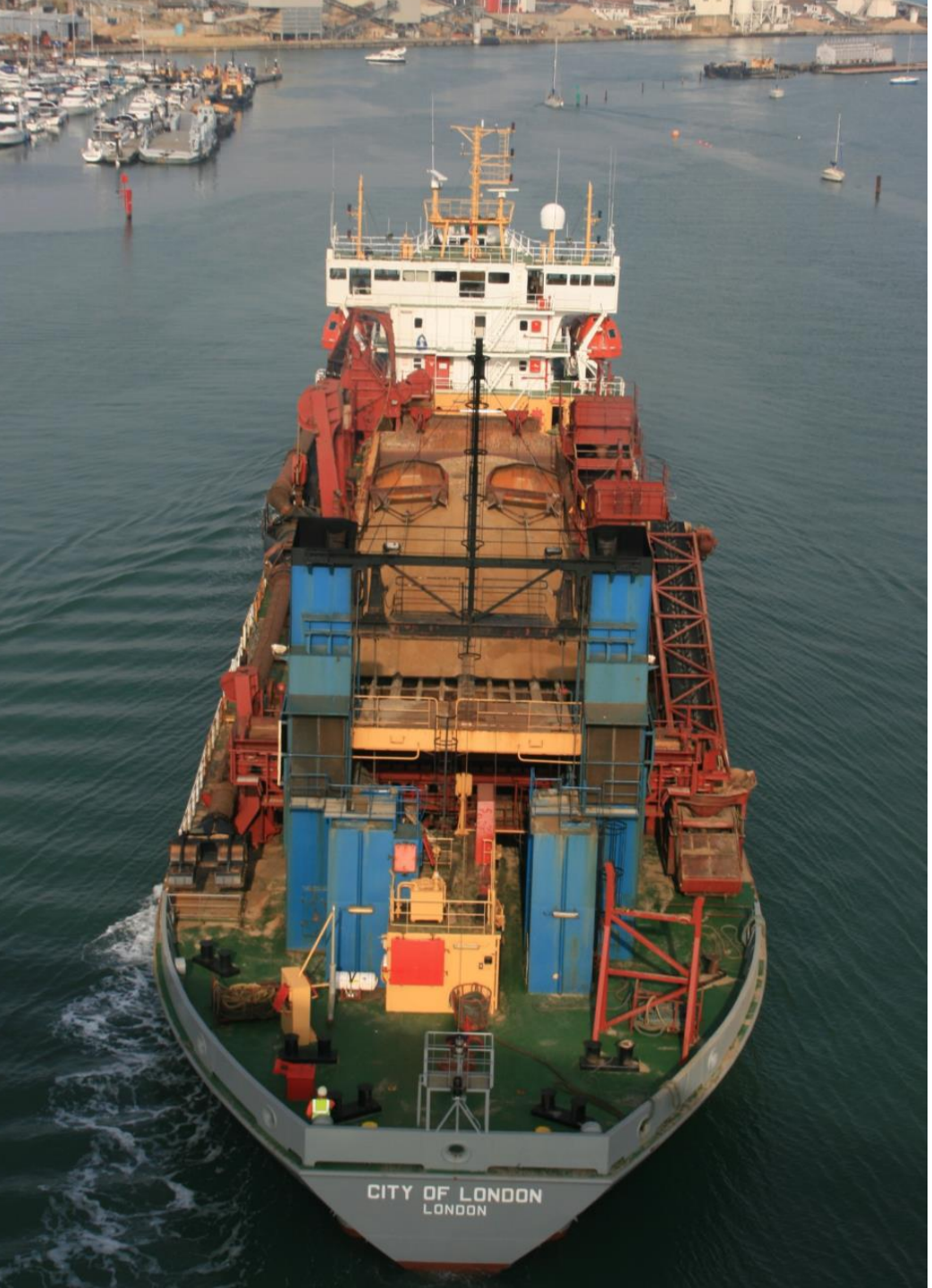


Electronic Monitoring System

Annual Report 2020

A report commenting on EMS activity and trends in the 2020 calendar year

THE CROWN ESTATE

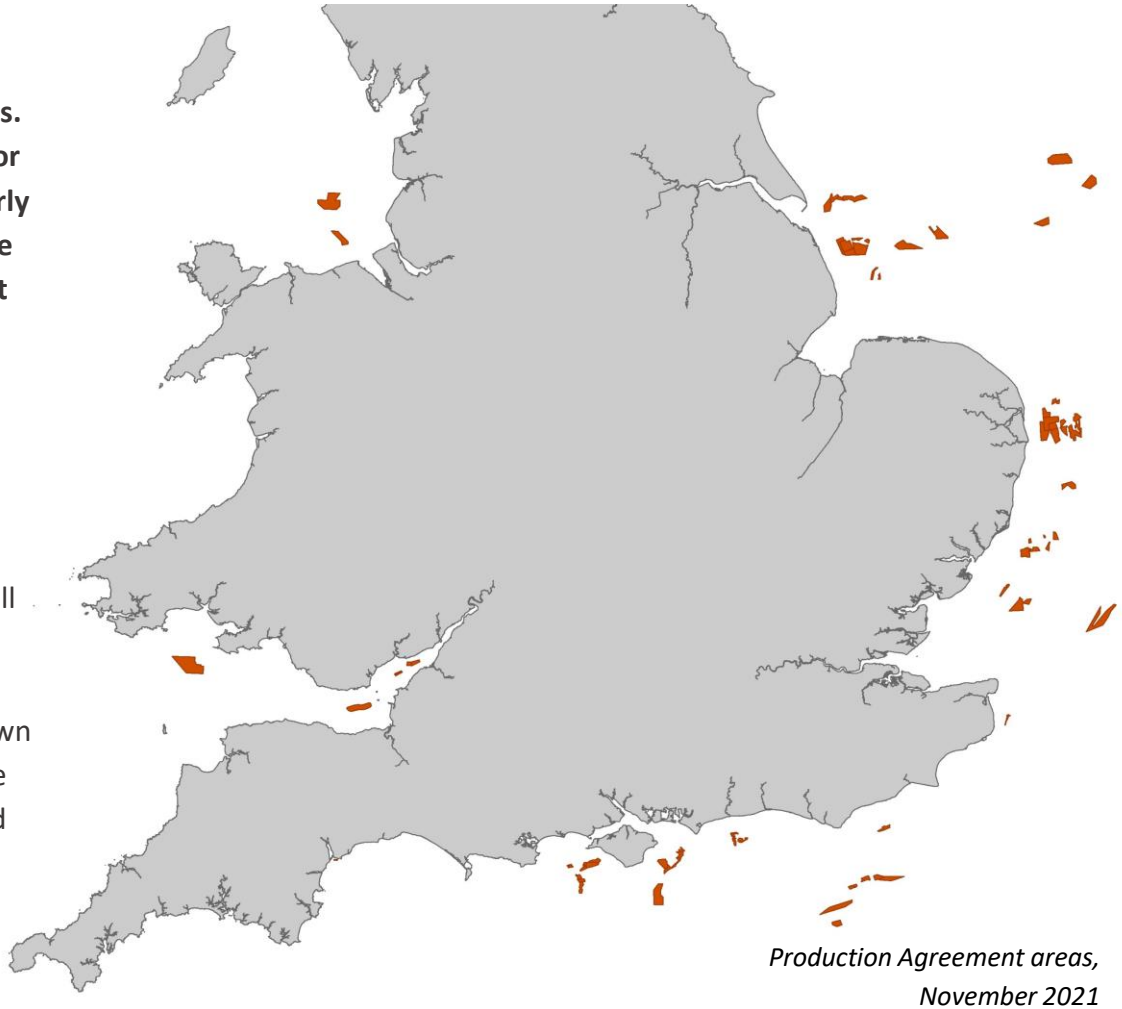
Royal HaskoningDHV
Enhancing Society Together

1. Introduction

The Crown Estate issues Production Agreements to allow the extraction of marine sand and gravel resources from the seabed around England and Wales. These are an important source of quality aggregate for construction and civil engineering projects, particularly in the South East of England and South Wales. Marine sand and gravel are also used in beach replenishment schemes and to act as infill for land reclamation projects.

Since 1993 The Crown Estate have required all vessels dredging on Production Agreement areas to be fitted with an Electronic Monitoring System (EMS) which automatically records the date, time, and location of all dredging activities.

EMS data files are analysed and processed by The Crown Estate as the owner of the seabed and shared with the Regulators (the Marine Management Organisation and Welsh Government). It is the responsibility of the Regulators to undertake any compliance enforcement action under legislation in the event of any infringements.



