

Making Coastal Altimetry Happen: A Prototype Envisat Processor from COASTALT



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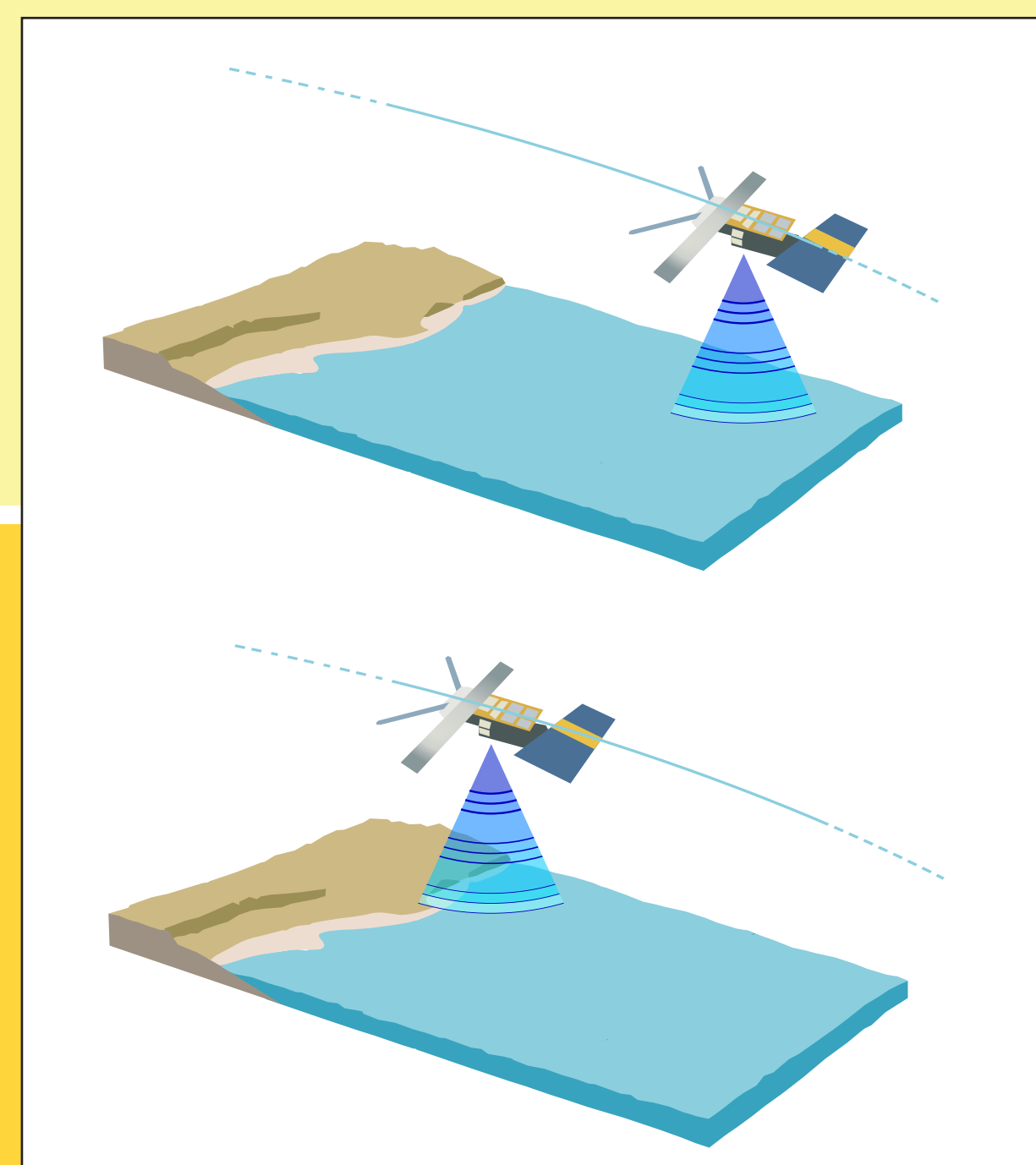
MOTIVATION

Satellite altimetry designed for open ocean BUT the coastal region has enormous socio-economic-strategic importance and **15 years of data over the coastal ocean are still unexploited** - normally flagged as 'bad' in the official products

These data can - and should - be recovered!

