

High Resolution Continental Shelf Model (CS20)



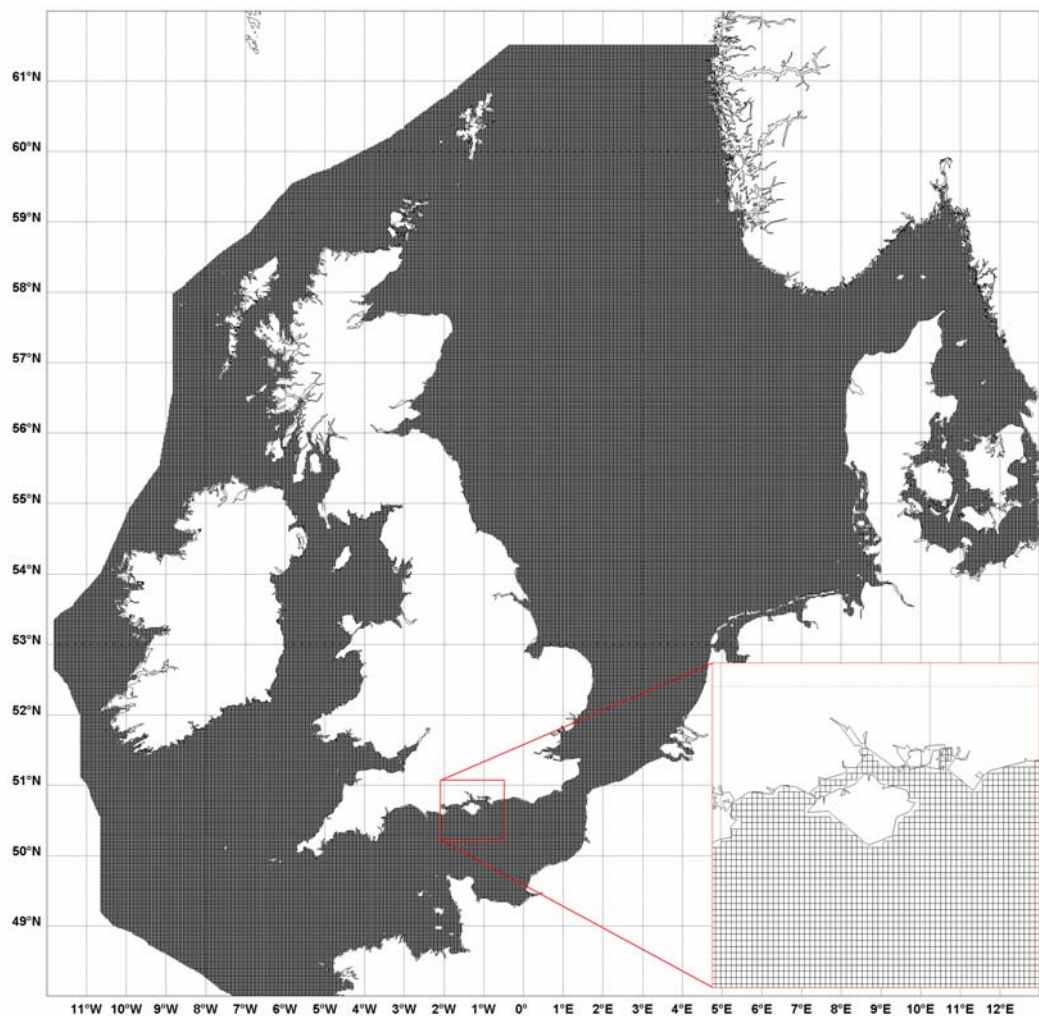
Details

1/60° latitude by 1/40° longitude (horizontal resolution approximately 1 nautical mile (1.8km)).

Area: 12°W-13°E; 48°N-63°N within the 200m depth contour at the continental shelf edge.

Surface and sea-bed (bottom) currents are obtained directly from the 3D model, i.e. taken from the sigma levels adjacent to the sea surface and the sea bed, not deduced from the depth-averaged currents and scaling factors as in the CS3-3D model.

Model grid



References

Proctor, R., C. Bell, L. Eastwood, J. T. Holt, D. Prandle and E. F. Young (2004). UK Marine Renewable Energy Atlas: Phase 2 - POL contribution. Proudman Oceanographic Laboratory, Internal Document, No 163, 26 p.

Continental Shelf Model: fine grid (CS3 and CS3-3D)

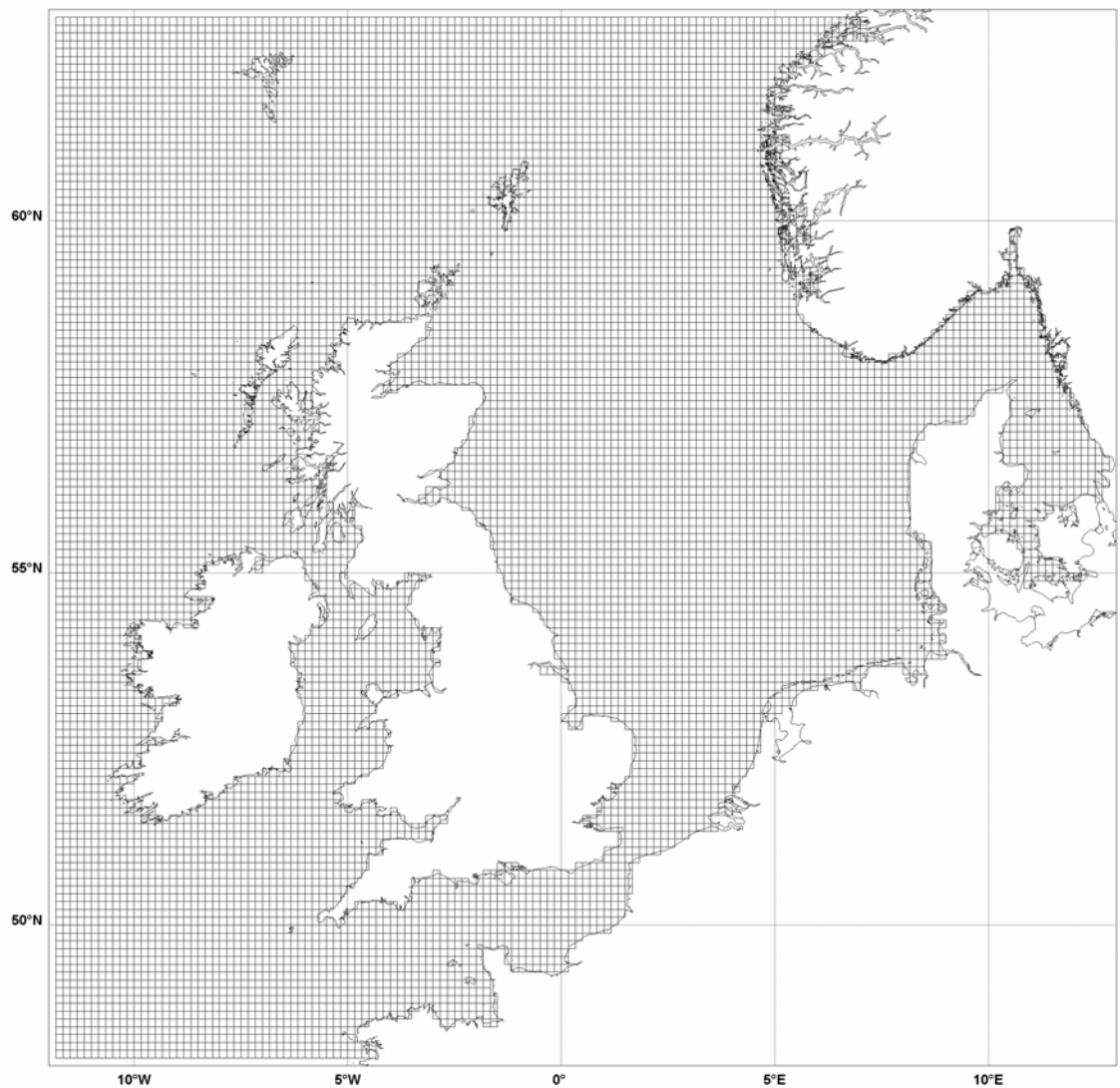


Details

1/9° latitude by 1/6° longitude (resolution approximately 12km)

