

This paper proposes using surface current maps derived from High Frequency Radars (HFR) to define a Coastal Upwelling Index (CUI), a quantity that is usually obtained from other met-ocean parameters such as wind speed, sea level pressure field or Sea Surface Temperature (SST). The advantage of the HFR-derived CUI (CUI-HFR) over classical indices is the ability to provide spatial maps (instead of mere time series) and to account for the ocean circulation which cannot be apprehended by the other parameters. To assess the relevance of this new index, the data originating from 2 networks of HFR in the North-West Iberian Peninsula are processed and compared with the traditional wind-derived CUI (CUI-WIND) as well as with a CUI defined from a global operational 3D ocean model (CUI-GLOBAL). In addition, some satellite measurements of SST and Chlorophyll are used to corroborate the upwelling/downwelling events.

The paper is interesting, well written and well documented. It introduces a promising and important new application of HFR. For these reasons I think it deserves acceptance for publication. I have only a list of minor remarks and questions, whose clarification could help consolidating the methodology and results. I list them below in order of appearance in the text.

1) Section 4 p 7 : ocean-based CUI and wind-based CUI are found strongly correlated. Does this merely mirrors the correlation between winds and surface currents or is there a deeper reason ? What would be the correlation coefficient between the components of wind and current velocities (u-wind versus u-current and v-wind versus v-current) ?

2) I see no statistical comparison (correlation coefficient, RMS difference) to compare CUI-GLOBAL and CUI-HFR. This would be interesting to see how close they in order to coarsely quantify the accuracy that can be expected from these two types of estimators.

3) What is the influence of tidal currents on the hourly CUI-HFR ? As the CUI-GLOBAL is free of tide, I suppose this induces an extra difference ?

4) p 8 line 228 : The « overall concordance » between HFR-CUI and GLOBAL-CUI seems somewhat euphemistic when looking at Figure 3. There are some important differences both in magnitude and direction of the currents. Is there any clue as to which data (HFR or model) is more reliable ?

5) For the upwelling event #2 (Figure 3 c), the HFR data around latitude 41.4 N show a localized drop of intensity of the CUI-HFR which is not consistent with the model (Figure 3d) The same phenomenon is visible for the upwelling event #1 although less pronounced (Figure 3a). At first sight this could be interpreted as a systematic error of the HFR measurement in this area. On the other hand, the Chlorophyll map on Figure 1a) shows the same disconnected structures around the same latitude, supporting the HFR pattern. Could you comment on this qualitative difference between HFR and GLOBAL in this case ? What can be said on the reliability of HFR measurement around this small area ?

6) p 9 line 280 : « with » respect to