# WIND FIELD PARAMETERS CALCULATED FROM OPERATIONAL MODEL HIRLAM AND BaltAn65+ FIELDS

**Rivo Uiboupin, Marine Systems Institute at Tallinn University of Technology**
**Germo Väli, Marine Systems Institute at Tallinn University of Technology**
**Laura Raag, Marine Systems Institute at Tallinn University of Technology**

Wind field parameters covering years 1965-2010 were calculated using data from two different model fields.

- First source of data was operational model data from High Resolution Limited Area Model (HIRLAM) from years 2006-2010. The HIRLAM data has temporal resolution of 3 h.
- Second source of data was regional reanalysis database BaltAn65+ comprising meteorological data for Baltic Sea region for the time period 1965–2005. The BaltAn65+ dataset has spatial resolution of 11 km and temporal resolution of 6 h.

Two time frames were selected for mapping of wind parameters - (i) 1965-2010 and (ii) 2001-2010. For the given time frames the following parameters at 10 m height were calculated: mean monthly wind speed, mean annual wind speed, mean monthly energy density, Weibull scale parameter A and Weibull shape parameter k (Figures 1-16).

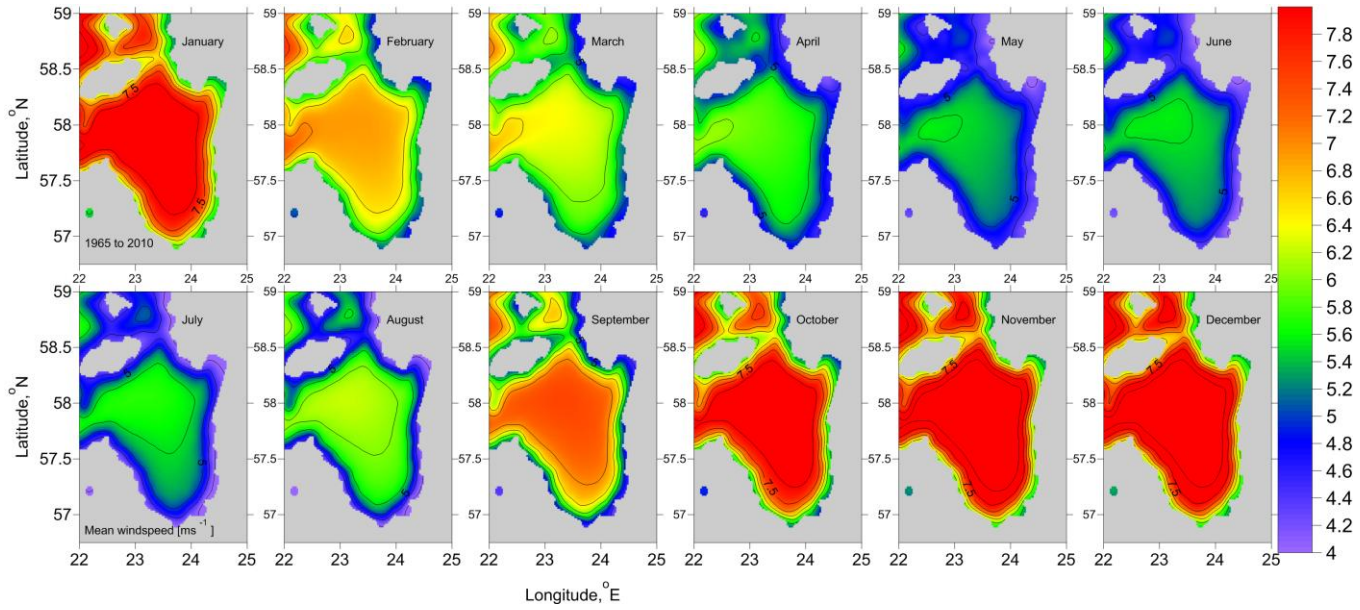


Figure 1. Mean monthly wind speed (m/s) at 10 m during years 1965-2010 calculated from HIRLAM and BaltAn65+ fields.