Area covered: 48° 07'N to 62° 53' N, 11° 50'W to 12° 50'E

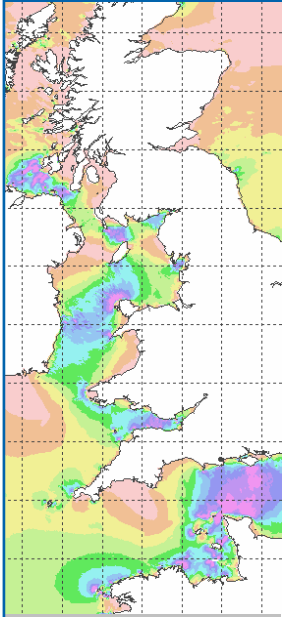
Model grid



References

Smith, J. A. (1994). The Operational Storm Surge Model Data Archive. Proudman Oceanographic Laboratory, Report, No 34, 34pp.

Flather, R. A. and J. A. Williams (2004). Future development of operational storm surge and sea level prediction. Proudman Oceanographic Laboratory, Internal Document, No 165, 69 p.



Flather, R. A., R. Proctor, I. D. James, J. E. Jones, J. A. Smith, A. M. Davies, S. C. M. Kwong, M. W. Holt and J. Davies (1998). "Status of UK operational storm surge forecasting for the NW European Shelf." *Annales Geophysicae*, 16, Supplement II: p.C779.

Williams, J. A. and R. A. Flather (2004). The Operational Storm Surge Model: maintenance, performance and development, January 2003 - March 2004. Proudman Oceanographic Laboratory, Internal Document, No 164, 65 p.

Williams, J. A. and R. A. Flather (2003). The operational storm surge model: development, performance and maintenance during 2002. Proudman Oceanographic Laboratory, Internal Document, No 155, 36 p.

Williams, J. A. and R. A. Flather (2000). Interfacing the operational storm surge model to a new mesoscale atmospheric model. Proudman Oceanographic Laboratory, Internal Document, No 127, 13pp.; figs.

Other data available from the CS3 model

Hindcast of hourly level and current simulations from the POL CS3 Model are available for total (tide and surge) and surge residuals for the years 1992 onwards.

The model makes use of meteorological data from the UK Met Office Operational Storm Surge Local Area Model (1992 to 1997) and the Mesoscale model (1998 onwards). The data being hindcast from the POL CS3 Model using a combination of measured and modelled meteorological data. Surge residual (also known as residual) and total (tide+surge) both have levels and currents (in component form)

Data available from the CS3-3D model

The model uses up to 26 tidal harmonic constants to provide tidal elevation together with current speed and direction at six different depths (sigma levels) deduced from the depth-averaged currents using a set of vertical current profiles. The six sigma levels for the currents are at the depths 0% (surface), 25%, 50% (mid-depth), 75%, 90% (near-bottom) and 100% (bottom).

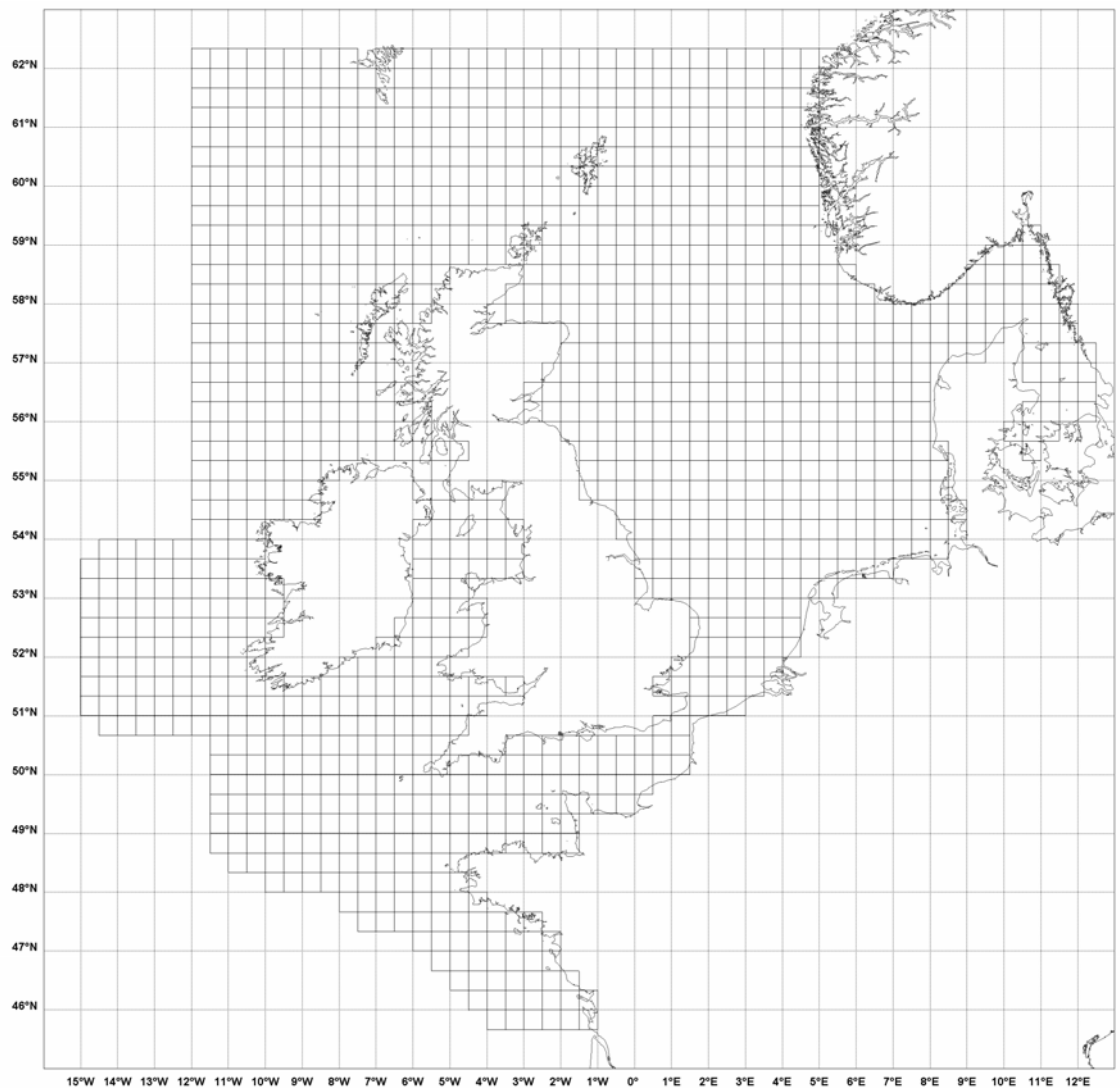
Continental Shelf Model: coarse grid (CSX)

Details

1/3° latitude by 1/2° longitude (resolution approximately 35km)

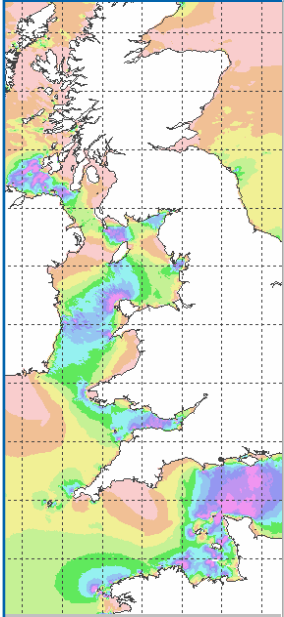
Area covered: 45° 40' N to 62° 20' N, 14° 30' W to 12° 30' E

Model grid



References

Flather. R. A. (1976) A Tidal Model of the North-West European Continental Shelf. Memoires Societe Royale des Sciences de Liege, 6e serie, tome X, pp 141-164.



