



Combining classification and time series modeling for improved water level prediction.

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Obtaining accurate water level estimates is one of the primary goals when processing altimetry data. This can, however, be challenging over inland water due to land contamination in the received signal, which may result in noisy and potentially erroneous water level estimates. The shape of the waveform contains information regarding the quality and in some degree also the surface type of the received signal. Hence, by considering various features of the waveform we can classify the waveforms according to their shape. The waveform class information is not used as a criterium for discarding problematic data but simply used as an additional information when predicting the water level with a robust state-space model. In the model, we estimate a different data variance for each class. Hence, we expect that water levels obtained from complex waveform classes will tend to have a higher variance compared to classes with more simple water returns. The additional data variance information is expected to aid the construction of the final time series.

Her we investigate the effect of a class defined data variance in the construction of time series for inland water. We use Cryosat-2 data to estimate water levels for selected lakes and compare with in-situ data when possible.