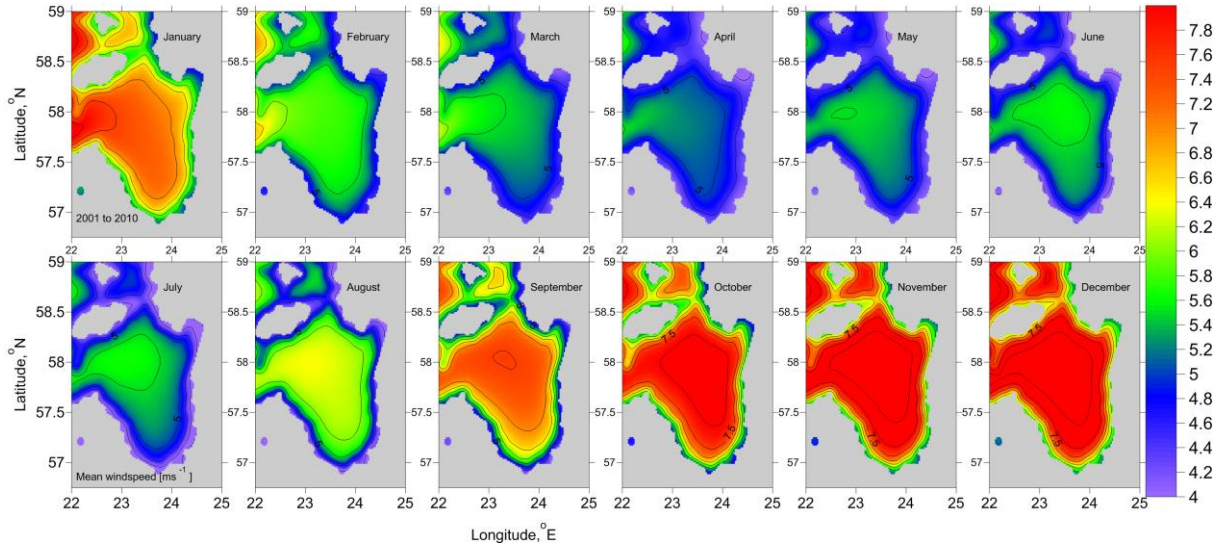


Figure 2. Mean monthly wind speed (m/s) at 10 m during years 2001-2010 calculated from HIRLAM and BaltAn65+ fields.