Flather, R. A. (1981) Practical Surge Prediction Using Numerical Models. in Floods due to High Winds and Tides. Edited by D.H. Peregrine. London: Academic Press for the Institute of Mathematics and its Applications.

Davies, A. M. and Flather, R. A. (1987) Computing Extreme Meteorologically Induced Currents, with Application to the North-West European Continental Shelf. Continental Shelf Research, Vol 7, No. 7, pp643-683.

Flather, R.A., J.A. Smith, J.D. Richards, C. Bell and D.L. Blackman (1998). Direct estimates of extreme storm surge elevations from a 40-year numerical model simulations and from observations. The Global Atmosphere and Ocean System, 6: 165-176.

Other data available from the CSX model

Hourly level and current simulations hindcast for the years 1955 onwards are available for total (tide + surge), Surge only and Tide only.

The model makes use of meteorological data supplied by the Norwegian Meteorological Institute. Note that the model does not include baroclinic effects.

Estimates of Extreme Surge Levels or Total Water Levels with Return Period 2, 5, 10, 20, 50, 100, 200, 500 and 1000 years

These estimates are derived from surge levels **or** total (tide+surge) water levels hindcast by the POL CSX Continental Shelf Model for the 40 year period 1955-1994

Other data available from the CSM model

Estimates of Extreme Tide / Surge and Total Still Water Levels and Depth-Mean Currents . Report on 50 year returns

This data set has estimates of extreme surge currents, albeit only the 50 year return period.

North East Atlantic Model (NEA)

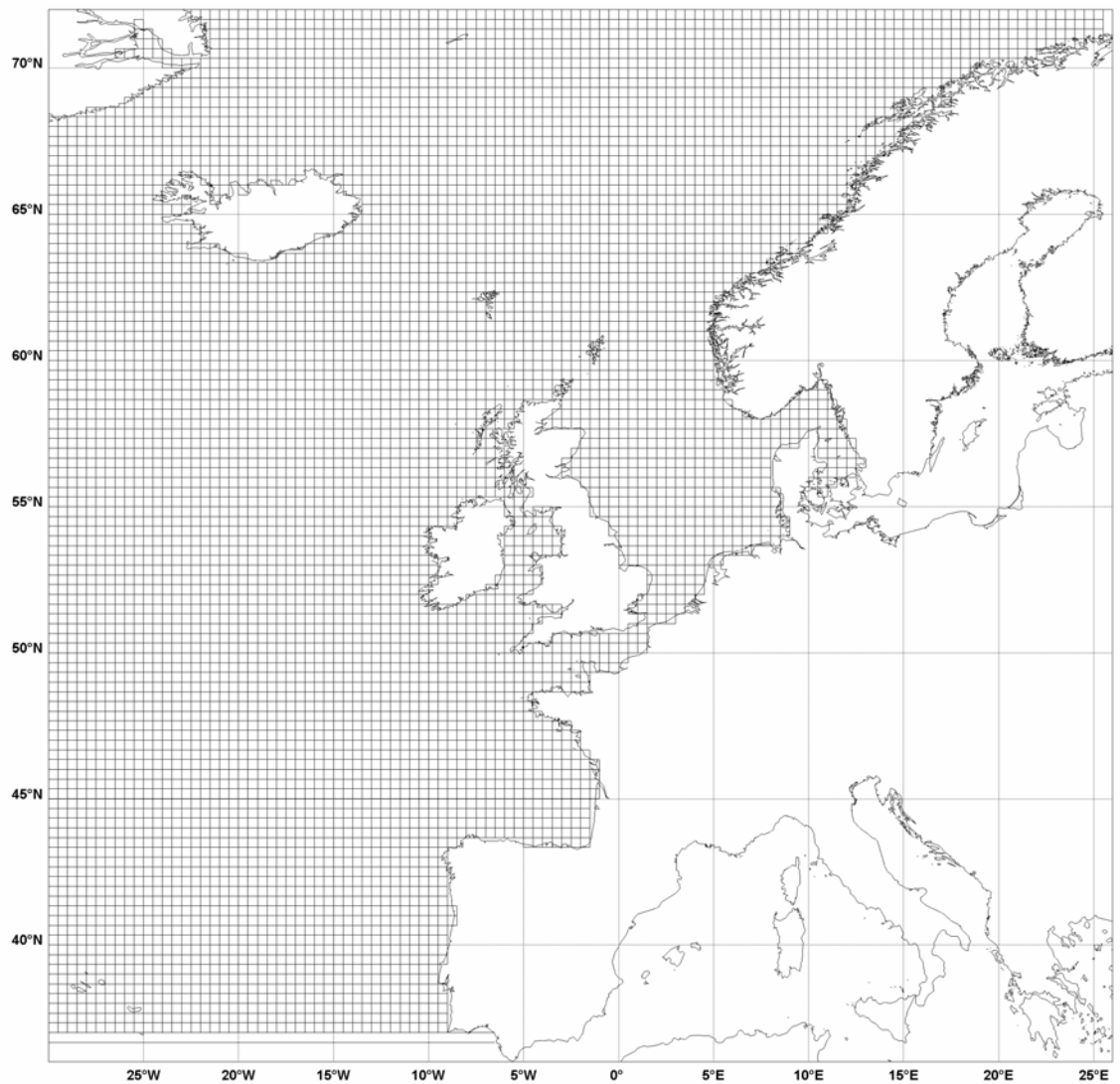
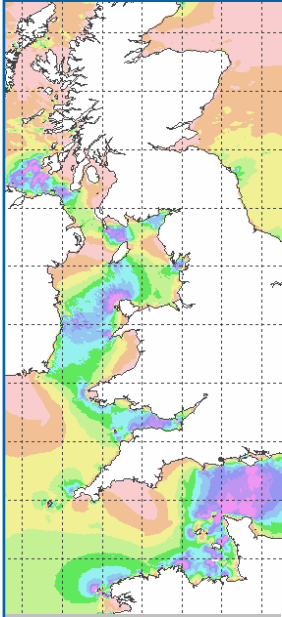


Details

1/3° latitude by 1/2° longitude (resolution approximately 35km)

Area covered: 37° 00' N to 71° 40' N, 30° 00' W to 25° 30' E

Model grid



Eastern Irish Sea Model (EIS)

