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SN 6710 - London and the Tidal Thames, 1250-1550: Marine Flooding, Embankment and Economic Change

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Summary

The project investigated changes in the human and natural environments of the marshlands bordering the tidal river Thames and the Thames Estuary between 1250 and 1550. At the beginning of this period the marshlands had largely been drained and protected by banks or walls, so that they could be used for arable and pastoral farming. During the three centuries studied, however, many of these reclaimed marshes were flooded by the sea or by freshwater inundation. The causes were partly natural and partly human. Major flooding events may have become more common, and clusters of North Sea storm surges occurred, in which winds and tides combined to thrust large quantities of sea-water into the Thames Estuary, overwhelming flood defences. At the same time, declining population after c.1300, and associated agricultural recession, meant that it was no longer so profitable to defend the marshes against the sea. As a result, especially after the 1370s, many marshes flooded, and attempts to recover them were given up. Among the areas most affected were parts of the Barking, East Ham and Dagenham marshes, the Isle of Dogs, Erith and Lesnes marshes and the marshes around the mouth of the river Medway. In these and other locations fishing, fowling and the cutting of reeds and rushes replaced farming as the main sources of employment and income. Londoners complained about some of the effects of flooding, but may have benefited from the 'retreat' from the down-river marshes, which reduced the flood risk to Southwark, Bermondsey and other vulnerable suburbs.

Objectives

The research aimed to contribute to the economic and environmental history of the tidal river Thames and the Thames Estuary during the later middle ages (c.1250-1550). Specifically, it sought to explore the impact of storm surges originating in the North Sea upon the lands bordering the Thames, including the city of London and its suburbs, and to assess the short and long-term human response to these extreme events. The main objectives were:

1. To extend the known chronology of storm surges and marine flooding in the Thames area through an investigation of the period 1450-1550, and to refine and revise the provisional chronology for the period 1250-1450 through the examination of a greater range of manuscript data sources.
2. To investigate the changing impact of marine flooding upon the metropolitan area over the period 1250-1550.
3. To devise measures to help quantify the extent of late medieval retrenchment and land-use change in the marshlands bordering the Thames Estuary and tidal river.
4. To assess the role of London and Londoners in shaping responses to the flood threat and specific flooding events between the mid thirteenth and mid sixteenth centuries.

Methodology

The study was document-based, although the evidence of archaeology was also incorporated through a systematic search of published and unpublished reports of excavations and surveys carried out within the study area. The corpus of post-medieval maps was also examined for indications of coastline changes and the sites of breaches in sea- and river-walls.

The principal documentary sources used were:

1. Manuscript manorial accounts, farmers' accounts and related estate documents (thirteenth to sixteenth centuries) containing details of land-use and the maintenance of sea and river-defences at a sample of manors which included areas of marshland adjoining the Thames Estuary and tidal river.
2. Printed records of the English central government, c.1250-1550. These sources provide much detail on the incidence of flooding and on responses to the flood threat, including the issuing of commissions *de walliis et fossatis* (commissions of sewers).
3. Printed sources for the governance of London, thirteenth to sixteenth centuries, including *Calendars of Letter Books, Plea and Memoranda Rolls, Liber Albus* and *Liber Custumarum*, and unpublished fifteenth- and early sixteenth-century Journals and Repertories.
4. Lay subsidy returns (National Archives, PRO class E179) and printed editions of the 1334 and 1524 lay subsidies.

Quantifiable data on coastal- and river-defence expenditure and land-use in estuarine and riverside marshes within a study area extending from the environs of London eastwards to Whitstable in Kent and Foulness in Essex were collected from manuscript sources and entered into Excel spreadsheets. These data have been used to generate time-series, illustrating both crisis episodes, associated with abnormal expenditure on defences and the loss of livestock by drowning, and long-term shifts in land-use indicated by the highly detailed agricultural information contained in manorial accounts and associated estate documentation. Correlation of time-series and comparison with data from the Low Countries has been used to distinguish widespread, surge-related flooding from localised events. Information on land values, labour costs and commodity prices was used to model the changing economic viability of reclaimed marshlands over the course of the later middle ages. Data on taxable wealth in the early fourteenth and early sixteenth centuries and associated information on tax remissions was entered into spreadsheets and analysed to help identify those areas most affected by long-term flooding and retrenchment. The more qualitative data from printed and manuscript sources has been entered into appropriate text-analysis software for easy organisation and retrieval. These data on events, policies and institutions are used to contextualise and interpret the quantitative data. The spatial impact of some individual storm surges is reconstructed from analysis of the full range of quantitative and qualitative sources. Mapinfo software has been used to map aspects of the data.

