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Supplementary Information

Evaluation of a Global Soil Moisture Product from Finer Spatial Resolution SAR Data and Ground Measurements at Irish Sites. *Remote Sensing* 2014, *6*, 8190–8219

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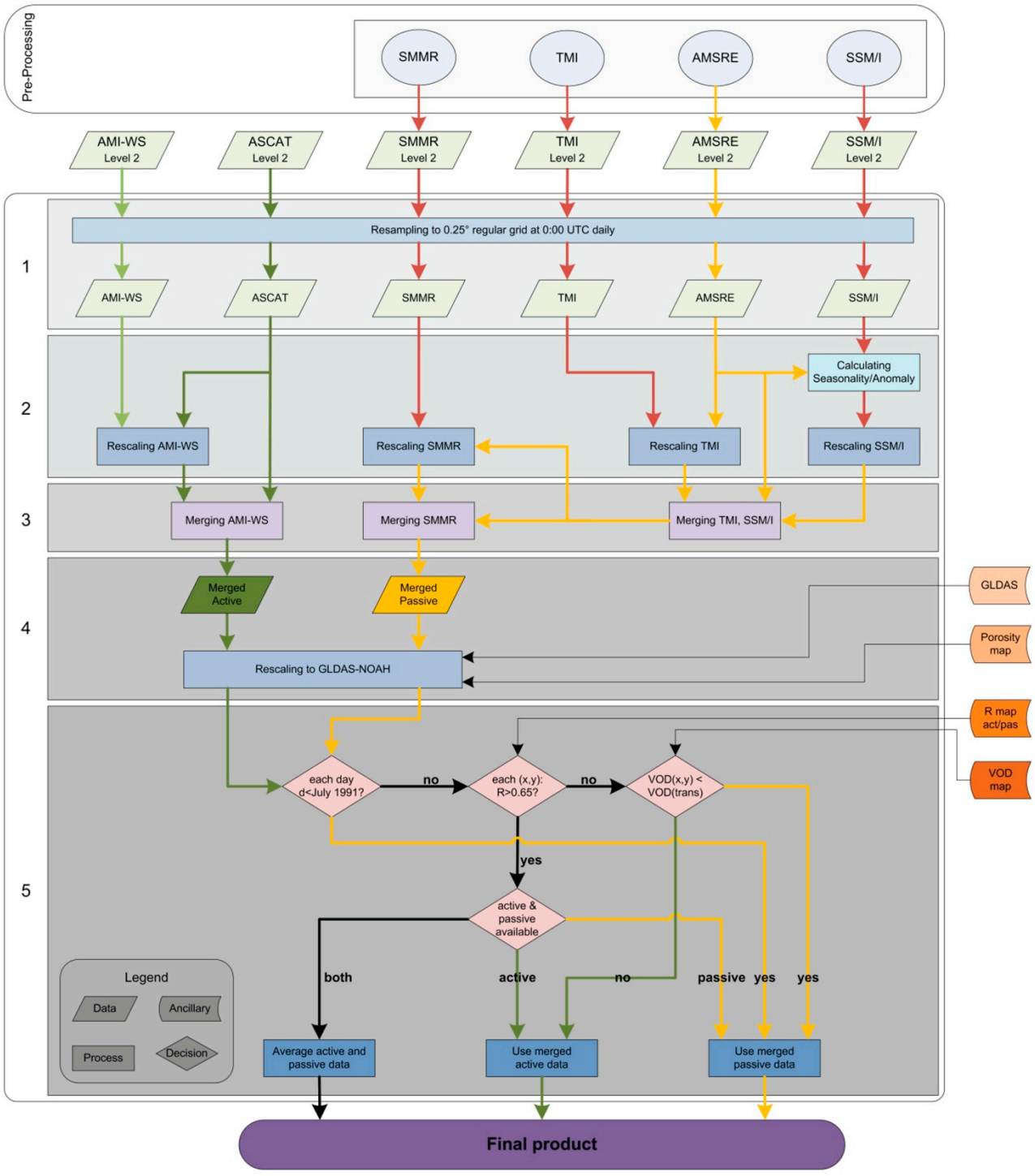
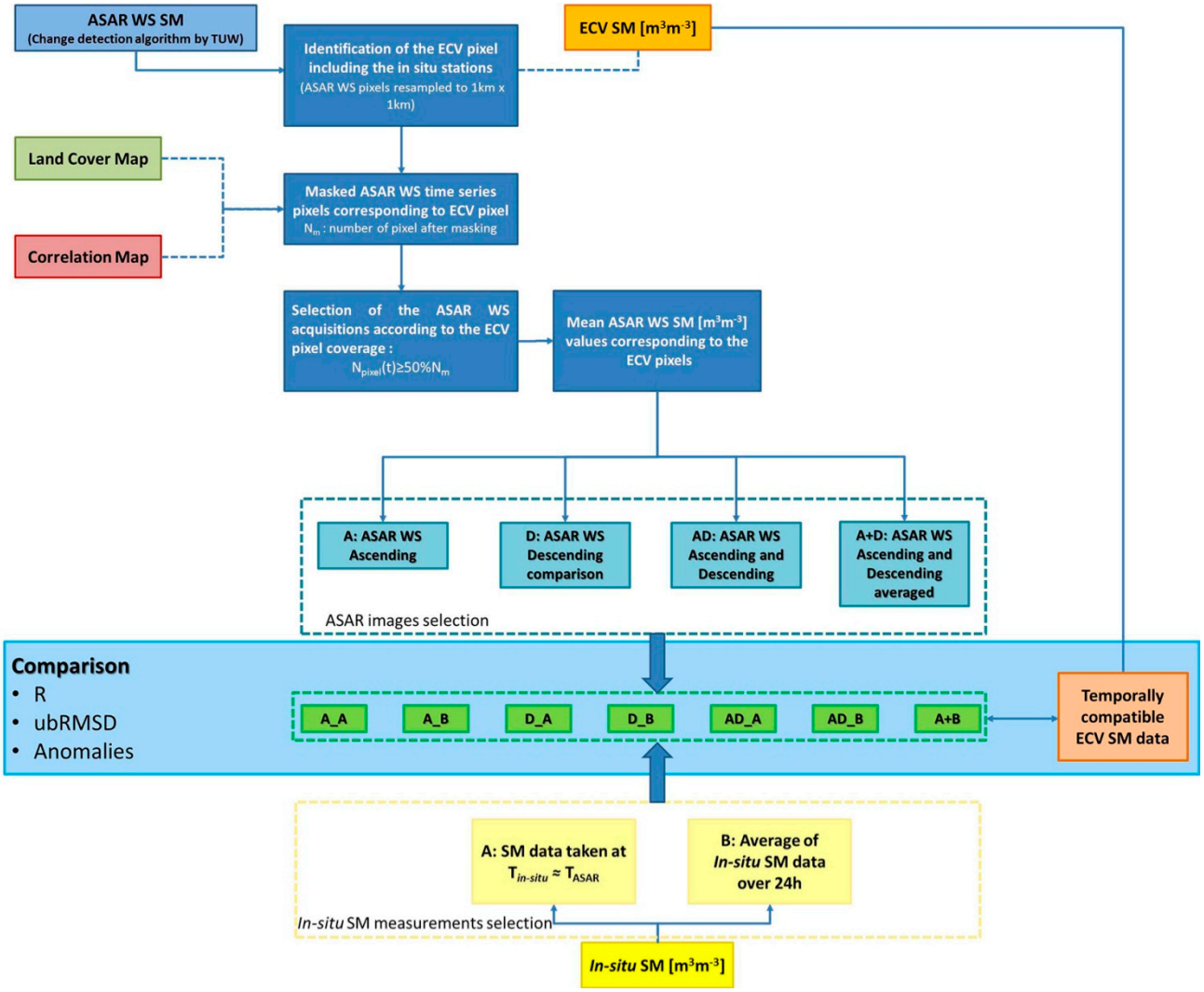
This supplementary supports the main text as follows:

Figure S1. ECV SM product generation.



Note: Flow chart describing the process used to generate the global ECC SM product by using active and passive microwave sensors. Credit: Wolfgang Wagner, TUW. For a detailed explanation please refer to the published paper and to the cited works.

Figure S2. Regional based comparison of ASAR WS, ECV and *in-situ* soil moisture time series.



Note: Flow chart describing the pre-processing and the approaches adopted for the regional based analysis of soil moisture products.

Soil moisture data have been retrieved from ASAR WS acquisitions by applying the change detection algorithm developed at TUW. ASAR images taken over the areas corresponding to the ECV product cells including the *in-situ* stations have been collected. After a masking process by using ancillary information (land cover map and correlation map), only ASAR images covering more than 50% of the available pixels within the ECV cell have been taken into account for the study. In each ECV pixel, the average of ASAR soil moisture has been evaluated.

The comparison between ASAR, ECV and *in-situ* soil moisture datasets has been carried out in terms of correlation (R) and unbiased RMSD (ubRMSD). The SM anomalies have been also evaluated by considering the whole period of observation, from 2007 to 2009. Similar analysis has been performed also on a seasonal basis.

Seven approaches have been tested by comparing different sets of ASAR and *in-situ* data. Firstly, ascending and descending ASAR acquisitions have been used separately. Then both of them have been included in the ASAR SM dataset. Finally, when ascending and descending SM data were available in

the same day, the average of soil moisture has been evaluated. These different ASAR SM datasets have been compared with the ECV SM product and with *in-situ* measurements. Two approaches have been tested to select the *in-situ* SM data. In the first approach only *in-situ* measurements taken at the time closest to the ASAR acquisitions have been used. In the second test the daily average of soil moisture *in-situ* has been calculated.

For a more detailed explanation please refer to the published paper.