



BALTEX

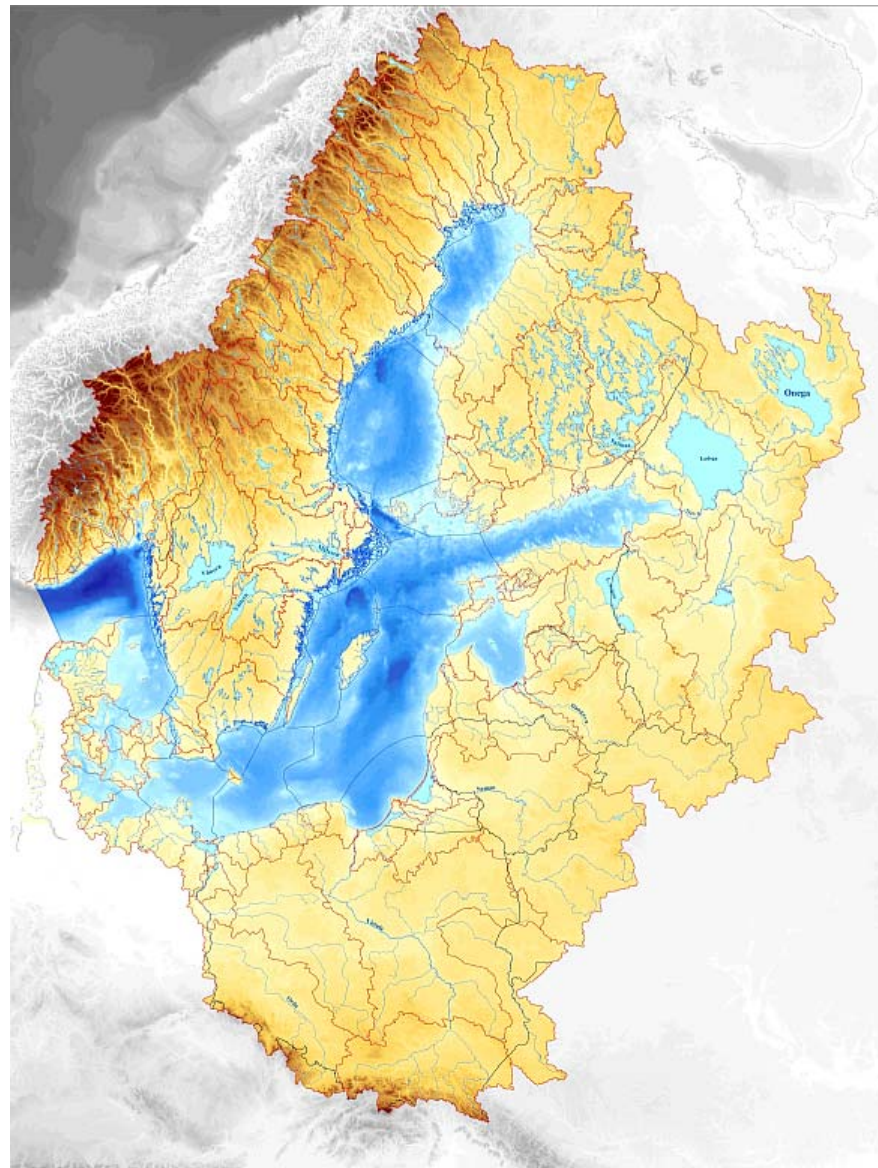
The Baltic Sea Experiment

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www.baltex-research.eu

2nd CEOP Annual Meeting, Geneva, Switzerland
15-17 September 2008



- Basin: 2.13 Mill. km²
- Baltic Sea: 380 000 km²
- 85 million in 14 countries
- Variable climate and topography
- Considerable seasonal, inter-annual, decadal and long-term variations
- Unique, challenging region for climate and environmental studies (data, models and observations, budgets)
- Environmental issues of concern

A: Background BALTEX and GEWEX Phase II Objectives



Objectives 1 and 2

1. Better understanding of the **energy and water cycles** over the Baltic Sea basin

Objectives 1 and 2

2. Analysis of **climate variability and change** since 1800, and provision of regional climate projections over the Baltic Sea basin for the 21st century

Objectives 3 and 4

3. Provision of improved tools for **water management**, with an emphasis on more accurate **forecasts of extreme events** and long-term changes

