Regional Scale Observations and Modelling for Arkona Sea

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Contents

- Automatic permanent observations.
- Baltic Sea monitoring by IOW.
- QuantAS research cruises.
- Numerical modelling with GETM.
- Modelling strategy.
MARNET Stations

MARNET: Marine Monitoring Network of the BSH

DS: Darss Sill
AS: Arkona Sea
OD: Oder Bank

For more information, see IOW posters and website
Arkona Sea Buoy

Foto by IOW
Darss Sill Buoy

Foto by IOW
Darss Sill Data 1993

![Temperature and Salinity Graphs](image)

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QuantAS-Off Kick-Off Meeting, Warnemünde (Germany), Jan. 10-11, 2005 – p. 6/16
FRV Station online data

FRV: The Royal Danish Administration of Navigation and Hydrography

SMHI Station online data

SMHI: Swedish Meteorological and Hydrological Institute

Temperature and Salinity in Öresund  01-Jan-2005 - 07-Jan-2005

From http://www.smhi.se/hfa_coord/BOOS/inflow_quarter.html
IOW Monitoring Cruises

Location of Baltic Sea Section

TRANSECT - Kiel Bight - Gotland Sea

Depth in m

Gotland Deep

Stockholm

Gotland

SCHWEDEN

DENMARK

GERMANY

POLAND

Kiel

Rostock

Ystad

Darss Sill

Arkona Basin

Bornholm Basin

Stolpe Channel

Bornholm

Gdynia
Cross section: salinity

→ See presentation by Rainer Feistel (IOW).

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QuantAS Research Cruises

  → See presentation by Jürgen Sellschopp (FWG).

- Extra sections to Arkona Sea by IOPAN: Jan 2004.
  → See presentation by Jan Piechura (IOPAN).


FWG cruise

From January 26 to February 13, 2004, FWG Kiel organised a research cruise into the Arkona Sea. Luckily, an inflow event occurred during this period.

Accumulated flux over Drogden Sill

Calculated from sea level differences according to Jakobsen et al. [1997]
In January 2004, IOPAN made a number of CTD sections in the Arkona Sea. One resulting salinity cross section is shown below:
Regional modelling with GETM

GETM has bottom- and surface-fitted coordinates

GETM uses GOTM (General Ocean Turbulence Model)

GETM has high accuracy for matter transport.

GETM runs on parallel computers.

→ See the presentation by Karsten Bolding.
Idealised results with GETM

Simulation of salt water intrusion through the Sound over Drogden Sill. Shown is bottom salt concentration during passage of salt plume towards Bornholm Sea.

→ See the presentation by Hans Burchard.
Model strategy

- Three-dimensional idealised modelling of Arkona Sea.
- One-dimensional studies of sheared stratified flow.
- Realistic modelling of Arkona Sea and adjacent waters.
- Model validation and calibration.
- Parameterisation of offshore wind farm impact (with results from small-scale modelling & lab studies).
- Prediction of wind farm influence for Arkona Sea.
- Prediction of wind farm influence on larger scale (Bornholm Sea, Baltic Sea).
- Sensitivity studies with various wind farm layouts, distributions and extensions.
- Risk assessment by means of several case studies.