Production Agreement areas, November 2021

2. EMS Description

EMS black box unit

The Crown Estate entered into a commercial agreement with Foreshore Technology Ltd in 2017 to supply EMS dredging vessel hardware, software and IT infrastructure. Foreshore Technology also provide a help desk service and team of technicians to maintain the system. Prior to this all EMS infrastructure had been provided by individual dredging companies. A variety of sensors and hardware were also used. The new approach with Foreshore Technology has enabled a more uniform approach across the fleet.

The Crown Estate initially purchased all EMS equipment and makes it available to dredging vessels operating for Production Agreement holders. The costs are recouped via a pence per tonne fee payable by all Production Agreement holders twice a year. This approach required the development of a legal framework via consultation with industry and the formation of a steering group to oversee the operation of the system and demonstrate financial transparency.

2. EMS Description

EMS antenna and GPS

Key EMS features

- The EMS is a robust, secure black box-based system, which utilises a simple, stable operating system
- Independent GPS, not connected to vessel systems
- Independent acoustic sensor
- Optional screen to allow bridge crew to monitor EMS status against actual activity
- Vessel operators generally fit all cabling themselves
- A data recording frequency of 10 seconds – previous versions of EMS recorded every 30 seconds
- A web data portal allows authorised users to download data on demand, without long time delays
- A dedicated helpdesk and system repair facility

Security features

- EMS units do not have an off switch and can only be powered down using a time-limited PIN code
- Independent GPS and modem, which are not connected to main vessel navigation systems
- Security seals on all connections.
- The EMS software running in each unit will note in a log file any change in its hardware configuration,
- Data packages are scanned for time gaps and investigated

3. EMSc Description

EMSc hardware – black box unit (top), sensor (bottom)

A version of the EMS (the Contractor EMS, or 'EMSc') is available for temporary installations, such as when vessels are undertaking short term projects.

Key features of the EMSc

- Main equipment is housed in a single, portable case
- A smaller case is deployed near the dredge pipe, with a short cable connecting it to an acoustic sensor.
- Sensor information is passed to the bridge unit via radio connection
- Each unit stores information locally
- The system does not have a screen (access via local web browser)
- The simpler configuration makes it suitable for remote installation by vessel crew

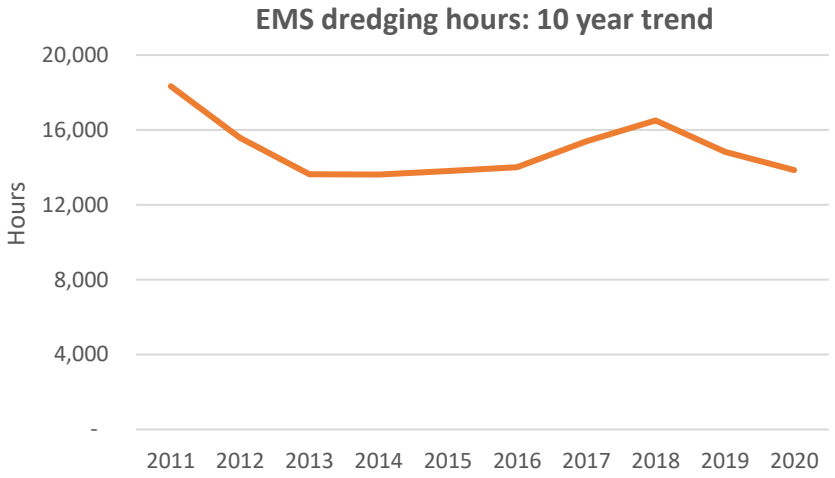
A 'Short Term Hire Agreement' was developed to act as a funding mechanism for the EMSc, which is separate to the funding model for the regular EMS.

