Hubert Lamb Centenary Meeting, Norwich, 7 September 1213

Medieval Documentary Sources from England

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Recording the weather

William Merle’s weather diary 1337-44:
Consideraciones Temperiei pro 7 Annis.
Bodl. Oxf., MS Digby 176
Compiling the weather
Accessing the weather

# Documentary Sources - Overview

<table>
<thead>
<tr>
<th>Narrative Sources</th>
<th>Administrative/ Institutional Sources</th>
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<tbody>
<tr>
<td>- chronicles (monastic chronicles, town chronicles – London)</td>
<td>- documents of institutions, record weather as a by-product</td>
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<td>- annals</td>
<td>- customs records</td>
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<td>- weather diaries</td>
<td>- bridgemaster’s accounts</td>
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<td></td>
<td>- manorial accounts</td>
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<td>- municipal accounts</td>
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<td>- made by individuals (monks, secular clergymen, lay towns people)</td>
<td>- made by many officials - end with the life of the institution</td>
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<tr>
<td>- often end with the authors death</td>
<td>- long series</td>
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- documents of institutions, record weather as a by-product
- customs records
- bridgemaster’s accounts
- manorial accounts
- municipal accounts
- made by many officials - end with the life of the institution
- long series
1. Advantages
   - descriptions of the impact of extreme events and climate variability on humans and agriculture
   - information for all seasons possible

2. Problems
   - uneven spatial and temporal distribution (for the period 1450-1490 hardly any English narrative sources survive)
   - concentration on extremes
   - differentiation of non-contemporary and contemporary sources and non-contemporary and contemporary parts in the chronicles necessary
Narrative Sources

1384: Preterea in ista estate tanta erat siccitas ita ut fluvii et fontes perhenni cursu de terra scaturientes, immo (quod magis mirabile videbantur) eciam putei altissimi siccarentur; et duravit ista siccitas usque festum Nativitatis beate Marie; et ab hinc usque festum Purificaciones ejusdem Virginis continuo, exceptis paucis diebus, pluebat. Grosso vero animalia in ista estate quamplurima pro aque penuria perierunt.

During this summer there was so great a drought that streams and springs which normally gushed from the ground in ceaseless flow, and indeed, as seemed yet more remarkable, even the deepest wells, all dried up. The drought lasted until the Nativity of the Virgin [8 September]; and from then until the Purification [2 February 1385], with the exception of a few days, it rained continuously. In the course of the summer the larger cattle died in very great numbers through the shortage of water.

Sea flood December 1287
John of Oxnead: [...] The abbey also of St. Benedict of Hulme, for example, was entered by the river which stretched around its walls [...] the buildings in lower situations, the aforesaid river filled up to such a degree that small boats were taken into the middle of them [...].

Johannis de Oxenedes Chronica, RS, London 1859, 270.

Fig. 6. Lamb, H.H., Climate. Present, Past and Future, vol. 2, London and New York 1977,
Administrative sources

1. Advantages
   - regular and frequent (annual, monthly etc.), contemporary and continuous information
   - permit the creation of long series
   - information on normal years
   - information for all seasons possible

2. Problems
   - uneven spatial and temporal distribution
   - unpublished sources - work and time intensive data collection
Administrative Sources

Manorial Accounts

Fig. 8. Titow, J., Winchester Yields. A Study in Medieval Agricultural Productivity, Cambridge 1972, p. 38.

Fig. 9. Sedgeford 1423-4, NRO DCN 60-33-31
Administrative Sources

*Manorial Accounts – Pipe Rolls of the Bishopric of Winchester*

**1352 summer:**

*Exitus manerii:*
De agnis agistatis cum agnis domini ... nichil quia reservatur pro agnis domini hoc anno propter siccitatem temporis. (Knoyle)
De pastura estivali in bosco de Pillingebere ... et non plus quia pastura ibidem ardebatur per magnum calorem solis durantem per totam estatem. (Wargrave: Billingbear)

*Repairs to the ploughs:*
Tantum hoc anno propter magnum siccitatem durantem per totam estatem. (Wargrave, Waltham St. Lawrence)

*Falcatio:*
De prato de ... falcando et levando nichil hoc anno quia non falcatur propter calorem et siccitatem in estate. (Wargrave)

*Custus autumpni:*
Tantum hoc anno quia blada quadragesimalia curta fuerunt et male creverunt propter siccitatem. (Farnham)
Indexing the Medieval Climate

Temp indices (-3 through +3) produced for seasons based on Euro-ClimHist event catalogues as follows:

- 0 for „average“ seasons
- -1/+1: seasons only scantily documented with narrative information or seasons including contrasting („warm“ and „cold“) months
- -2/+2: seasons including 2 „cold“ or „warm“ months or being documented with proxy data from individual or institutional sources
- -3/+3: seasons including 3 „cold“ or „warm“ months or extreme conditions being documented with proxy data from individual or institutional sources
### Table 6.3 continued

| Year | Winter | Autum | Spring | Summer | Autumn | Winter | Autum | Spring | Summer | Autumn | Winter | Autum | Spring | Summer | Autumn |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1473 | -2     | -2     | -2     | -2     | -2     | 2      | 2      | 2      | 2      | 2      | -2     | -2     | -2     | -2     | -2     | -2     |
| 1474 | -2     | -2     | -2     | -2     | -2     | 2      | 2      | 2      | 2      | 2      | -2     | -2     | -2     | -2     | -2     | -2     |
| 1475 | -2     | -2     | -2     | -2     | -2     | 2      | 2      | 2      | 2      | 2      | -2     | -2     | -2     | -2     | -2     | -2     |
| 1476 | -2     | -2     | -2     | -2     | -2     | 2      | 2      | 2      | 2      | 2      | -2     | -2     | -2     | -2     | -2     | -2     |
| 1477 | -2     | -2     | -2     | -2     | -2     | 2      | 2      | 2      | 2      | 2      | -2     | -2     | -2     | -2     | -2     | -2     |
| 1478 | -2     | -2     | -2     | -2     | -2     | 2      | 2      | 2      | 2      | 2      | -2     | -2     | -2     | -2     | -2     | -2     |

Fig. 10. Ogilvie, A., Farmer, G., Documenting the Medieval Climate, in: Climates of the British Isles. Present, Past and Future, ed. by M. Hulme and E. Barrow, London and New York 1997, 112-33, Tab. 6.3.
Fig. 11. Ogilvie, A., Farmer, G., Documenting the Medieval Climate, in: Climates of the British Isles. Present, Past and Future, ed. by M. Hulme and E. Barrow, London and New York 1997, 112-33, Tab. 6.3.
Reconstructing the Medieval Climate
April-July mean temperatures, East Anglia

Using the grain harvest date in East Anglian manorial accounts 1256-1431

- Norwich Cathedral Priory
- St Benet’s Abbey of Hulme
- St Giles’s Hospital, Norwich

Fig. 12. Norfolk and East Anglia
Fig. 13 Distribution of the medieval manors

45 manors used in this study; most manors are situated in Norfolk and were in the hand of the Norwich Cathedral Priory.

Accounts checked: c. 1000
Medieval Norfolk

Harvest dates

Fig. 14. Norfolk harvest dates 1256-1431, number per year. Total: 616
Harvest Date and Harvest Duration in the Manorial Accounts

Hindolveston 1323, harvest account:

Fig. 15. Harvest account of Hindolveston account 1323, NRO DCN 60/18/23

Beginning: Monday, Assumption of the Blessed Virgin Mary, 15th August
End: Monday before the feast day of the Apostle Matthew, 19th September
Duration: 5 weeks 1 day

Dates given in Julian Calendar style
Norfolk Composite Harvest Date Series

Fig. 16. Distribution of the medieval manors

Northwest Region gives longest and most continuous data

Other regions put in hierarchical order based on their correlation with the Northwest Region.

Data of other regions transformed to the level of the Northwest Region.
Location of the Eighteenth-Nineteenth Century Comparison Series

Fig. 17. Distribution of the modern comparison series (18th-19th century) and the medieval manors.

Four 18th-19th century comparison series:
- Langham
- Fritton
- Snnettisham
- Wymondham
Beginning of the Grain Harvest: Modern Comparison Series

Fig. 18. Beginning of the grain harvest in Langham, Morningthorpe and Snettisham
Langham (1768-1816)

Beginning of the Grain Harvest

Fig. 19. A scatterplot showing the relationship between grain harvest date at Langham (1768-1816) and mean April-July temperature derived from the CET series. Also shown are the linear regression line and the 95% confidence interval.
Norfolk Temperature Series 1256-1431

April-July Mean Temperatures

Fig. 20. The reconstructed medieval temperature series

The grey error bars represent +/-2 S.E. (RMSE) derived from the regression analysis during the 1768-1816 calibration period. Also shown are the linear trend line and the 11-year Gaussian filtered values of the reconstructed values.

Weather and Mortality

Epidemic disease (plague)

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Fig. 21. Norfolk  April-July mean temperature and epidemic disease.
Last week in Munich, the International Society for Historical Climatology and Climate History was formally registered and held its first official board meeting during the European Society for Environmental History biennial conference (full program here). The new society also inducted its first honorary members: Emmanuel Le Roy Ladurie, Christian Pfister, and Geoffrey Parker. The board discussed links with journals, a publication series, and a projected conference for 2014. The society will open formal membership soon. For now, climatehistorynetwork.com will host the society’s webpage and announcements.

http://climatehistorynetwork.com/2013/08/27/international-society-for-historical-climatology-and-climate-history/