Beyond GEWEX

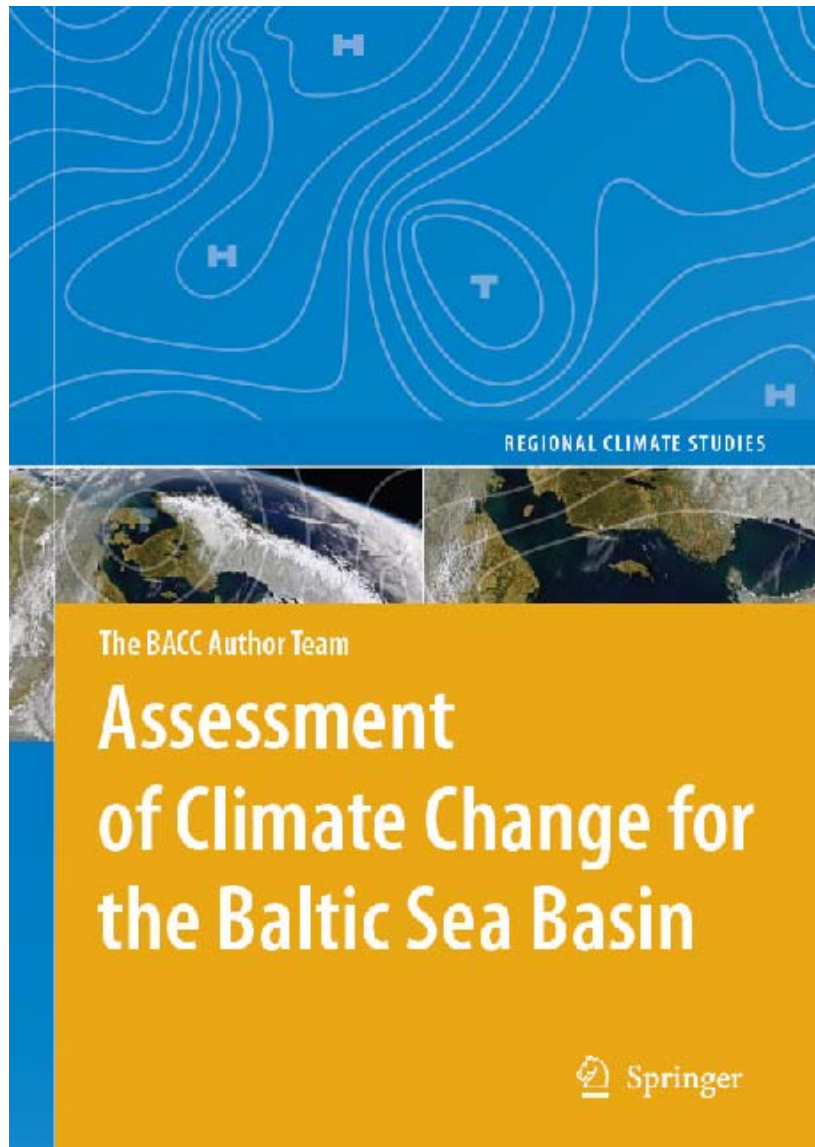
4. Gradual extension of BALTEX methodologies to **air and water quality** studies

Objective 4

5. Strengthened **interaction with decision makers**, with emphasis on global change impact assessments

6. **Education and outreach** at the international level

B: Major past year's activities and achievements



BACC Book published in January 2008

Major scientific review of peer-reviewed literature on climate change in the Baltic Sea basin: Past, future and potential impacts on ecosystems and human activities

Stakeholder involvement: HELCOM report

Enormous press resonance: in Germany over 100 newspaper and online articles, radio and TV reports, interviews

B: Major past year's activities and achievements



Preparation of a Special Proceedings Issue in BER on the 6th Study Conference on BALTEX on Saaremaa, Estonia, 4-8 June 2007

Due for publication in late 2008 or early 2009
26 manuscripts submitted – 24 papers accepted

- “Regionalisation of the precipitation pattern in the Baltic Sea drainage basin and its dependence on large-scale atmospheric circulation” – Jaagus (Objective 1)