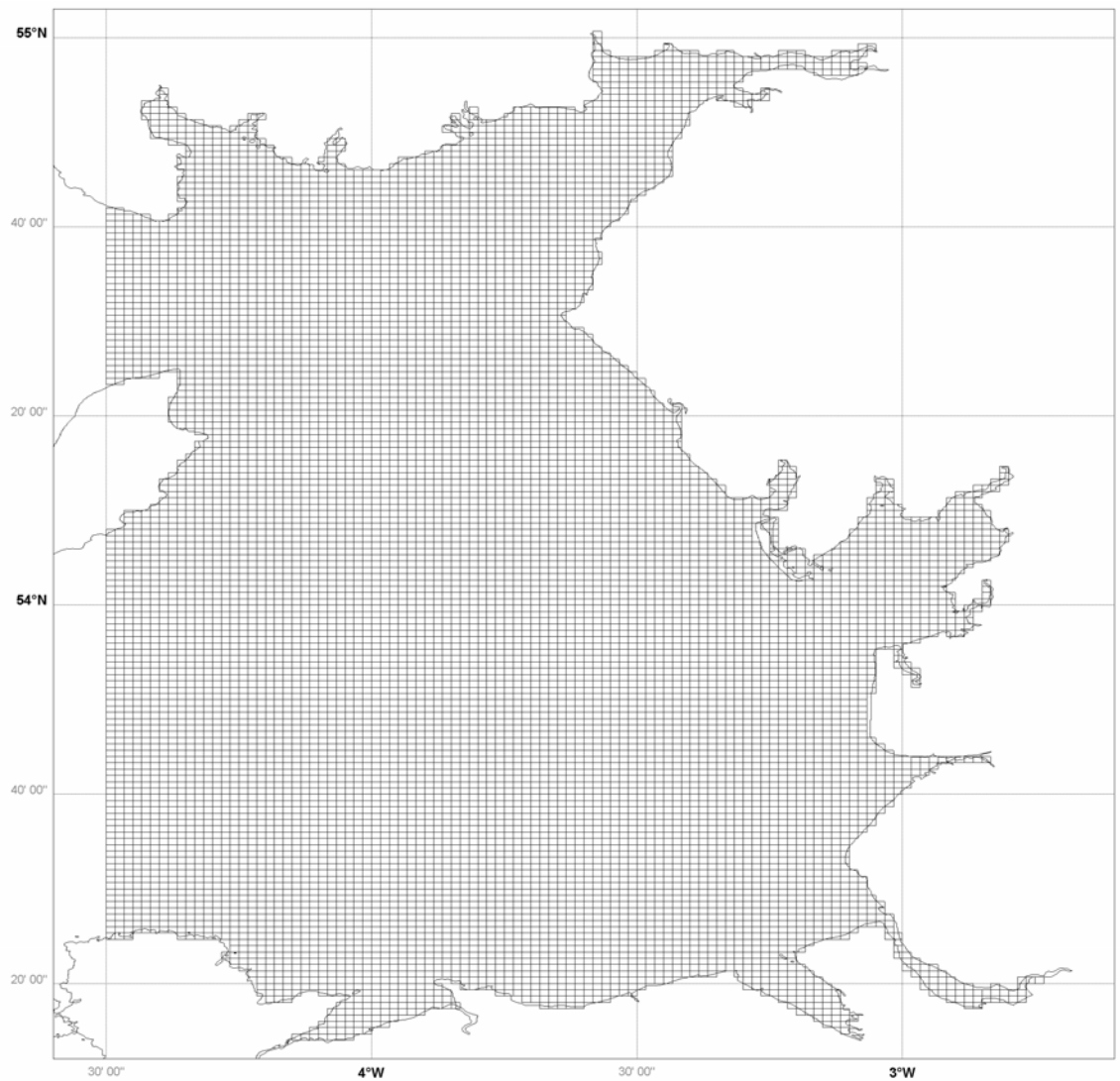


Details

1/90° latitude by 1/60° longitude (resolution approximately 1.2km)

Area covered: 53°12'N to 55°00'N, 04°30'W to 02°48'W

Model grid



English Channel Model (ECH)

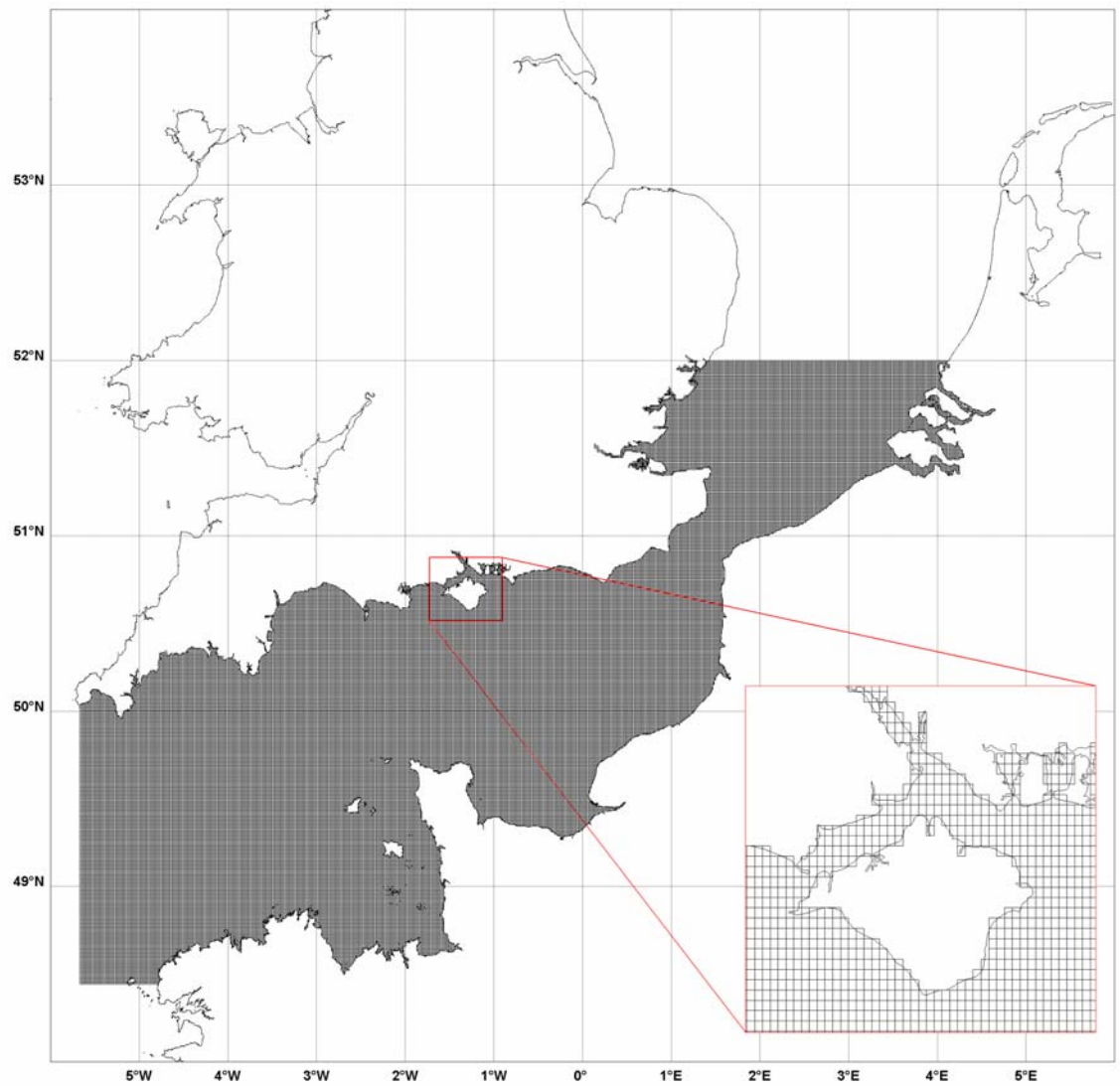


Details

1/90° latitude by 1/60° longitude (resolution approximately 1.2km)

