine
aggregate production permitted

0
There are currently no applications
in the South West region

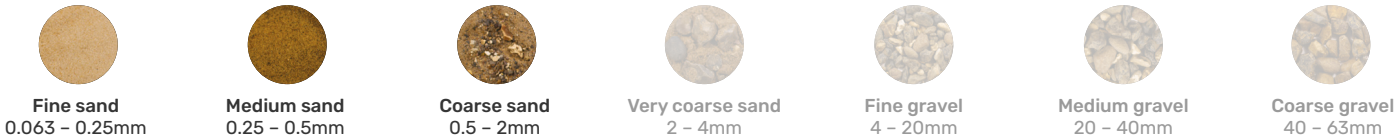


During 2025 material extraction from the region was mainly delivered to:

- South West - English Wharves (52%)
- South West - Welsh Wharves (47.9%)
- South Coast (0.04%)



Sediment and indicative grain sizes



The North West region

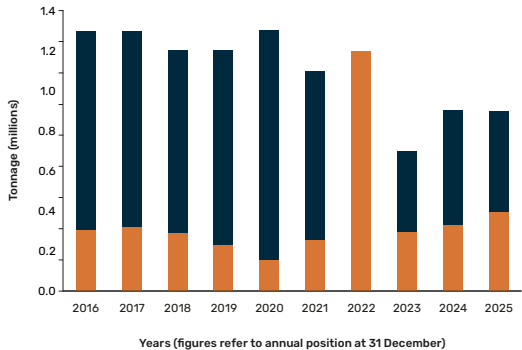
0.9
million tonnes can be extracted
from 2 licences annually

34
Current estimates suggest there
are 34 years of primary marine
aggregate production permitted

0
There are currently no applications
in the North West region

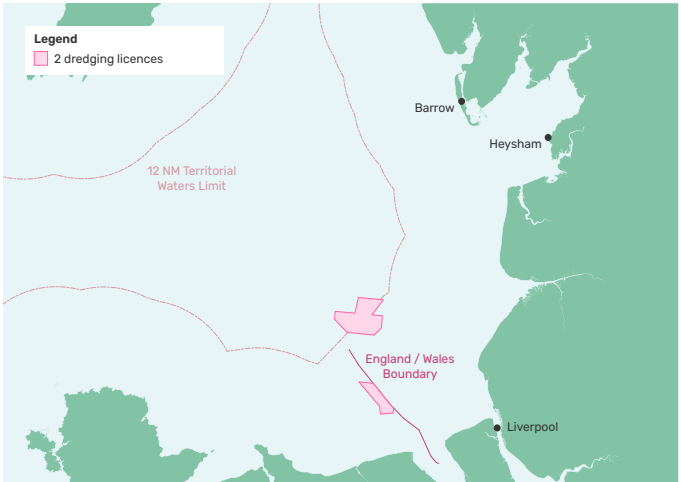
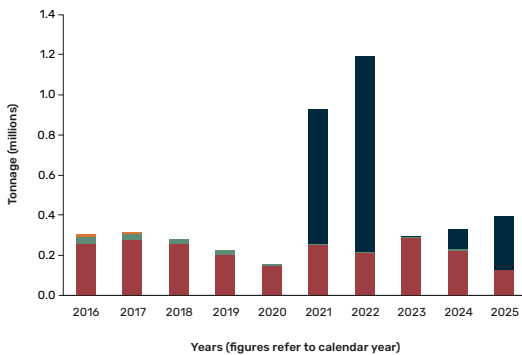
Permitted and
extracted tonnage

Unused permitted tonnage
Extracted tonnage



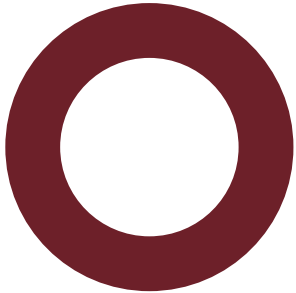
Delivery of marine
aggregate to the region

Secondary use from licences
Barrow
Penrhyn
Liverpool wharves

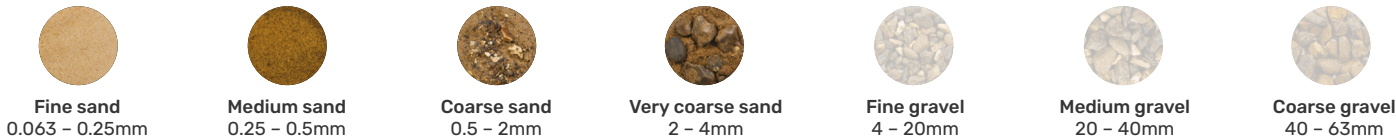


During 2025 material
extraction from the region
was mainly delivered to:

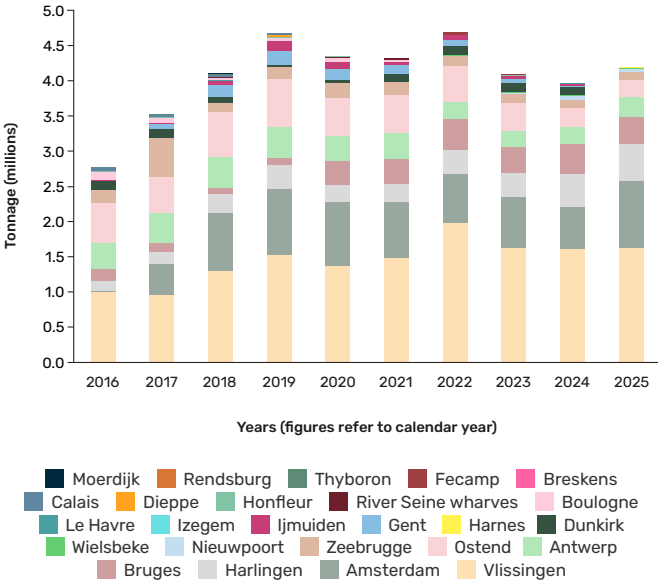
North West - English Wharves (100%)



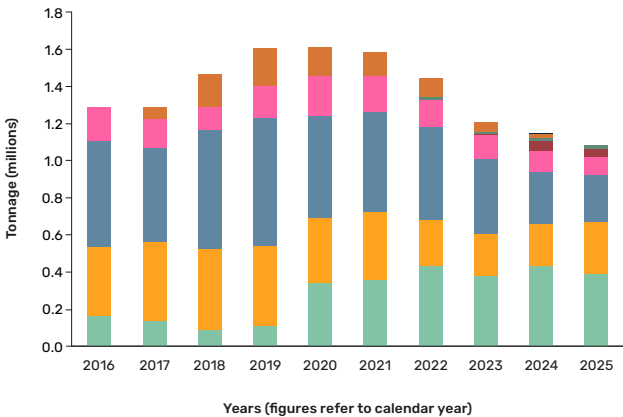
Sediment and indicative grain sizes



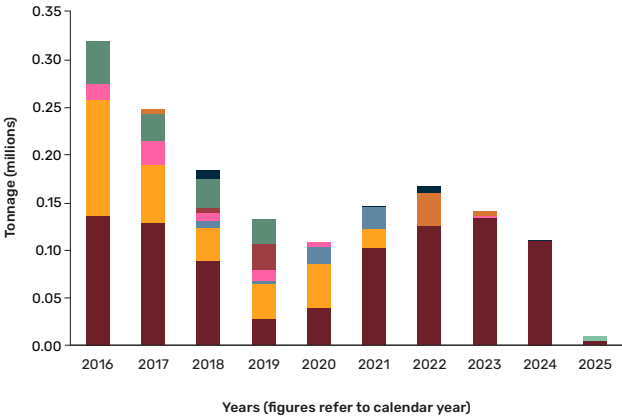
Export to mainland Europe from the UK



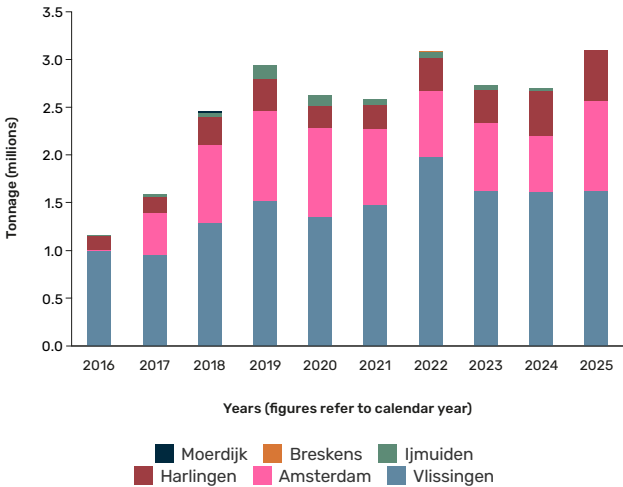
Delivery of marine aggregate to Belgium



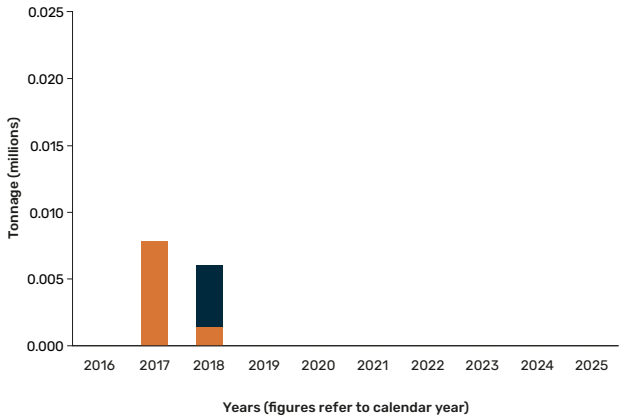
Delivery of marine aggregate to France



Delivery of marine aggregate to The Netherlands



Delivery of marine aggregate to Northern Europe



During 2025 material extracted from Crown Estate licensed areas was exported to:

- The Netherlands (3.1m)
- Belgium (1.08m)
- France (0.01m)



Uses of marine aggregates around the UK

The below projects have all used marine aggregates in their construction.

Coastal & flood defences

- 1 Minehead Beach
- 2 Sea Defences (reefs), Sea Palling
- 3 Thames Barrier, London
- 4 Clacton Beach
- 5 Colwyn Bay Beach
- 6 Pevensey Bay Beach
- 7 Lincs Shore Beach
- 8 Dawlish Warren Beach
- 9 Bacton to Walcott Sandscaping scheme
- 10 Bournemouth Beach
- 11 Hythe to Lydd Coastal Defence scheme

Commercial development & regeneration

- 12 1 New Burlington Place W1, London
- 13 20 Fenchurch Street (Walkie-Talkie), London
- 14 Cardiff Bay Barrage
- 15 Canary Wharf & Docklands Developments, London
- 16 Central St Martins, London
- 17 Spinnaker Tower, Portsmouth
- 18 Superstore site raising, Seaton
- 19 Land reclamation, Rochester Riverside
- 20 Dover Western Docks Revival
- 21 St James's Market, London

Energy & utilities

- 22 Energy Recovery Facility, Newhaven
- 23 Wastewater Treatment Plant, Birkenhead
- 24 London Array Wind Farm
- 25 Nuclear Power Station, Dungeness
- 26 Thames Tideway Tunnel, London
- 27 Hinkley Point C Nuclear Power Station, Bridgwater

Community & leisure

- 28 Principality Stadium, Cardiff
- 29 National Botanic Gardens of Wales, Great Glasshouse, Carmarthenshire
- 30 The Darwin Centre, Natural History Museum, London
- 31 Northumberland Development Project, Tottenham Hotspur FC, London
- 32 British Airways i360 Observation Tower, Brighton
- 33 Everton Football Ground, Bramley Moore docks