Highlights / Examples

- “Highlights of physical oceanography of the Gulf of Finland reflecting potential climate changes” – Soomere et al. (Objective 1 and 2)
- “Changes in the water budget in the BALTEX area in future warmer climates as simulated in a regional climate model” – Kjellström and Lind (Objectives 1 and 2)
- „Consistency of observed temperature trends in the Baltic Sea catchment area with anthropogenic climate change scenarios“ – Bhend and von Storch (Objective 2)
- „Simulating river flow to the Baltic Sea from climate simulations over the past millenium“ – Graham et al. (Objectives 2 and 3)
- Storm surges in the Odra mouth area in the 1997-2006 decade - Kowalewska-Kalkowska, H., B. Wiśniewski (Objective 3)
- “Atmospheric input of nitrogen to the Baltic Sea basin - Present situation, variability and impact of climate change” – Langner et al. (Objectives 2 and 4)

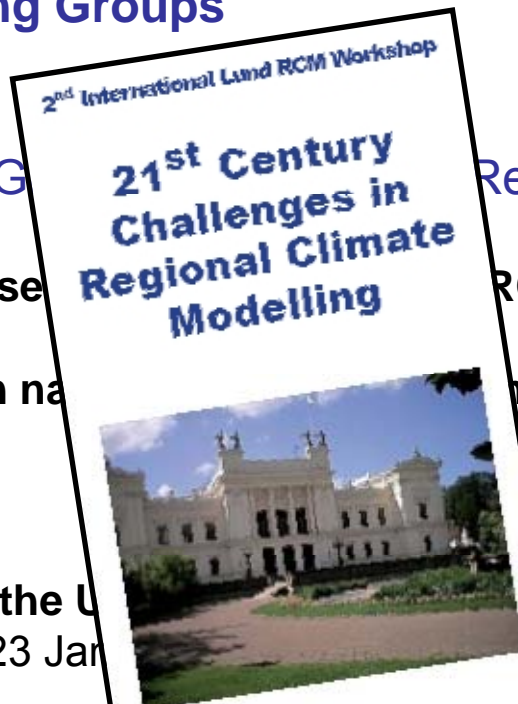
B: Major past year's activities and achievements



New BALTEX Working Groups

(1) BALTEX Working Group on Regional Climate Models (RCMs)

- Evaluate and make use of RCMs as opposed to a global model framework
- discriminate between natural and anthropogenically induced climate change



Regional Climate Models (RCMs)

RCMs as opposed to a global model framework

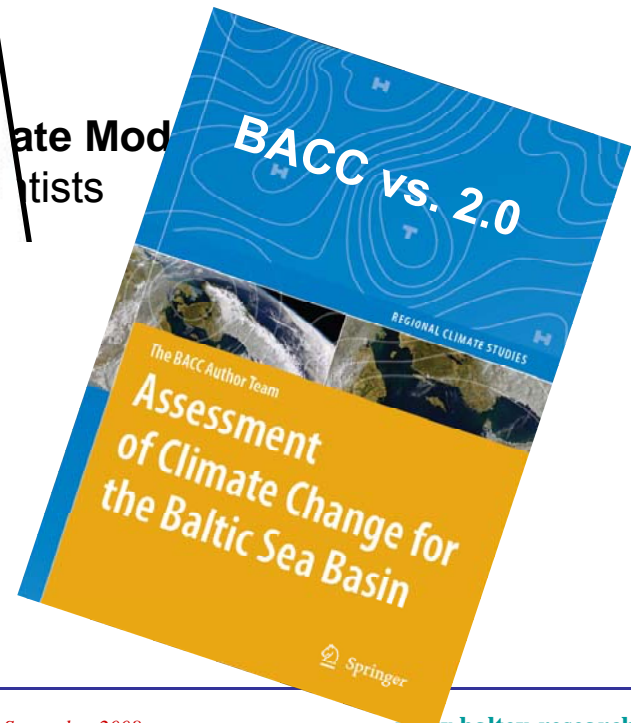
discriminate between natural and anthropogenically induced climate change