Area covered: 48°26'20"N to 52°00'21"N, 05°40'30"W to 04°39'28"W

Model grid



Orkney Model (ORKM)

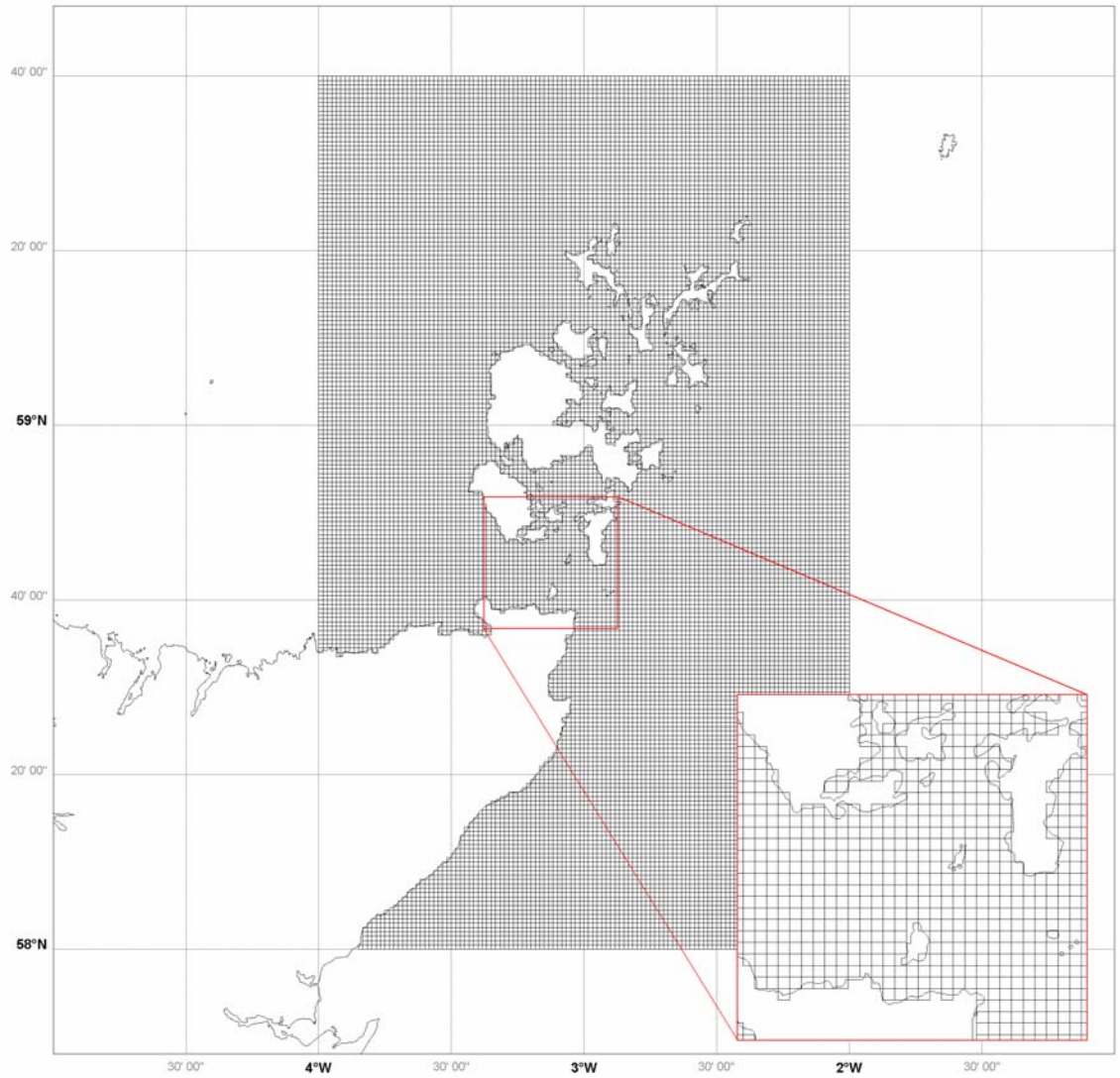


Details

1/120° latitude by 1/60° longitude (resolution approximately 1km)

Area covered: 58°N to 59°40'N, 04°00'W to 02°00'W

Model grid



Bristol Channel Model (BCM)

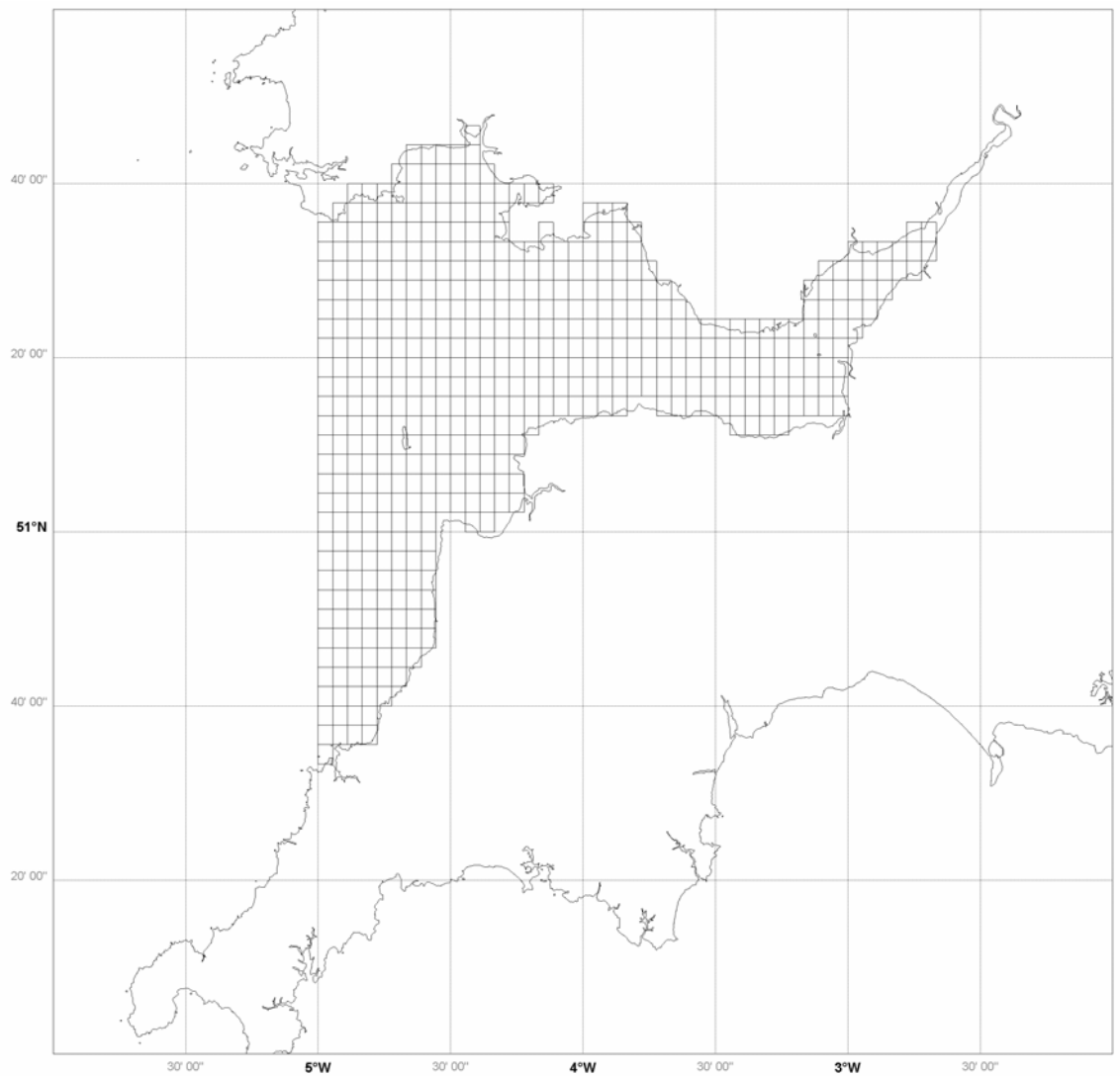


Details

1/27° latitude by 1/18° longitude (resolution approximately 4km)