Port development

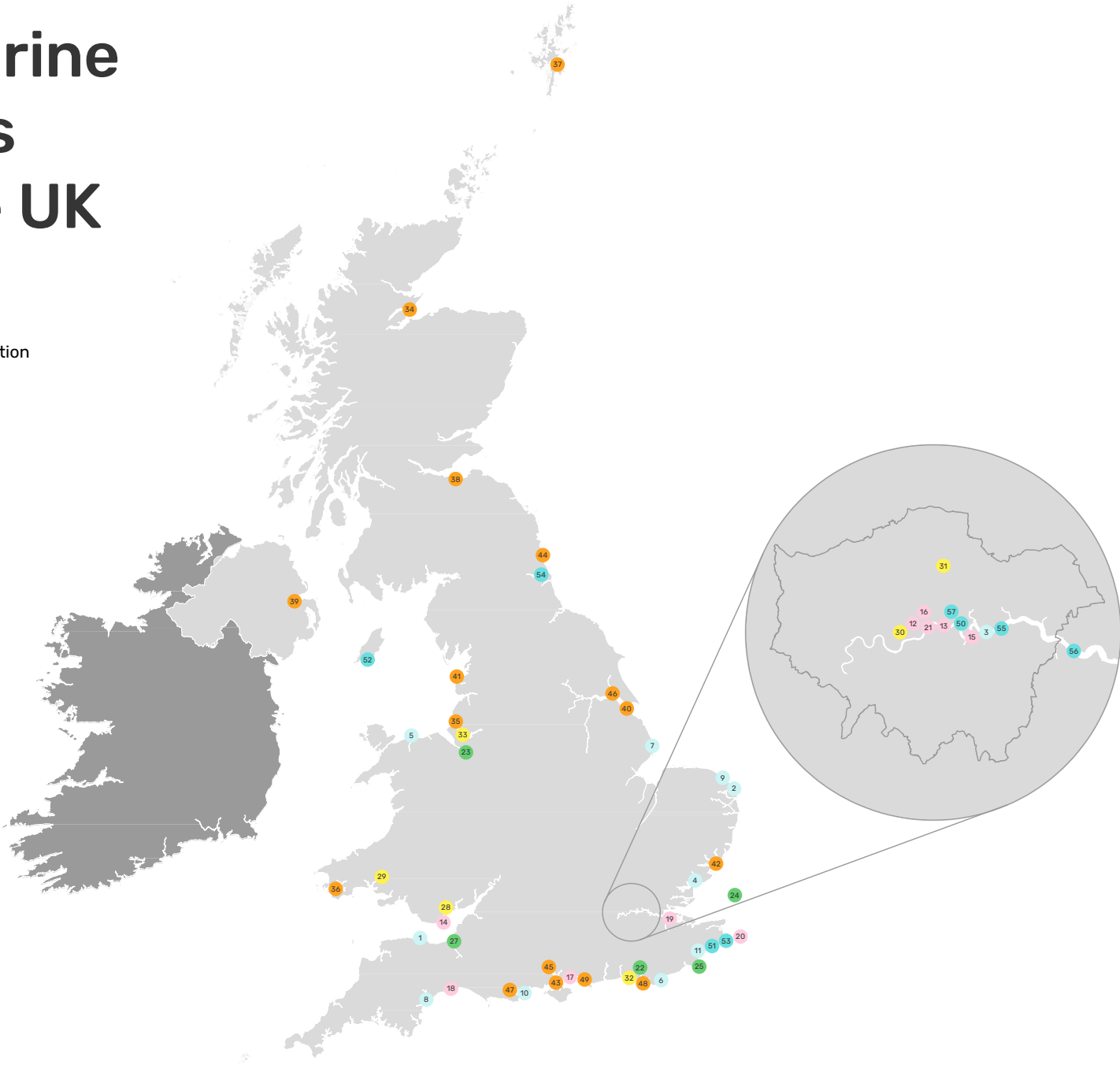
- 34 Nigg Yard, Cromarty Firth
- 35 Liverpool2 Container Terminal
- 36 Oil Terminal, Milford Haven
- 37 Lerwick, Shetland Islands
- 38 Leith Docks, Edinburgh
- 39 Belfast
- 40 Grimsby
- 41 Fleetwood
- 42 Container Terminal, Felixstowe
- 43 Breakwater, Cowes
- 44 Blyth
- 45 Container Terminal, Southampton
- 46 Green Port Hull
- 47 South Quay, Poole
- 48 Brett Wharf, Newhaven
- 49 Brett Wharf, Portsmouth

Transport infrastructure

- 50 Canary Wharf Underground Station, London
- 51 Channel Tunnel Rail Link
- 52 Ronaldsway Airport Extension, Isle of Man
- 53 Ferry Terminal, Dover
- 54 Gateshead Millennium Bridge, Newcastle-upon-Tyne
- 55 City Airport, London
- 56 Queen Elizabeth II Bridge, Dartford
- 57 Crossrail, London

Uses of marine aggregates around the UK

- Coastal & flood defences
- Commercial development & regeneration
- Energy & utilities
- Community & leisure
- Port development
- Transport infrastructure



Havant Thicket Reservoir: Delivering water resilience through marine aggregates



Havant Thicket in southern Hampshire is the site of Portsmouth Water's Havant Thicket Reservoir, the UK's first new reservoir in more than 30 years. The scheme forms a vital part of plans to improve long-term water resilience in the south east, providing a sustainable supply while helping to protect Hampshire's internationally rare chalk rivers.

When complete, the reservoir will be up to a mile wide and around 18 metres deep, with a storage capacity of 8.7 billion litres. It will be filled using surplus water from natural springs in the Havant area.

The location was carefully selected, in part due to the presence of natural clay bedrock, which provides an effective seal for long-term water storage. Marine sand and gravel play a key role in the construction of the reservoir. Holcim UK and Tarmac are supplying marine aggregates following technical assessment of available material options.



Aggregate supply for Havant Thicket Reservoir

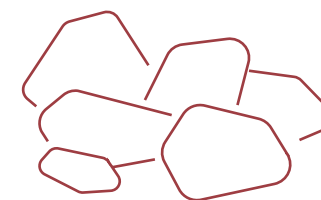
To date, approximately 200,000 tonnes have been delivered from nearby wharves, with further material required to support ongoing earthworks, wetland areas, drainage systems, embankments, concrete structures and a future visitor centre.

The aggregates are used to form drainage blankets and foundation layers that support the reservoir's long-term performance and water management. Marine dredged sand is also used during construction to reduce pore water pressure in the site's surficial clays, enabling the safe movement of heavy construction equipment. Sustainability has been central to the project approach. Local marine sourcing has reduced transport distances and associated carbon emissions, supported by efficient logistics. As a nationally significant infrastructure scheme, Havant Thicket Reservoir demonstrates how marine aggregates can support complex construction while contributing to a secure and sustainable water future for the region.