BALTEX Workshop on the Use of RCMs
at SMHI, Norrköping, 23 Jan

ate Mod
tists

(2) BALTEX Working Group on BACC II

- Continuation of the BACC work
- Aiming for a new assessment report in 5 years



B: Major past year's activities and achievements



€€€ Successful „fundraising“ for 2 BALTEX projects €€€

BONUS+ Call launched on September 17th, 2007



- includes both national and EC funds
- objective is to create a coordinated joint Baltic Sea research programme for the Baltic Sea (including its drainage basin)
- focus is on supporting an ecosystem-based approach to management of human activities
- 149 Letters of Intent, 55 asked for a Full Proposal, 16 will be funded
- 2 of 3 BALTEX-coordinated proposals will be funded
- BALTEX scientists active in several other successful proposals

B: Major past year's activities and achievements



2 successful BALTEX projects funded by BONUS

ECOSUPPORT (coordinated by Markus Meier, SMHI)

„Advanced modelling tool for scenarios for the Baltic Sea ecosystem to support decision making“

How will the Baltic Sea ecosystems change under future climate conditions?

Development of a **multi-model system tool** based upon scenarios from an **existing state-of-the-art coupled atmosphere-ice-ocean-land surface model** for the Baltic Sea catchment area, **physical-biogeochemical models** of differing complexity, a **food web model**, **statistical fish population models**, **economic calculations**, and new data detailing climate effects on marine biota



B: Major past year's activities and achievements



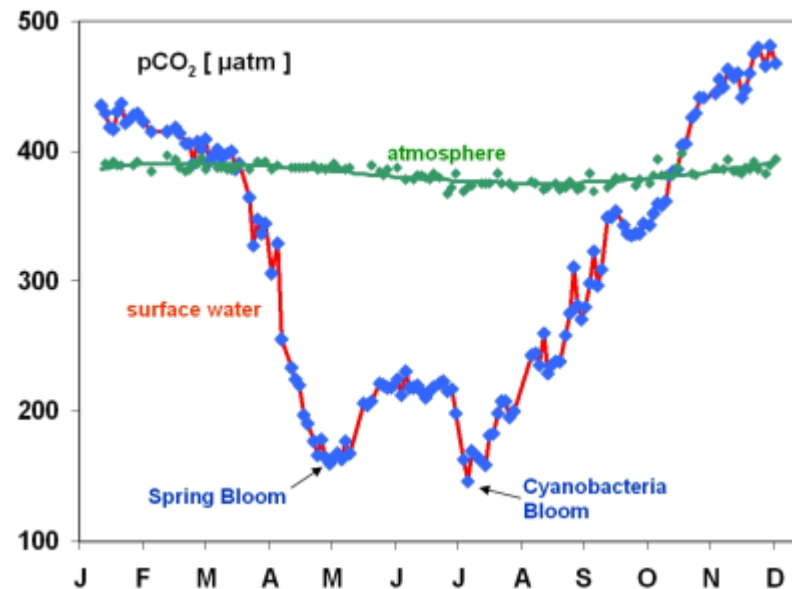
2 successful BALTEX projects funded by BONUS

(2) **BALTIC-C** (coordinated by Anders Omstedt, Göteborg University)

„Building predictive capability regarding the Baltic Sea organic/inorganic carbon and oxygen systems “

Integration of organic and inorganic carbon budgets of the Baltic Sea

Model framework in support of **water management** of the Baltic Sea and its ecosystem, addressing the consequences of **climate change, eutrophication, increasing atmospheric CO₂** and **acid precipitation**, and demonstration applications of the framework of direct value for management



B: Major past year's activities and achievements



Current adjustment of BALTEX Phase II objectives

Rationale: *Review of achievements made adjustments necessary, also in the light of new reseach foci and new BSSG members*

Objective 1: Better understanding of the **energy and water cycles** over the Baltic Sea basin

Objective 3: Provision of improved tools for **water management**, with an emphasis on more accurate **forecasts of extreme events** and long-term changes

Objective 4: Gradual extension of BALTEX methologies to **air and water quality** studies

Draft document available on BALTEX web site

Open discussion until end of 2008

C: Planned activities 2008-2009



4 major international events planned for the coming year

(1) TELLUS - BALTEX Workshop on **Biogeochemical Land and Baltic Sea Interactions driven by Climate and Land Use**

1 - 2 December 2008, Göteborg University, Sweden

www.baltex-research.eu/ (soon!)

(2) 2nd International Lund RCM Workshop on **21st Century Challenges in Regional Climate Modelling**, 4 - 8 May 2009, Lund University, Sweden

www.baltex-research.eu/RCM2009

(3) International Conference on **Climate Change – The environmental and socio-economic response in the southern Baltic region**

25 - 29 May 2009, Szczecin, Poland

www.baltex-research.eu/SZC2009 (soon!)