Area covered: 50°33'20"N to 51°46'40"N, 05°00'W to 02°40'W

Model grid



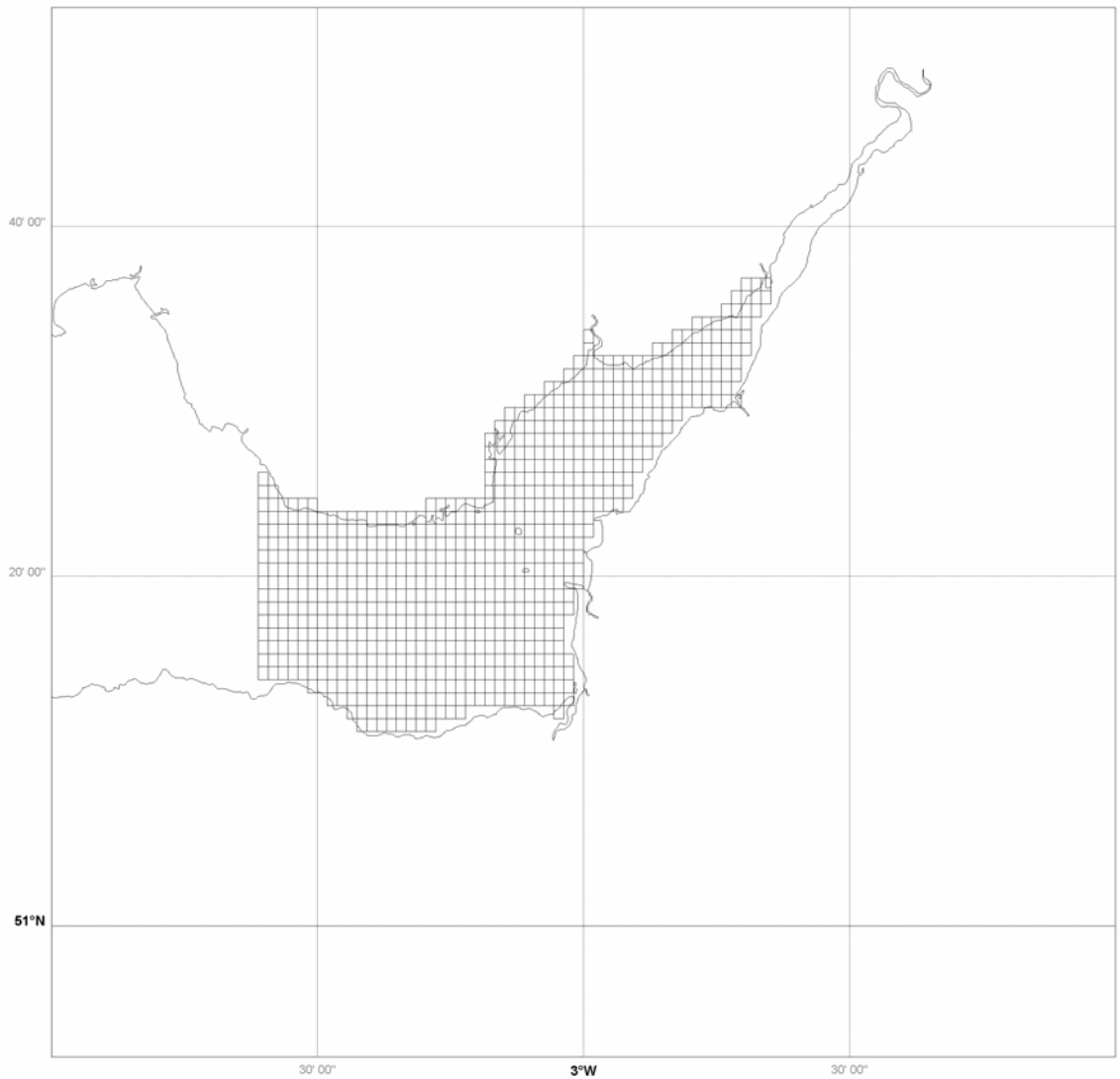
Severn Estuary Model (SEM)

1/81° latitude by 1/54° longitude (resolution approximately 1.3km)

Area covered: 51°11'6.6"N to 51°46'40"N, 03°36'40"W to 02°26'40"W



Model grid



Mediterranean Model (MED-a, MED-b, MED-c)



Details

1/12° latitude by 1/12° longitude (resolution approximately 9.2km lat, 6.5-8km lon)

Area covered: 45°50'N to 30°25'N, 5°35'W to 36°10'E

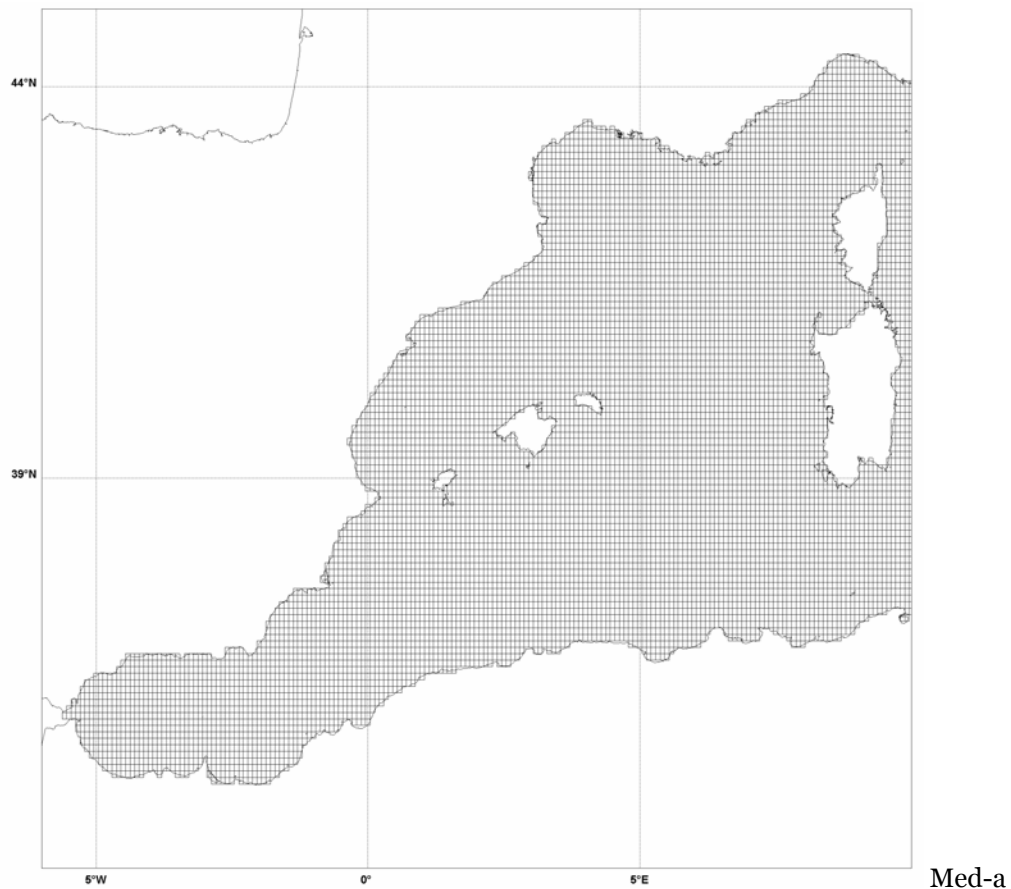
For ease of use in our DLL and POLPRED software, we split the Mediterranean Model into 3 standard regions. The 3 regions can be approximately defined as:

Med-a: 6°W-10°E Med-b: 8°E-23°E Med-c: 21°E-37°E

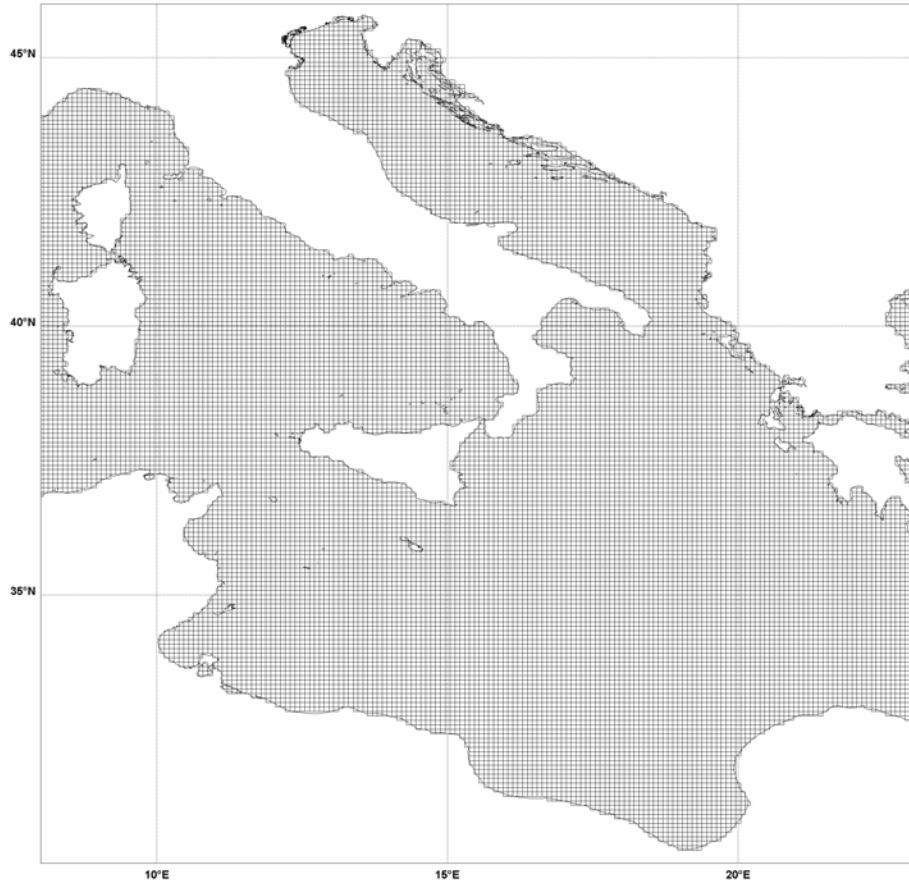
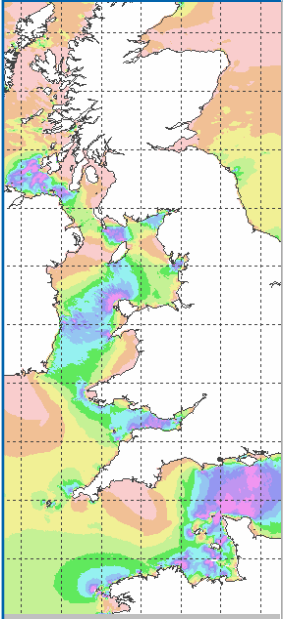
Reference

Tsimplis M.N., Proctor R. and Flather R.A.(1995) *Two-dimensional model for the Mediterranean Sea* JGR-Oceans.

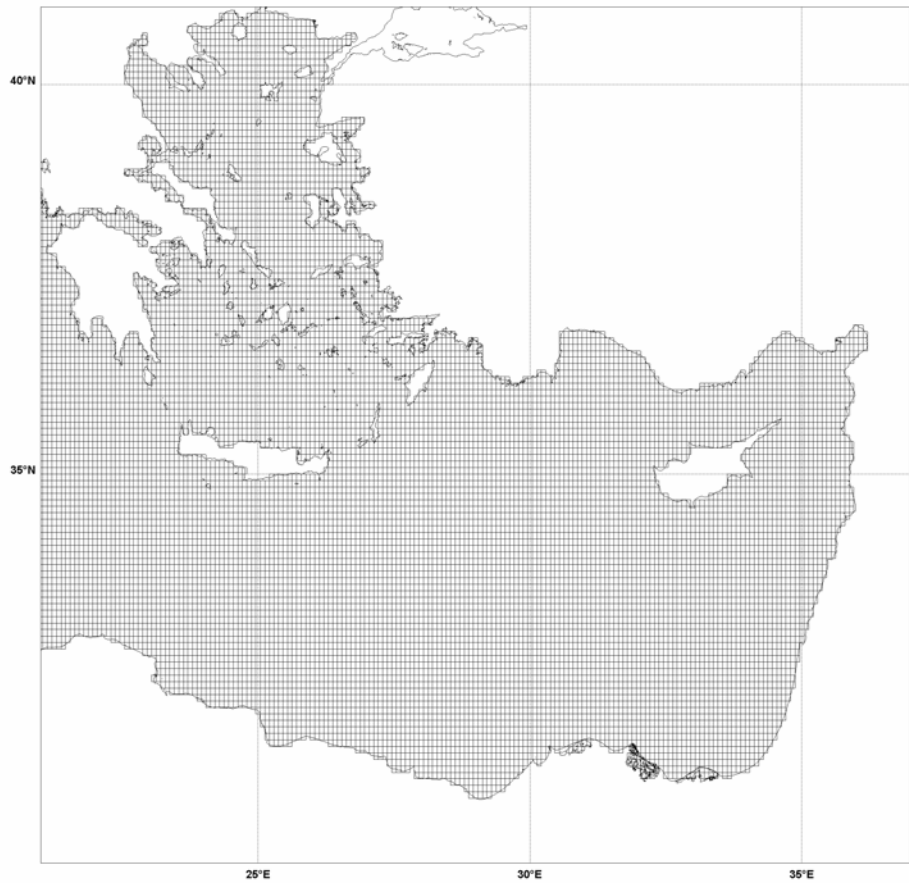
Model grids



Information Sheet



Med-b



Med-c

Arabian Gulf Model (GULF)