8.7 billion
litres

of water storage capacity



200,000
tonnes

of marine aggregates
supplied to date

Southsea coastal defence scheme

The Southsea Coastal Defence Scheme, which commenced in 2020, comprises six sub-frontages and, upon completion in 2027/2028, will provide protection against coastal flooding and erosion for the next 100 years, including allowances for climate change.

The Scheme is being delivered for Portsmouth City Council through Coastal Partners, with funding and strategic backing from the Environment Agency and the UK Government.

A defining challenge of the project is its location within a busy residential area and popular tourist destination. From the start a strong stakeholder engagement strategy was fundamental for the project to be successful. Together, Portsmouth City Council, Coastal Partners and the Public Liaison Officer, agreed who the key stakeholders were for each sub-frontage and a tailored communication plan was established. This proactive approach ensured all relevant stakeholders were updated and supported as the project progressed.

As part of the wider multi-year scheme, one of the key deliveries was the installation of approximately 208,000 tonnes of rock armour for Frontages 1, 3 and 4. To enhance environmental outcomes, the design incorporated tidepools and ground out rock pools, accelerating the colonisation of marine life and improving biodiversity along the rock revetment, greening of the grey rocks with marine life.

In earlier phases of the project, shingle was dredged from Area 451 by the TSHD Sospan Dau in a small beach recharge scheme.

The most significant beach renourishment works were delivered in 2025, across two major phases. In spring 2025, the TSHD Strandway was mobilised with the Crown Estate's Electronic Monitoring System (cEMS) to dredge over 110,000 tonnes of shingle from Area 451 for Sub-Frontage 3.

Coastal
protection
works at
Southsea



Image courtesy of Boskalis

This was followed by the largest renourishment operation in November 2025, supporting the final frontage of the Scheme at Southsea Beach (Sub-Frontage 6).

The mobilisation for this final phase began in July 2025 and required an exceptional logistical solution. Due to the required gravel grading and the long pumping distance from vessel to shore, a bespoke 1000mm diameter pipeline was required. As this specification was unavailable in Northwest Europe, Boskalis Westminster sourced the pipelines from its Site in Ras Al-Khaimah in the United Arab Emirates. Around 100 containers were loaded with sinker, floating and sandfill pipes and shipped to Rotterdam and Southampton. In two separate tows the sinker line and floating lines were mobilised from Rotterdam and towed to Southsea Beach in October.

Dredging and placement of shingle for coastal defense at Southsea Beach



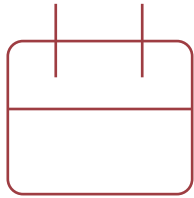
Image courtesy of Boskalis

Altogether once in place, the pipeline to pump and distribute the shingle from the dredger to the beach was over 1.2km long. In November the TSHD Gateway was mobilised, again with the cEMS, and started the reclamation works. Over a four-week period, more than 880,000 tonnes of shingle was dredged from Area 451 and placed on Southsea Beach, completing the final phase just before Christmas.

The departure of the Gateway from Southsea marked the completion of Boskalis Westminster's final frontage on this landmark coastal defence project. This achievement was further recognised when the Scheme received two major accolades, winning awards at both the British Construction & Infrastructure Awards and the 2025 Construction News Workforce Awards.

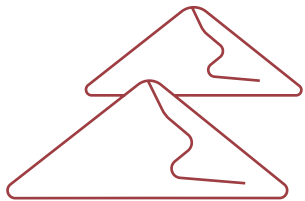


Image courtesy of Boskalis



100 years

of coastal protection
Long-term defence for
Southsea's coastline,
designed with climate
change allowances



990,000
tonnes

dredged from Area 451
and placed on Southsea
Beach

A sediment source for beach replenishment

In the 2021/22 Marine Minerals tender round Bournemouth, Christchurch and Poole (BCP) Council sought a sediment source to sustain local beaches by working with nature.

Exploration and Option “Area 2105” is exclusively allocated for coast protection, because a supply of sediment is required to implement Flood and Coastal Erosion Risk Management (FCERM) policy for the coastline between Durlston Head and Hurst Spit. This region is defined as “sub-cell 5F” in the national Shoreline Management Plan (SMP) and operates largely as a self contained sediment system, west of the Isle of Wight. Area 2105 is the natural offshore store of sediments eroded from local beaches. As a result, it offers a long-term, sustainable resource for nearshore beach recycling, allowing sediment to remain within the local coastal system.

Since the construction of seawalls in the 19th century, this region’s beaches have steadily declined with increasing need for groynes and artificial beach replenishment. Without these interventions, soft cliff erosion would reactivate, with thousands of homes at risk. At Bournemouth, within the Poole Bay Beach Management Scheme, sand has been periodically pumped onto beaches since 1970.

