

GMES - space weather and global change

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Solar Observations (SO)



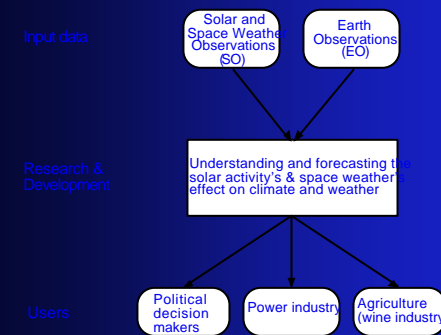
GMES (Global Monitoring for Environment and Security)

- GMES was launched in 1998 and is a joint initiative of ESA and EC, and aims to provide Europe with independent and permanent access to the information flows generated in space crucial to: monitoring the environment; preventing and managing natural or industrial catastrophes; respecting environment commitments and so on.
- GMES shall contribute to our understanding of global change, phenomena such as El Nino (NAO) and processes that put pressure on the environment.
- Sweden has a great interest in GMES. Swedish National Space Board and the Swedish Environmental Protection Agency are the Swedish representatives in the GMES steering Committee. Sweden has participated in the development of the Earth observations satellites ERS-1, ERS-2 and ENVISAT and meteorological satellites Meteosat, MSG and Metop.

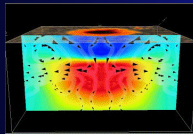
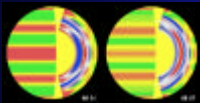
GSE (GMES Service Element)

- GSE was approved in November 2001 by ESA Ministerial Council as a new 5 year ESA programme dedicated to GMES
- It focuses upon delivery of policy-relevant services to end-users, primarily (but not exclusively) - Solar Observations (SO) from EO (Earth Observations).

EO| SACE and GMES



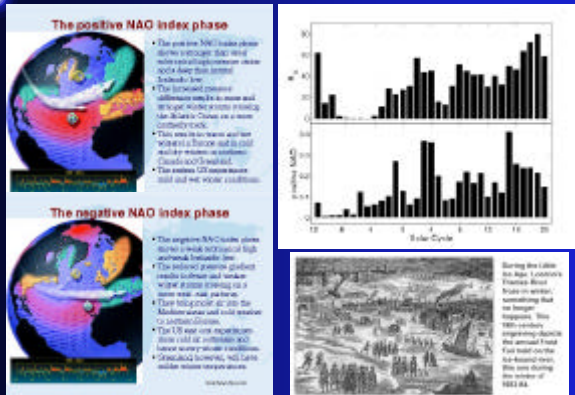
Forecasting solar activity - the real challenge



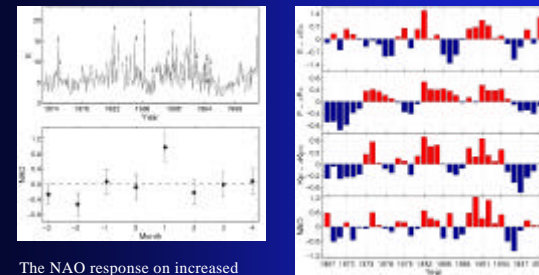
Forecast service package exist



Solar activity and North Atlantic Oscillation



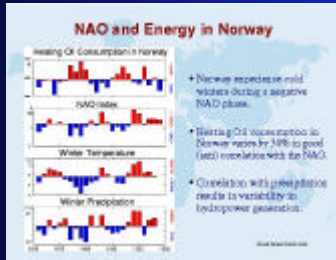
North Atlantic Oscillation and solar wind activity



The NAO response on increased solar wind E, one month later! That makes forecasts one month ahead possible.

11 yrs, 1.3 variations are seen both in solar wind and NAO.

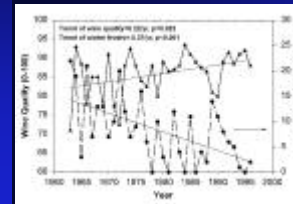
Users of NAO forecasts



Power industry

The power demand of Sydkraft increases e.g. with 50 MW if the temperature decreases with 1 C°

California wine industry and NASA



...the

Report the Impact of the



Wine industry in Europe and ESA, GMES

Nowadays, **Europe** is not only the most important wine producing and exporting region in terms of volume, but also the primary wine-consuming region. Around 70% of the world's vineyards are located in Europe, with about 77% of the produce fermented into wine. Although Spain has the largest area under grape cultivation, Italy and France are the world's major wine producing countries. Both countries annually produce around 60 – 70 million hectolitres each, which accounts for approximately 40% of the world's wine production and 50% of world wine exports.

Collaboration:

- Robert Mondavi (CA/Italy)
- Anjou, Loire Valley France)

Forecasts (NASA/ESA):

of vintage quantity, quality, irrigation and disease incidence.



Summary - Today

- **Document "EoI - Solar Activity and Climate Network (SACE)"**
 - European Solar Climate Network (ESCN)
 - ESA Space Weather Forecast Service Package exist as tool
 - Forecasts of NAO, ENSO and other indicators of climate and weather changes are developed using SO and EO.
- **Users of forecasts of climate changes exist**
 - Power industry (Sydkraft)
 - Agriculture - wine industry (in California 10 billion \$ /year (French, Italian and CA collaboration exist)
- **Services requested**
 - Forecasts of power demand
 - Forecasts of vintage quantity, quality, irrigation and disease incidence.