

Service for Nowcast and Forecast Indices used for Atmospheric Drag Calculation

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Abstract

As part of the ESA SSA Programme's Space Weather segment, we have developed FORIND, a service that provides nowcasts and forecasts of solar and geomagnetic indices needed for atmospheric modelling in support of atmospheric drag calculation. These indices are stored on a dedicated database and can be retrieved, in a custom tailored and homogeneous form, via a web page or a REST interface in CSV and JSON formats or visualized in PNG format. The service has been developed within the ESA SSA SWE activity on "Space Weather

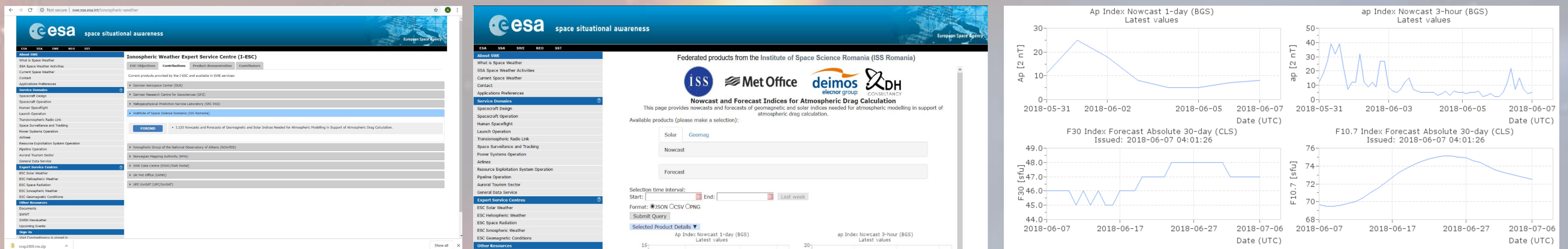
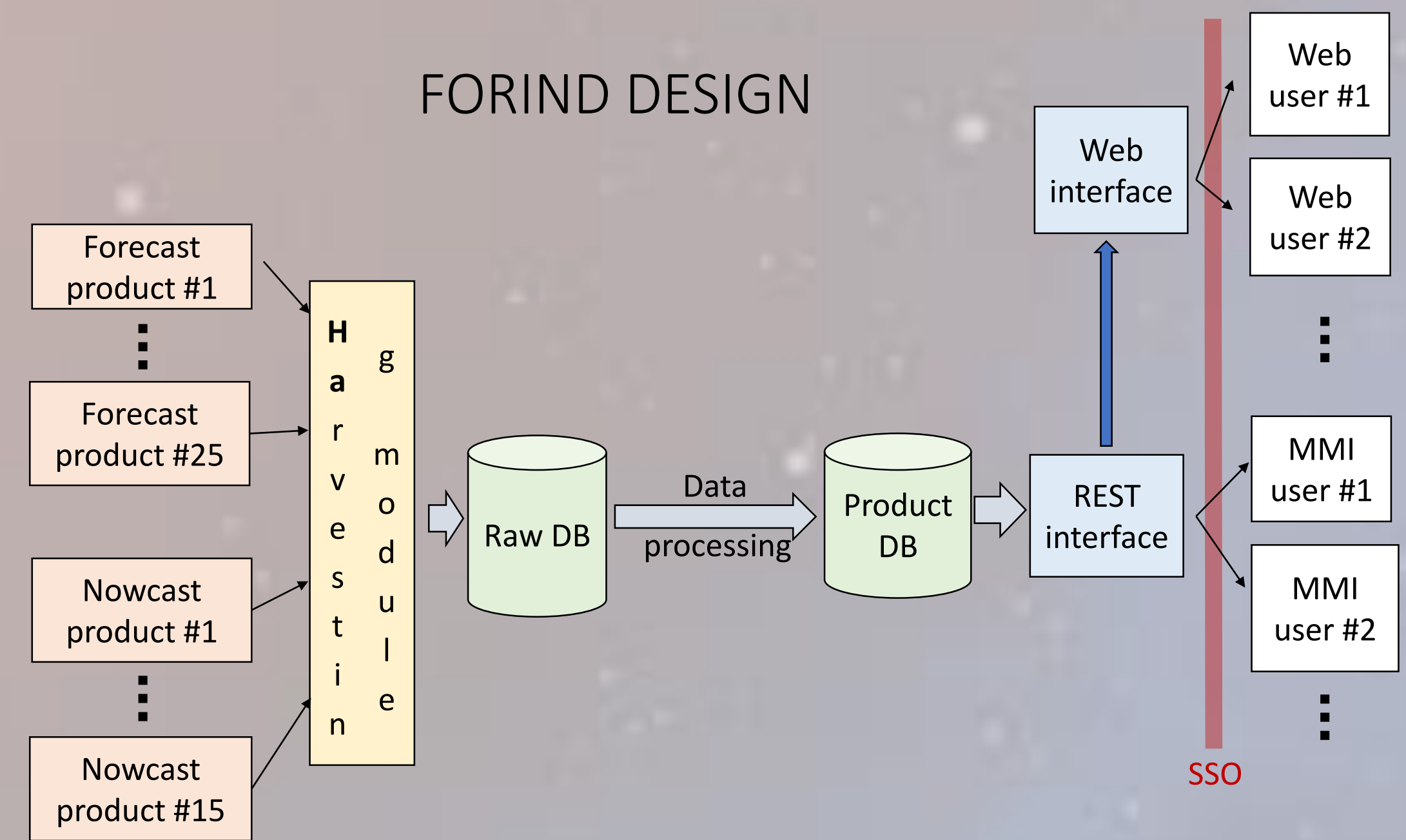
Service Developments" (P2-SWE-II). Its existing products and service elements are continuously being delivered, monitored and maintained (including provision of second line support) as part of SSA-P2-SWE-I.4 "Space Weather Expert Service Centres: Definition and Development" activities.