Similar, though less frequent, replenishment schemes have also taken place – and are planned – across Christchurch and Swanage bays. Across the region, approximately 10 million tonnes of sediment have been supplied to date to sustain beaches.

The most recent beach replenishment in 2021 required 350,000m³ of sand. This material was sourced from the North Sea and transported to Poole Bay, resulting in a 30-hour dredging cycle time. This raised concerns about the long-term viability of maintaining beaches and accelerated the search for a new, local sediment source.

Moving to a local sediment source offers fundamental advantages, which include:

- **Greater certainty** that beaches can continue to function as effective coastal defences
- **Retention of sediment** within the natural local system
- **Reduced costs** and improved value for the taxpayer
- **Lower carbon emissions** and reduced environmental impacts from shorter transport distances

The proposed licence is expected to be used approximately once every five years, with each dredging operation removing less than 1% of the total volume of the underwater bank system. Most of this sediment would naturally return to the dredged area between replenishment cycles, helping maintain the long-term balance of the system.

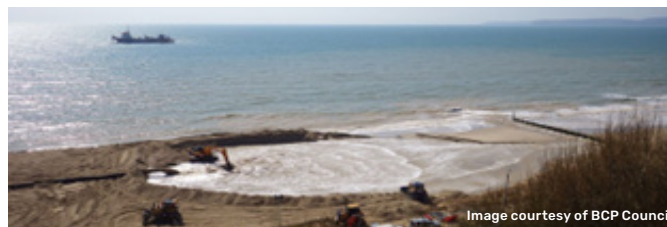
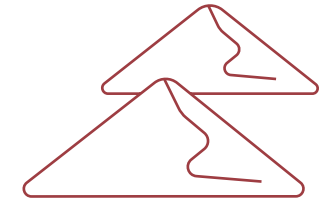


Image courtesy of BCP Council



Image courtesy of BCP Council

Beach replenishment works from 2021 scheme



10 million tonnes

of sediment supplied to sustain beaches across the region to date

The Crown Estate nature strategy: Building a resilient blue future

The Crown Estate's Nature Strategy sits at the heart of its ambition to create a Resilient Blue Future—one where thriving seas, sustainable economic growth and the UK's net zero goals are delivered together.

As steward of the seabed around England, Wales and Northern Ireland, The Crown Estate recognises that nature is not a constraint, but a foundation for long-term prosperity and resilience.

Through its Marine Delivery Routemap, The Crown Estate is taking a holistic, systems-led approach to managing increasing demands on the marine environment.

This strategy looks beyond individual sectors, instead planning across offshore wind, carbon capture, cables, minerals and nature to support biodiversity recovery while enabling vital infrastructure and clean energy development. Central to this is the Whole of Seabed evidence base, which brings together world-class spatial mapping, marine data and stakeholder insight to inform smarter, nature-positive decisions over the coming decades.

Nature recovery is a core outcome. The strategy supports the restoration of marine habitats, strengthens ecosystem resilience to climate change, and promotes healthier seas alongside economic activity.

By working in partnership with industry, regulators, scientists and coastal communities, The Crown Estate is helping to align investment, innovation and environmental stewardship.

Together, this approach sets a clear pathway towards a resilient, productive and nature-rich marine environment—ensuring the UK's seas continue to deliver benefits for people, planet and future generations.

The Crown Estate's nature principles are:



Unlocking space for nature to thrive:

This principle focuses on planning ahead, at a system and spatial scale, so marine environments have the space they need to function, adapt and recover. By using long-term evidence and the Marine Delivery Routemap, decisions aim to identify where nature has the best chance to flourish alongside economic activity, rather than being squeezed out by competing demands.



Protect vulnerable habitats and species:

Protection of the most sensitive and valuable marine habitats and species sits at the core of the approach. Development is actively steered away from Marine Protected Areas and areas of high biodiversity, helping to support ecological resilience and recovery instead of relying on mitigation or compensation after impacts occur.



Deliver positive outcomes for nature and people:

Nature recovery is designed to deliver multiple benefits, not just ecological gains. This includes supporting biodiversity while also strengthening coastal resilience, protecting communities, and improving wellbeing. Nature based solutions, such as habitat restoration, are promoted where they provide clear benefits for both ecosystems and society.



Promote sustainable investment in nature:

A resilient blue future depends on long-term, credible investment in nature recovery. This principle supports innovative and high integrity finance models that help nature projects attract private capital, scale up impact, and deliver lasting environmental benefits, while maintaining confidence in environmental outcomes.

Lymington: A resilient blue future on the Solent

Set on the edge of the Solent and framed by the New Forest, Lymington is a place where community, nature and the marine economy are deeply connected.