Many possible uses, including:

- Sea level, currents, wave - not only long term studies & climatologies, but also specific events
- Assimilation into coastal models
- Rapid Environmental Assessment



COASTALT in a nutshell

Six Work Packages:

- 1) user requirements for a pulse-limited radar altimetry product
- 2) improvement of corrections
- 3) development of ad-hoc retracking model **and processor prototyping**
- 4) specification of Level 2 output coastal product format and contents, and a product user handbook,
- 5) validation and performance assessment of the new products
- 6) outreach & dissemination

FRAMEWORK

ESA is now funding a 2-year research and development study, **COASTALT**, led by NOCS; this is done in coordination with CNES which is funding a parallel study in France, named **PISTACH** and led by CLS

COASTALT aims to lead to the definition, specification and prototyping of a new pulse-limited radar altimetry coastal zone product for Envisat

In COASTALT this is done over a number of study regions:

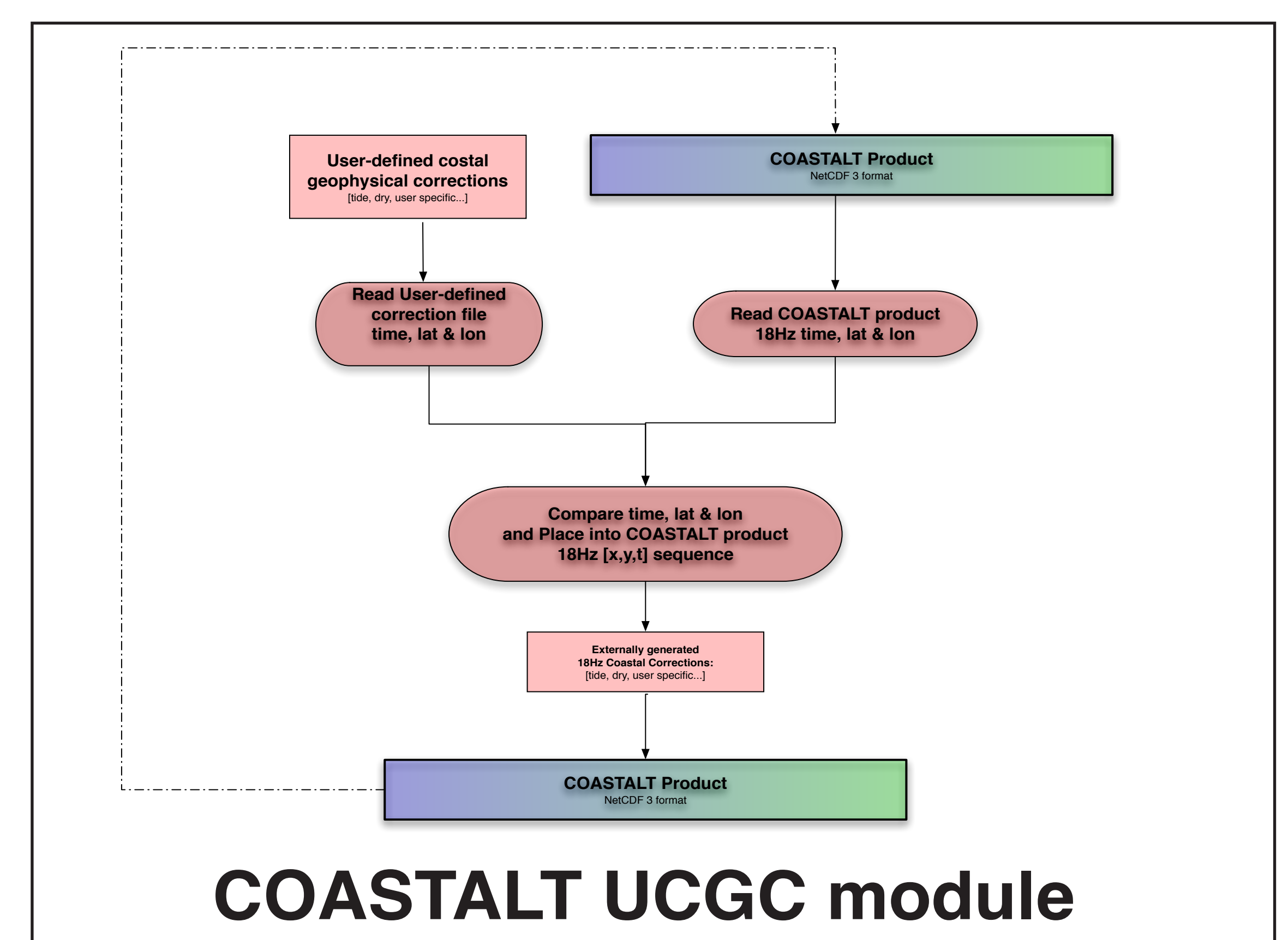
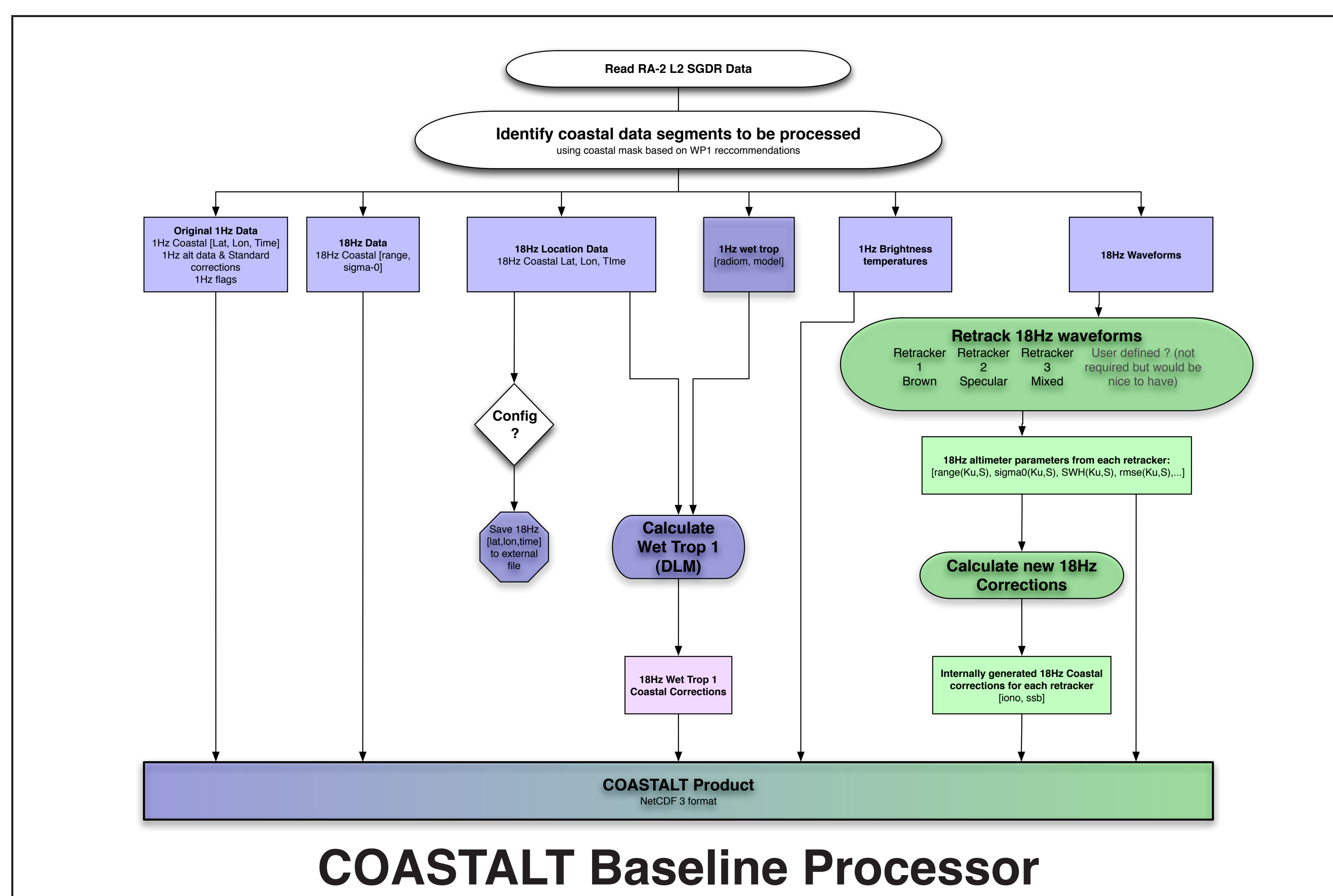
- NW Mediterranean (incl Corsica Channel)
- West Britain
- Portugal Coast