FORIND is available via the SSA SWE Portal (<http://swe.ssa.esa.int>) as part of the products provided by the Ionospheric Weather Expert Service Centre (I-ESC).

DESCRIPTION

- FORIND has been developed within the ESA SSA SWE activity on "Space Weather Service Developments" (P2-SWE-II). Its existing products and service elements are continuously being delivered, monitored and maintained (including provision of second line support) as part of SSA-P2-SWE-I.4 "Space Weather Expert Service Centres: Definition and Development" activities.
- FORIND is available via the SSA SWE Portal (<http://swe.ssa.esa.int>) as part of the products provided by the Ionospheric Weather Expert Service Centre (I-ESC). Direct link: <http://ssa.spacescience.ro/>
- We provide easy access to nowcasts and forecasts of 40 solar and geomagnetic indices, stored on a dedicated database and retrievable, in a custom tailored and homogeneous form, via a web page or a REST interface in CSV and JSON formats or visualized in PNG format.
- Some indices (30-day forecast of F30 index from CLS, 3-day ap index forecast from BGS and 27-day Ap index forecast by BGS) provided by our service (FORIND) are used by the atmospheric modelling service (ATMDEN) which is part of the same project and provided by Met Office UK: <http://sst-atm.spaceweatherservices.com/index.php>

FORIND DESIGN



FORIND integration into ESA SSA as part of I-ESC

FORIND service

Live product plots

Product category

Solar Geomag

Nowcast

Forecast

- F10.7 Index Forecast 27-day (BGS)
- F10.7 Index Forecast Predicted multi-year (SWPC)
- F10.7 Index Forecast Outlook 27-day (SWPC)
- F10.7 Index Forecast 45-day (SWPC)
- F30 Index Forecast Absolute 30-day (CLS)
- F30 Index Forecast Adjusted 30-day (CLS)
- Sunspot Number Forecast Standard Curve 12-month (SIDC)
- Sunspot Number Forecast Combined Method 12-month (SIDC)
- Sunspot Number Forecast Improved Standard Method 12-month (SIDC)
- Sunspot Number Forecast Improved Combined Method 12-month (SIDC)
- Sunspot Number Forecast Improved McMath & Lincoln method 12-month (SWPC)
- F10.7 Index Forecast Absolute 30-day (CLS)
- F10.7 Index Forecast Adjusted 30-day (CLS)

Specific product

Selection time interval:

Start: 2018-05-31 00:00 End: 2018-06-07 00:00 Last week

Format: JSON CSV PNG

Truncate

WEB interface – product selection

- In the REST architecture, each request from a client contains all the necessary information
- Suitable for machine to machine interface – automated data retrieval

Query example:

http://ssa.spacescience.ro/forecast.php?end_date=2018-06-07+21:00&output_type=PNG¶meter=aa_NMH_nowcast&start_date=2018-05-31+21:00

Required REST parameters:

- end_date**: end of the requested interval
- output_type**: desired format (CSV, JSON or PNG)
- parameter**: name of the desired parameter
- start_date**: start of the requested interval

REST interface

CSV output

PNG output

JSON output

References

ESA SSA portal: <http://swe.ssa.esa.int/>
 Space weather data service (FORIND): <http://ssa.spacescience.ro/>