Its historic harbour, saltmarshes and coastal waters support sailing, fishing, tourism and wildlife, making the town a strong example of how vibrant coastal communities depend on healthy seas. Within The Crown Estate's vision for a Resilient Blue Future, places like Lymington play an important role.

Through the Marine Delivery Routemap, The Crown Estate is taking a long-term, evidence led approach to managing the seabed and coastline, recognising that nature recovery must sit alongside economic activity and infrastructure planning.

In the Solent, this means carefully balancing busy navigation routes, recreation, and marine development with the protection of sensitive habitats such as mudflats and saltmarshes that help store carbon, support biodiversity and reduce coastal flood risk.

One of the key projects in Lymington focuses on restoring and enhancing the natural saltmarsh defences that protect Lymington Harbour. This initiative aims to boost the restoration and recovery of this crucial habitat, along with the biodiversity it supports.

In collaboration with Land & Water and the Lymington Harbour Commissioners, The Crown Estate is supporting the trial of innovative 'drag-box' technology.

This technique beneficially re-uses sediment removed from the harbour and marinas, to maintain safe navigable depths and for the restoration of eroding saltmarshes at Lymington's seaward edge.

If the drag-box technology proves scalable to open coastal environments, it could provide a transformative solution for coastal flood management across England and Wales.

By demonstrating the value of dredged sediment in restoring saltmarshes, the project paves the way for sustainable opportunities within the Marine Minerals sector and supports long-term resilience planning.

Environmentally, the project addresses the urgent need to restore Boiler Marsh, part of a Site of Special Scientific Interest (SSSI) within the Solent's internationally protected habitats. Reversing saltmarsh decline enhances biodiversity, sequesters carbon, and delivers essential ecosystem services. The initiative also contributes to national targets for improving protected areas, restoring nature, and developing innovative finance mechanisms for environmental stewardship.

This project represents more than just coastal defence—it offers a blueprint for how nature, community, and economy can thrive together.



*Restored
intertidal
saltmarshes
along the Solent
coastline at
Lymington*

Dredging emissions tool

The Crown Estate is committed to meeting a 1.5°C net zero target for its own operations and to developing pathways to reduce emissions across the wider value chain.

To support this goal, The Crown Estate has commissioned Haskoning to develop a Dredging Emissions Tool, with the aim of achieving a robust, evidence-led understanding of the environmental and operational impacts of marine aggregate dredging. The tool is an advanced simulation model that uses detailed operational data from dredging vessels. It produces reports covering a range of performance measures and future scenarios, which help to provide a clear insight into the greenhouse gas emissions of the dredging fleet. The assumptions used in the model have been checked and validated with industry operators.

The results of the initial phase of work show that operational changes, such as reducing vessel speed (“slow steaming”) and shore power, could in the short term, significantly cut emissions with relatively simple changes to current practices. The analysis also found that the transition to HVO in the medium term, and to e-methanol in the longer term, could deliver the greatest overall reduction in GHG emissions.

An update to the model added indicative cost information and assessed the impact of moving dredging activity away from environmentally sensitive seabed areas. This included testing alternative extraction sites that are further from landing locations. The findings of this phase were presented and discussed with operators in the Commercial Workshop held in February 2026.

The tool is now being further developed to explore opportunities for operational optimisation. This includes assessing whether grouping dredging vessels to coordinate their allocation to sites could reduce emissions while maintaining supply. Additional options for development of the tool and further assessment scenarios are being considered.

Cemex Go Innovation Dredger



In addition, the model will support The Crown Estate's annual greenhouse gas reporting, by providing transparent, repeatable emissions estimates based on consistent data and assumptions. Together, the outputs from the dredging emissions model provide The Crown Estate with a powerful analytical tool which is strengthening the understanding of current impacts, enables testing of future scenarios, and supports informed choices that balance the needs of marine aggregates supply with the transition to a lower carbon future.

Beach nourishment carbon tool

Haskoning's ongoing work with The Crown Estate to maximise the potential for further applications of the sandscaping concept identified the need for additional data relating to the carbon emissions associated with such schemes.

It became evident that there was limited data and evidence available to accurately quantify emissions from beach nourishment projects, particularly when compared with alternative and more traditional 'hard engineering' coastal protection measures. To address this gap, Haskoning developed a bespoke Beach Nourishment Carbon Tool, enabling more direct comparison of emissions across the full lifecycle of such projects.

The key emission sources associated with beach nourishment schemes are fuel consumption by dredging vessels and onshore plant and equipment. A number of complex factors influence the level of emissions arising from these sources, including vessel type and size, geographic location, and sediment type. These parameters were incorporated into the model to allow users to tailor outputs accordingly. A critical element in developing the Tool was gaining a greater understanding of these variables, which required consultation with key contractors operating within the sector.