Project Findings

Analysis of quantitative and qualitative sources has permitted the identification of key episodes in the history of the tidal Thames and Thames Estuary between the mid thirteenth and mid sixteenth centuries. The most serious and wide-ranging episodes of surge-related flooding affecting the Thames-side lands occurred in the 1280s, 1323-4, 1334, the mid 1370s, 1404, 1421, c.1450, 1477 and 1530, although many other less severe or more localised floods have been identified. Before the Black Death of 1349, most flood damage

sustained by the reclaimed marshlands bordering the Thames was remedied fairly rapidly. Afterwards, and in particular from the mid 1370s onwards, more protracted flooding of extensive areas became common; in some cases reclaimed lands reverted to inter-tidal conditions for periods of a century or more. This was true of lands in the Barking and East Ham area flooded in the 1370s, and of many of the marshes around the mouth of the river Medway, devastated by storm surges c.1400. Economic conditions did not favour sustained recovery of 'drowned marshes' until the sixteenth century, when institutional disruption, associated with the dissolution of the monasteries, provoked further episodes of flooding, as at Lesnes in NW Kent.

The lands subject to long-term flooding had formerly comprised highly-valued arable and pasture lands, many of them having strong links to the London market. The rise in labour costs and decline of prices for agrarian produce reduced their value in the aftermath of the Black Death. While some lands continued to be farmed, and their sea- and river-defences maintained, where flooding occurred, often as the direct result of a storm surge, it might no longer be economically viable to effect repairs. Landlords and tenants in such locations might rather choose to exploit newly developed fisheries on flooded marshes, or to harvest other semi-wild resources through fowling and the cutting of reeds or rushes.

Whereas c.1300 London's interest in the Thames-side lands had primarily been one of investment in profitable agricultural land, and marketing the produce thereof, the later middle ages saw concern expressed for the river's fisheries, as weirs and fish-traps set up on flooded marshland were perceived to cause damage to stocks through the indiscriminate trapping of fry. Attempts were made to extend the jurisdiction of the Mayor to flooded ground adjoining the Thames, in order to tackle this issue. At the same time, London's southern suburbs may have suffered less flooding than earlier, due to the 'retreat' from the marshlands down-river, which provided new storage capacity for floodwaters.

Dataset Description

The deposited dataset consists of eleven data files, containing data collected during the research project 'London and the Tidal Thames 1250-1550: Marine Flooding, Embankment and Economic Change'. Further context and initial analysis of the data can be found in J.A. Galloway, 'Storm flooding, coastal defence and land use around the Thames estuary and tidal river c.1250-1450', *Journal of Medieval History* 35 (2009), 171-188.

1) Marsh expenses

This part of the study consists of 10 tab delimited text files, containing data on annual expenditure on the maintenance and repair of sea and river defences and marshland drainage ditches and sluices at 10 manors around the tidal river Thames and the Thames Estuary. The data is drawn from annual manorial accounts, which normally run from Michaelmas to Michaelmas (29th September). Recording practice varies slightly between manors and accounts. In some accounts, a separate paragraph is included, headed 'Custus marisci' or similar, while in others the expenditure is recorded in a general paragraph on 'repairs' or miscellaneous expenses. In all cases it has been attempted to distinguish marsh and sea/river defence expenditure from other types of building and repair work.

Each file contains the following fields:

- **year_start** (column A) – representing the year beginning 29th September
- **year end** (column B) – representing the year ending 28th September

- **£** (column C) - the recorded expenditure on marsh and sea/river defences, converted from pounds shillings and pence into decimal pounds, rounded to 2 decimal places. Note: blank field means no data. Zero means that there is an account for this year, but no relevant expenditure is recorded.
- **notes** (column D) – any additional information on the dating of the record (part-year accounts etc.), or explaining ambiguities or uncertainties in the data.

The 10 files contain data for the following manors:

Barksore, Kent - marsh_expenses_barksore.tab

Manor of Christ Church Priory Canterbury, located near the mouth of the River Medway.

Inclusive dates: 1278-9 to 1427-8, with gaps.

Archive Refs: Canterbury Cathedral Archives, DCc/Barksore 1-61; DCc/ MA2.

Cliffe, Kent - marsh_expenses_cliffe.tab

Manor of Christ Church Priory Canterbury, located on the Hoo peninsula north of Rochester.