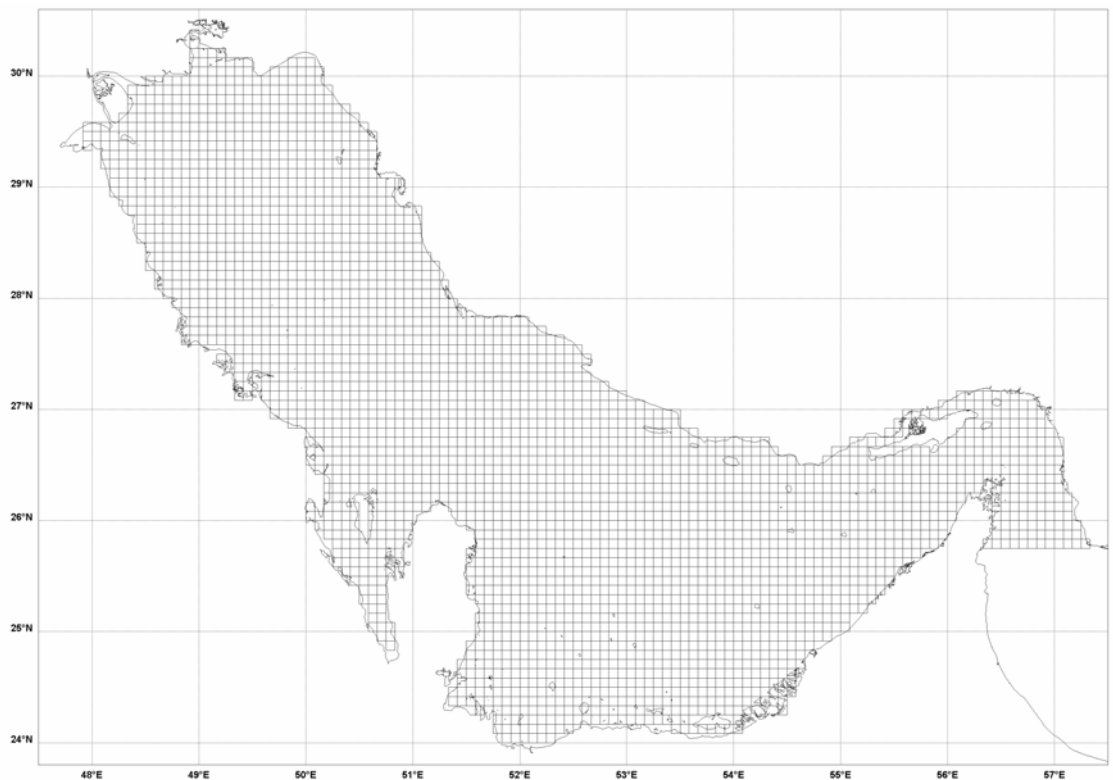


Details

1/12° latitude by 1/12° longitude (resolution approximately 9km)

Area covered: 24°00'N to 30°25'N, 47°45'E to 57°20'E.

Model grid



References

Proctor, R., Flather, R. A. and Elliot, A. J. (1994) Modelling Tides and Surface Drift in the Arabian Gulf - Application to the Gulf Oil Spill. *Continental Shelf Research*, Vol 14, No 5, pp 531-545,

Proctor, R., Elliot, A. J. and Flather, R. A. Predictions and Observations of Arabian Gulf Oil Slick. *J.N.S*, Vol 17, No 4.

Patagonian Shelf Model (PATG)

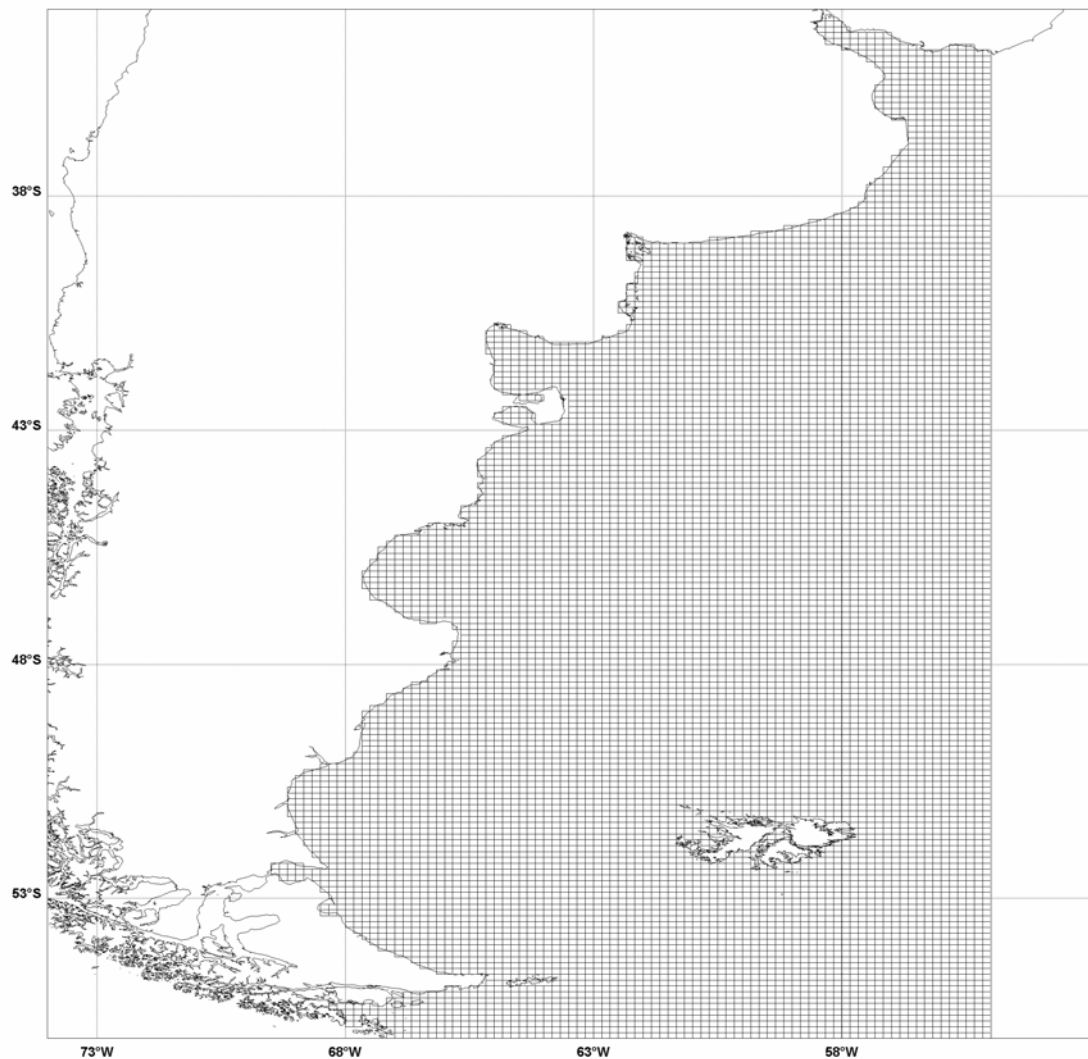


Details

1/8° latitude by 1/6° longitude ((resolution approximately 13km at 45°S))

Area covered: 34°00'S to 56°00'S, 55°00'W to 70°00'W

Model grid



References

Davies A.M., S.C.M. Kwong and R.A. Flather (1997) **Formulation of a variable-function three-dimensional model, with applications to the M_2 and M_4 tide on the North-West European Continental Shelf.** *Continental Shelf Research*, 17, 165-204.

Glorioso P.D. and R.A. Flather (1997) **The Patagonian Shelf tides.** *Progress in Oceanography*, 40, 263-283.