The Tool is structured around two users 'tiers', reflecting different stages of scheme development. Tier 1 supports early-stage option appraisal, enabling coastal engineers to compare schemes based on limited information such as location, scale, and sediment type. Tier 2 is intended for use once early contractor involvement has provided more detailed information, allowing for more accurate calculation of fuel consumption and associated emissions.

A validation exercise was undertaken during the first iterations of the model, using real-world data provided by contractors for two beach nourishment projects, alongside data from the Electronic Monitoring System (EMS) database overseen by Haskoning. This process significantly improved the accuracy and robustness of the Tool.

Throughout the development process, Haskoning consulted with the Environment Agency with the intention that the Tool could be incorporated into, or used alongside, its in-house Carbon Tool, which more effectively represents emissions associated with traditional coastal protection measures.

To enable valid comparisons between outputs from the two tools, a lifecycle approach was adopted, estimating emissions over a 100-year period. As a result, the Tool includes a module allowing users to specify the number of renourishment cycles within a 100-year timeframe and to assess the impact of using alternative, lower carbon fuels.

Haskoning continues to work closely with The Crown Estate and the Environment Agency to further develop and roll out the Beach Nourishment Carbon Tool.

Beach nourishment works



Image courtesy of Chris Taylor, Haskoning



100-year

lifecycle emissions compared across beach nourishment and hard engineering

The Marine Minerals Academy

In recognition of the vital role that knowledge and leadership play in the marine aggregates sector, The Crown Estate continues to champion a unique professional development initiative: the Marine Minerals Academy.

This programme is designed to nurture the next generation of leaders, decision-makers, and influencers across the industry. The academy delivers a structured series of seven intensive one-day workshops, spaced across a full calendar year. Each session is designed to promote active engagement, encourage open dialogue, and stimulate wide-ranging discussion among participants from diverse professional backgrounds. The format is deliberately interactive, creating a collaborative learning environment.

Since its launch in 2015, the Marine Minerals Academy has steadily grown in both reach and reputation. With over 150 alumni to date, the programme has become a recognised stepping stone for those seeking to deepen their understanding of the marine minerals landscape.

The academy is particularly well-suited to emerging business leaders, regulators, consultants, and advisors who are looking to gain a comprehensive overview of the sector. It offers a panoramic view of the policy, regulatory and operational frameworks that underpin marine mineral extraction and management. In doing so, it also highlights the key risks, challenges, and opportunities that organisations must navigate to succeed in this space.

Delivered by a panel of respected experts drawn from industry, government, and consultancy, the course provides a high-impact, real-world learning experience.

Participants benefit from the insights of those actively shaping the sector, as well as from peer-to-peer learning and networking opportunities.

Topics covered include:

- The historical development of the marine sand and gravel industry
- Market applications in construction and coastal resilience
- Techniques for identifying, evaluating, and managing marine mineral resources
- Marine policy frameworks and spatial planning processes
- Licensing regimes and regulatory compliance
- Commercial access to seabed resources and asset stewardship
- A site visit to an operational vessel and wharf for hands-on learning
- The impact of marine archaeology and unexploded ordnance on operations
- Dredger fleet management, including productivity, crewing, and safety
- Business performance strategies, operational optimisation, and cost efficiency
- Environmental sustainability, monitoring, and best practice implementation

By the end of the programme, it is hoped that participants emerge with a well-rounded, sector-wide perspective and the confidence to contribute meaningfully to strategic conversations and decisions within their organisations.



Nick Everington, Portfolio Manager for Marine Minerals, presented a trophy to the winners of the Business Scenario Workshop, which was held on the final event of the 2025 course



Wharf visit to Dagenham

About The Crown Estate

The Crown Estate has a diverse £15bn portfolio that includes urban centres and development opportunities; one of the largest rural holdings in the country; Regent Street and St James's in London's West End; and Windsor Great Park. We also manage the seabed and much of the coastline around England, Wales and Northern Ireland, playing a major role in the UK's world leading offshore wind sector.

We are a unique business established by an Act of Parliament, tasked with growing the value of the portfolio for the nation and returning all of our net profit to HM Treasury for the benefit of public spending. This has totalled £5bn over the last ten years.



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Links and useful references

The Crown Estate

www.thecrownestate.co.uk/our-business/marine/mineral-resources

British Marine Aggregate Producers Association

www.bmapa.org

Marine Management Organisation

www.gov.uk/mmo

Natural Resources Wales

www.naturalresourceswales.gov.uk

British Geological Survey – Minerals UK

www.bgs.ac.uk