The new product is eventually to become operationally processed by ESA, including the reprocessing of all the ESA Radar Altimetry archive (ERS-1, ERS-2, ENVISAT) and the exploitation of CryoSat and Sentinel-3 over the coastal zone. PISTACH focuses on NASA/ CNES Jason-1, Jason-2 instead.

The basic idea of the COASTALT processor is to have a **Baseline Processor** capable of generating a product everywhere, plus an additional **User-defined Coastal Geophysical Corrections (UCGC) module** that can add any custom correction of choice. **This two-module design ensures both robustness and flexibility**

The **COASTALT Baseline processor** includes:

- the main interface to the SGDR data input files (containing GDR 1Hz and 18Hz data and flags, and 18Hz waveforms, Ku-band and S-band).
- the application of the coastal mask, which identifies those data segments in the SGDR file that require coastal processing (a custom user-specified coastal mask can be used if needed)
- an option to export to text file of GDR Level 2 latitude, longitude and time at 18Hz
- the retracking of Ku-band and S-band waveforms simultaneously with three retracker models
- the computation of baseline coastal geophysical corrections derived from data in the SGDR product and new output from the coastal retrackers
- the production of the COASTALT output product (NetCDF)



The UCGC module is an optional stand-alone add-on, which allows users to append additional corrections to the COASTALT NetCDF output product. This module requires one user-defined file containing the desired geophysical correction. The module can be run several times, each iteration simply adding one more variable to the COASTALT NetCDF output product.

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www.coastalt.eu