Inclusive dates: 1282-3 to 1407-8, with gaps

Archive Refs: Canterbury Cathedral Archives, DCc/ Cliffe 1-50.

Deptford, Kent - marsh_expenses_deptford.tab

Manor of the Queen, located between Greenwich and Rotherhithe.

Inclusive dates: 1470-1 to 1508-9, with gaps.

Archive refs: National Archives, PRO SC6/1114/12-15, SC6/HenVII/1423-1447, SC6/HenVIII/6530.

Elverton, Kent - marsh_expenses_elverton.tab

Manor of Christ Church Priory Canterbury, located near Faversham.

Inclusive dates: 1278-9 to 1418-19, with many gaps

Archive Refs: Canterbury Cathedral Archives, DCc/ Elverton 1-49.

Erith, Kent - marsh_expenses_erith.tab

Manor of the Queen, located between Woolwich and Dartford.

Inclusive dates: 1470-1 to 1514-15, with gaps.

Archive refs: National Archives, PRO SC6/1114/12-15, SC6/HenVII/1423-1447; SC6/HenVIII/6530-6.

Foulness, Essex - marsh_expenses_foulness.tab

Manor of de Bohun, and later, Butler earls of Ormond, located at the south-eastern tip of Essex.

Inclusive dates: 1420-1 to 1498-9, with many gaps.

Archive refs: National Archives, PRO SC6/HenVII/1128-32; Essex RO D/DK M45, M135-6 , D/DQs 189 ; British Library, Mss Dept., Eg. Roll 8342-4, 8440

Ham, Kent - marsh_expenses_ham.tab

Manor of Christ Church Priory Canterbury, located immediately to the north of Faversham.

Inclusive dates: 1279-80 to 1418-19 with many gaps.

Archive Refs: Canterbury Cathedral Archives, DCc/Ham 1-37; DCc/Elverton 5-7; DCc/ Copton 31-48; DCc/ MA 2.

Northfleet, Kent - marsh_expenses_northfleet.tab

Manor of the Archbishop of Canterbury, located to the west of Gravesend.

Inclusive dates: 1317-18 to 1397-8, with many gaps.

Archive refs: Lambeth Palace Library, ED778-787.

Sharpness, Kent - marsh_expenses_sharpness.tab

Manor of Boxley Abbey, located in the marshes at the mouth of the River Medway.

Inclusive dates: 1287-8 to 1411-12, with many gaps.

Archive Refs: National Archives, PRO SC6/896/16-27, 897/1-14, 3479/25.

Swanscombe, Kent - marsh_expenses_swanscombe.tab

Manor of the Queen, located to the west of Gravesend

Inclusive dates: 1470-1 to 1536-7, with gaps.

Archive refs: National Archives, PRO SC6/1114/12-15, SC6/HenVII/1423-1447;
SC6/HenVIII/6530-6555.

2) walliis_et_fossatis.tab

This file contains an annual count of royal commissions *de walliis et fossatis* (later known as commissions of sewers) issued by the crown for the tidal River Thames and the Thames Estuary between 1280 and 1500. These royal commissions were ad hoc, temporary bodies empowered to investigate problems in specific localities, or granted general oversight of flood protection and drainage throughout a county or along a defined stretch of coast. Their primary role was to encourage cooperation amongst landholders in marshland areas, and to enforce the so-called 'marsh law'. For further details of the institution, see Galloway, 'Storm flooding...', cited above. The data are drawn from the published Calendar of Patent Rolls, (44 vols, London, 1891–1911, and online version, devised by G.R. Boynton, at <<http://sdrc.lib.uiowa.edu/patentrolls/>>), and from W. Dugdale *The History of Imbanking and Draining* (2nd edn. London, 1777).

The file contains one sheet, with the following fields:

- **year** (column A) – Calendar year in which the commission was issued
- **commissions_river** (Column B) – Number of commission issued for the tidal stretch of the River Thames between London Bridge and Gravesend / Tilbury.
- **commissions_estuary** (column C) – Number of commissions issued for the outer Thames Estuary, to the east of Gravesend / Tilbury and extending out to Foulness in Essex and Whitstable in Kent.
- **commissions_general** (column D) – Number of commissions of general applicability, but which can be interpreted as relating to the Thames area e.g. commission for 'the sea-coasts of Essex' or 'the marshes in the county of Kent'.
- **commissions_total** (column E) – The total number of these three types of commission issued each year