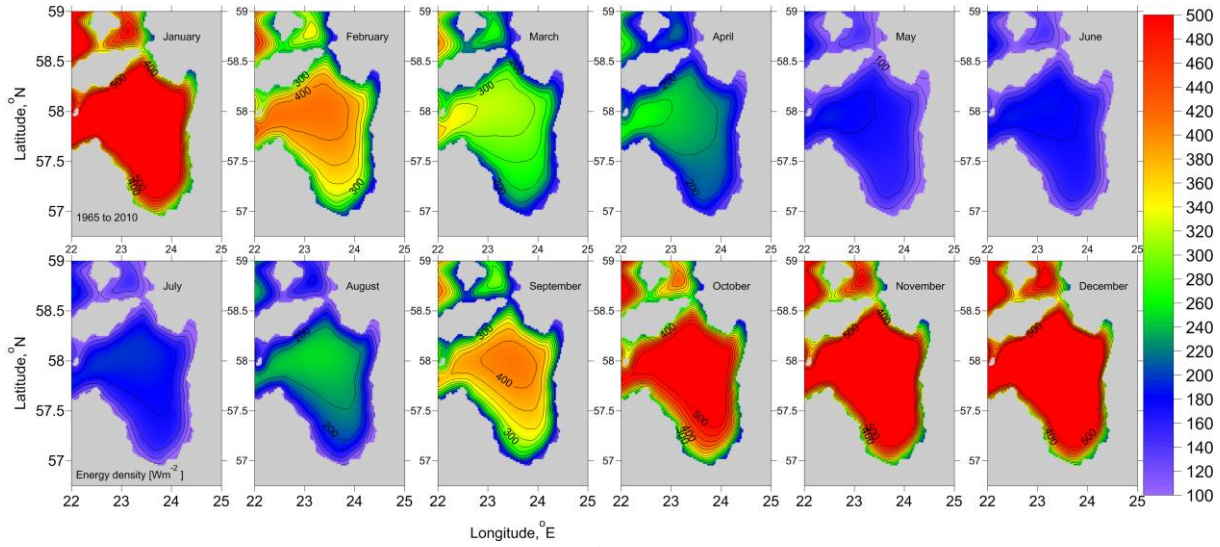


Figure 3. Mean monthly energy density ($W/m^2$) at 10 m above ground level during years 1965-2010 calculated from HIRLAM and BaltAn65+ fields.

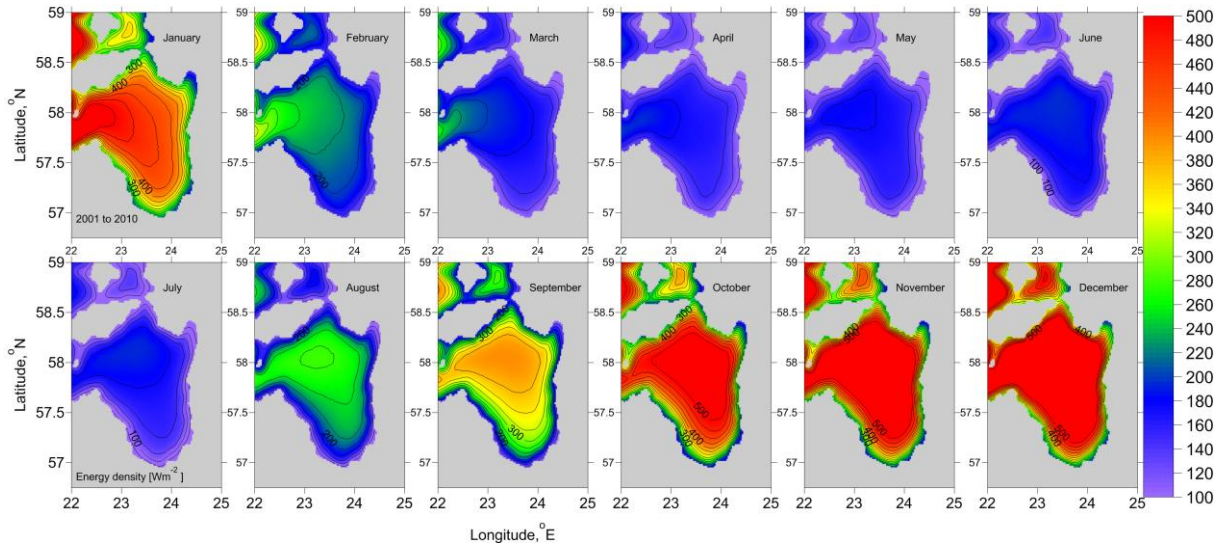


Figure 4. Mean monthly energy density (W/m$^2$) at 10 m above ground level during years 2001-2010 calculated from HIRLAM and BaltAn65+ fields.