(4) International Summer School on **Threats and challenges for the Baltic Sea environment under climate change**

Late Summer 2009, Nexø, Bornholm, Denmark

www.baltex-research.eu/ (soon!)

Planned activity 2010



6th Study Conference on BALTEX 2010, Międzyzdroje, Wolin, Poland



www.baltex-research.eu (online soon)



From the BACC book

- Temperatures
- Precipitation
- Wind and Storms

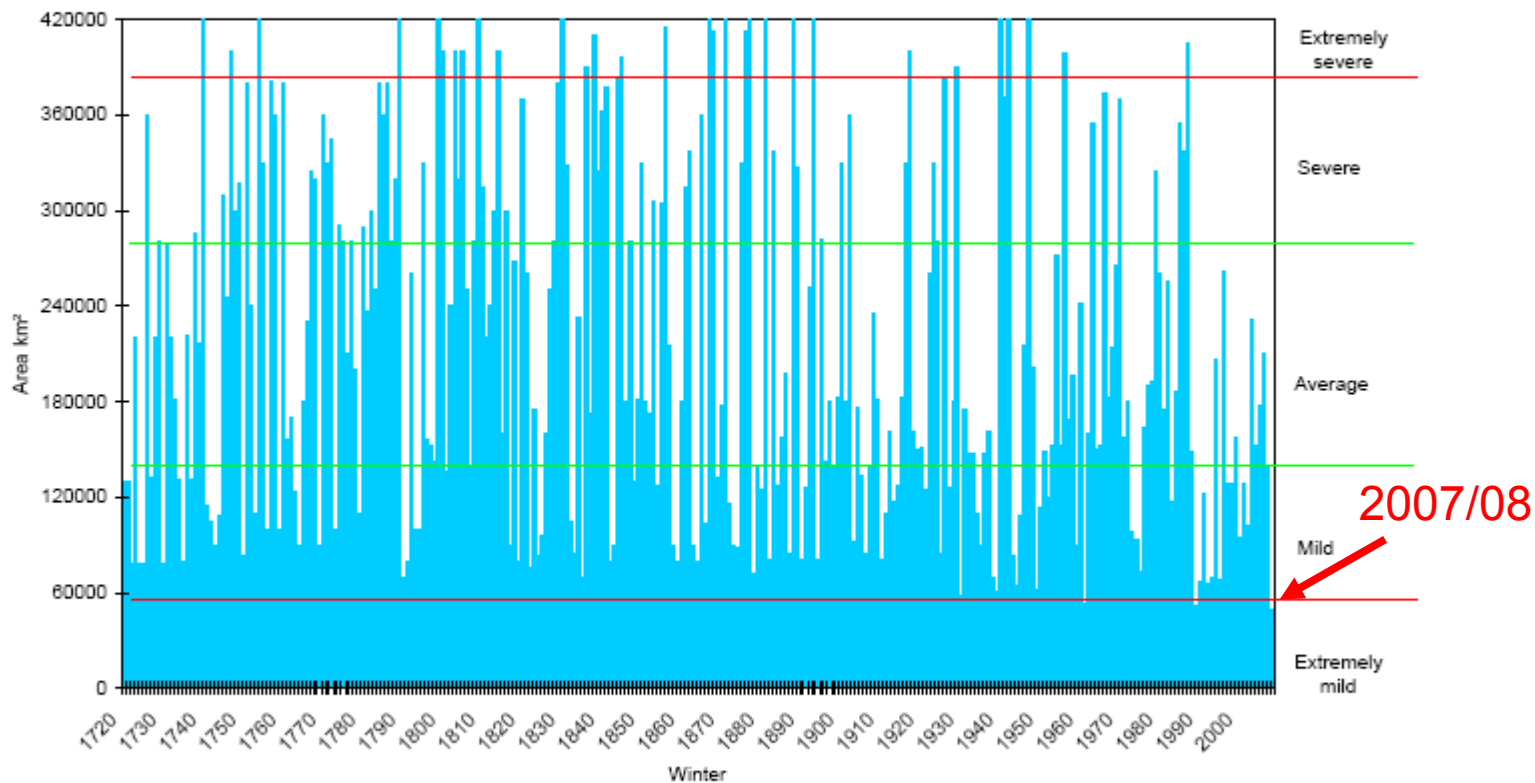
Recent extreme events in the Baltic Sea basin