4. Annual summary

13,864 hours

Recorded dredging activity

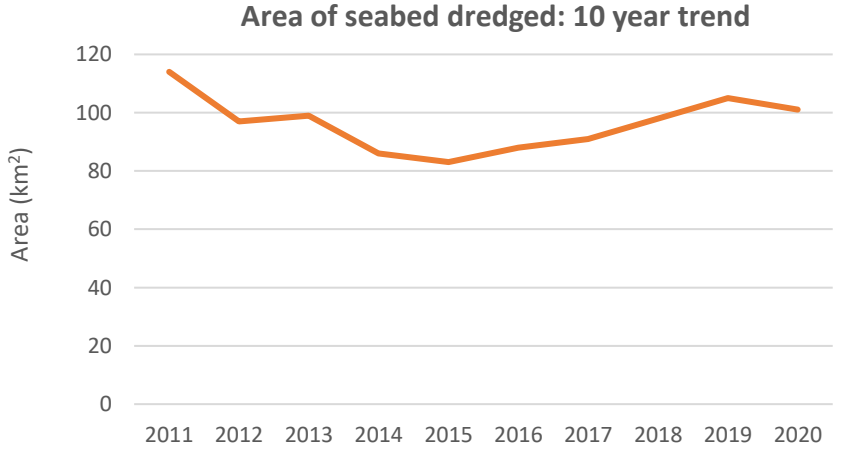
The EMS logs dredging data every 10 seconds. In this way the approximate total recorded dredging hours for 2020 has been calculated using the number of dredging data points as a basis. This figure is lower than the ten year average of 14,962 hours.



101 km²

Area of seabed dredged

The area of seabed dredged is calculated by overlaying all EMS dredge positions on a 50m x 50m grid. This figure is a key metric for the dredging industry as a method of measuring the impact on the seabed. It is frequently compared to the area under licence. In 2020 the percentage of licenced seabed dredged was 10%. A more detailed breakdown is published annually in the 'Area of Seabed Dredged' report series.



4. Annual summary

27

Active EMS units

EMS units were in situ on 27 dredging vessels throughout 2020. One installation took place on a new vessel and one de-installation occurred due to a vessel being scrapped. Removed EMS units are serviced and returned to the pool of spares which is maintained by Foreshore Technology.

66

EMS helpdesk tokens

Helpdesk tokens track an EMS maintenance issue from initial contact through to resolution. Most helpdesk tokens are administrative in nature, and do not result from system faults (such as requesting a PIN to safely deactivate the EMS, or general technical enquiries). Most EMS issues are resolved remotely without the need for a site visit.

24

EMS service and audit visits took place

All vessels which have had EMS units fitted for more than two years receive a servicing visit by a technician. An audit inspection is also made of all equipment to ensure it remains compliant with the initial specification. No significant issues were identified as a result of the audit visits during 2020.

9

EMS maintenance visited were required

Technicians will attend a vessel where remote assistance is not possible. Six of these visits were to reattach EMS sensors and replace security seals following vessel maintenance works, and the remainder were to resolve system damage or faults.

4. Annual summary

3.5 hours

Unauthorised dredging

Irregularity Notices are issued to Production Agreement holders if any indications of unauthorised dredging are present in EMS data.

Three such Irregularity Notices were issued during 2020, and in two of these cases it was concluded no dredging occurred.

However in one case it was confirmed that 3.5 hours of dredging occurred in excluded zones within a Production Agreement area. These findings were shared with the Marine Management Organisation who are the Regulator in this case.

No confirmed dredging occurred outside of Production Agreement areas during 2020.

51 hours

Data time gaps

EMS time gaps are classed as any periods when vessels are at sea and capable of dredging but the EMS did not log data, usually due to system errors or breakdowns. It is established whether a vessel was at sea primarily using Automatic Identification System (AIS) data. AIS is a separate vessel tracking system required by law. Periods when vessels are alongside in port are discounted.

In each case vessel movements and dredging locations were monitored using alternative records such as outputs from other vessel tracking systems, deck logs, legally binding Master's statements or AIS track. In the majority of cases no dredging was found to have taken place during time gaps.

No evidence of unauthorised dredging was found during time gaps in 2020

5. Conclusions

The Electronic Monitoring System, provided by Foreshore Technology has continued to prove itself as a reliable tool for ensuring compliance with Production Agreement and Marine Licence conditions. The Crown Estate remains pleased with the performance of the EMS and feedback from the dredging industry via the EMS Management Group remains positive.

EMS recorded dredging hours in 2020 decreased by 6% since the previous year to 13,864. This figure is also 7% lower than the 10 year average of 14,962.

No dredging occurred outside of licenced seabed in 2020, however 3.5 hours of unauthorised dredging took place in exclusion zones within a licenced area. This figure represents one isolated incident in 2020 during one cargo, and robust steps were taken to prevent a recurrence. The amount of unauthorised dredging in 2020 represents less than 0.03% of total dredging time recorded in the year.

Since 1993 the EMS has recorded approximately:

2 million km
of dredging track

650,000
of hours of dredging activity