- Heat and dry spells in Finland
- Record mild ice winter

Extremes: Mildest Baltic Ice Winter on Record 2007/08



THE MAXIMUM EXTENT OF ICE COVER IN THE BALTIC SEA ON THE WINTERS 1719/20 - 2007/08



© FIMR, Ice Service, 2008

modified from Seinä & Palosuo (1996)

Extremes: Mildest Baltic Ice Winter on Record 2007/08

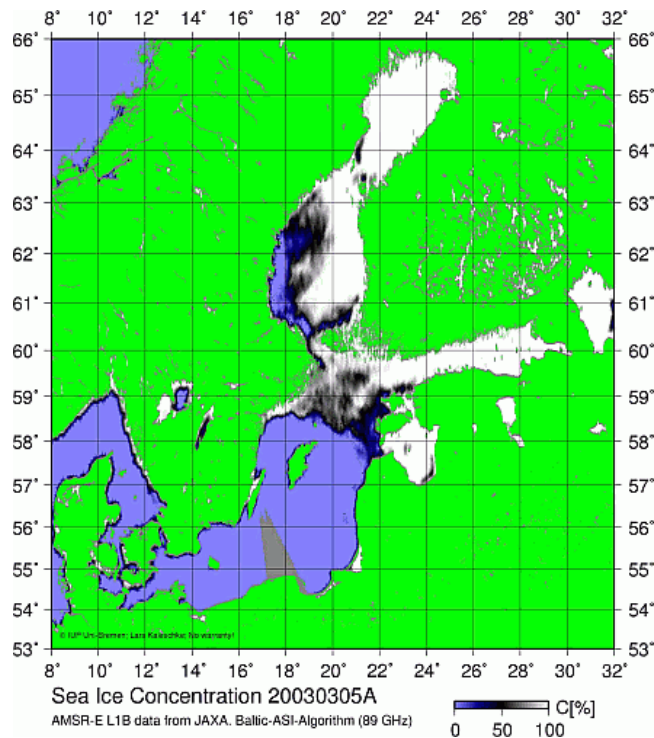


Baltic Sea area: 422.000 km²

Maximum Sea Ice Extent

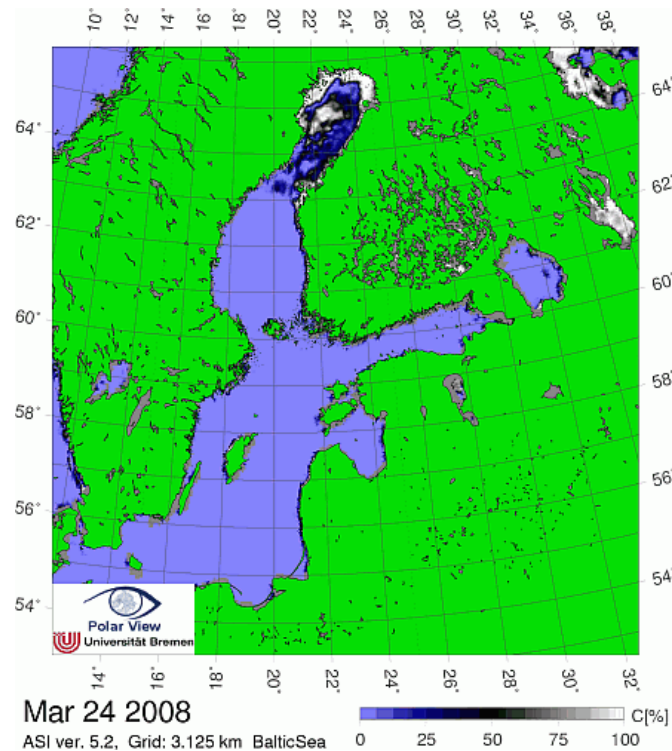
5 March 2003: 232.000 km²

Average winter



24 March 2008: 49.000 km²

Extremely mild winter



Source: AMSR-E sensor on AQUA, maps provided by University of Bremen, Germany
www.iup.uni-bremen.de/iuppage/psa/2001/amsrop.html