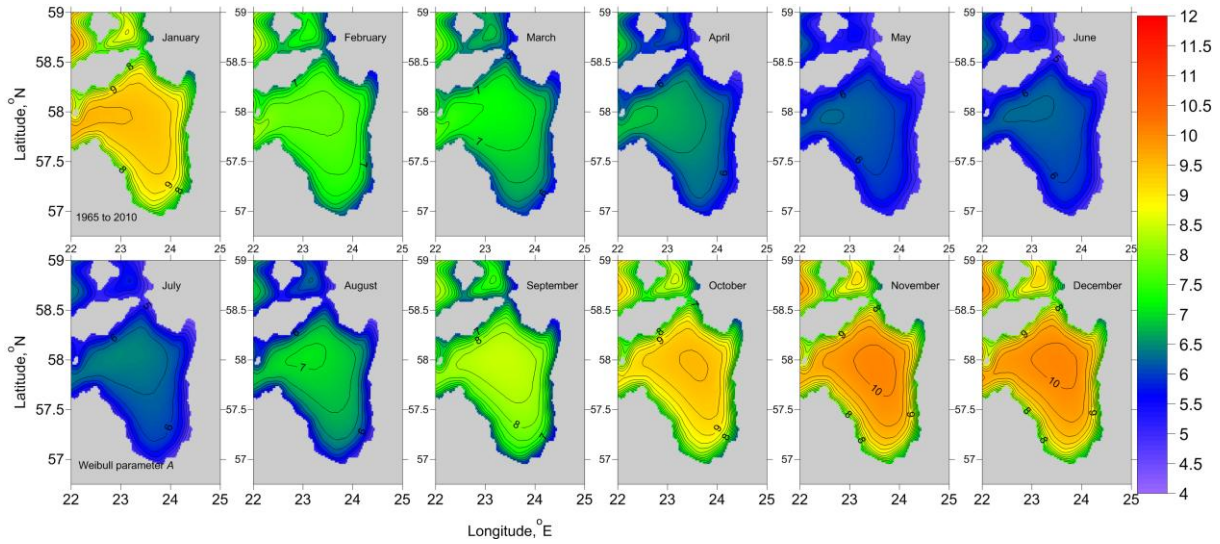


Figure 5. Mean monthly Weibull scale parameter A (m/s) at 10 m above ground level during years 1965-2010 calculated from HIRLAM and BaltAn65+ fields.

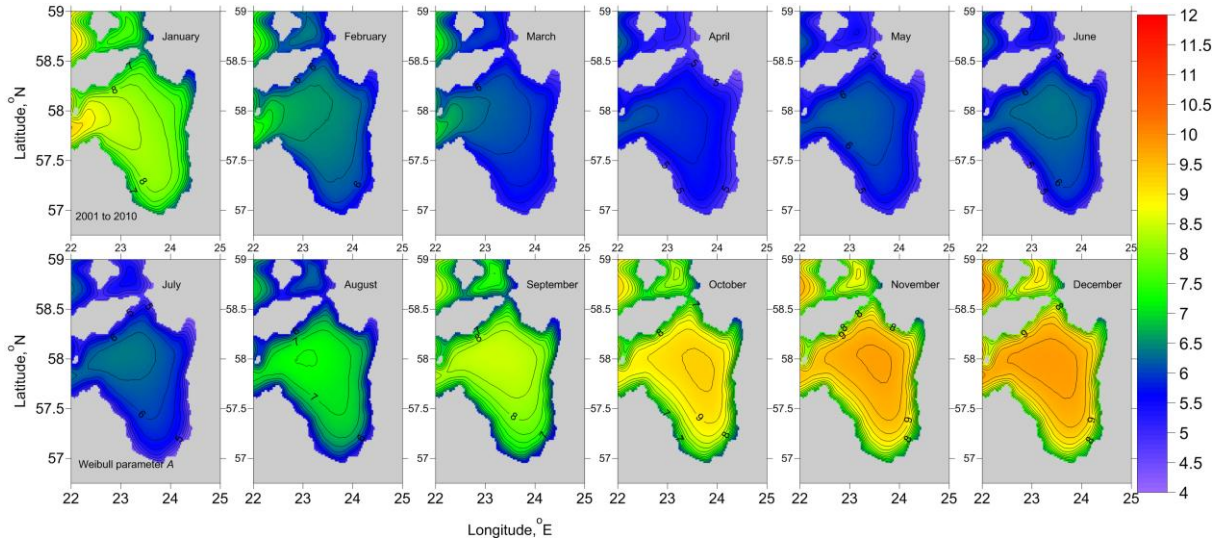


Figure 6. Mean monthly Weibull scale parameter A (m/s) at 10 m above ground level during years 2001- 2010 calculated from HIRLAM and BaltAn65+ fields.

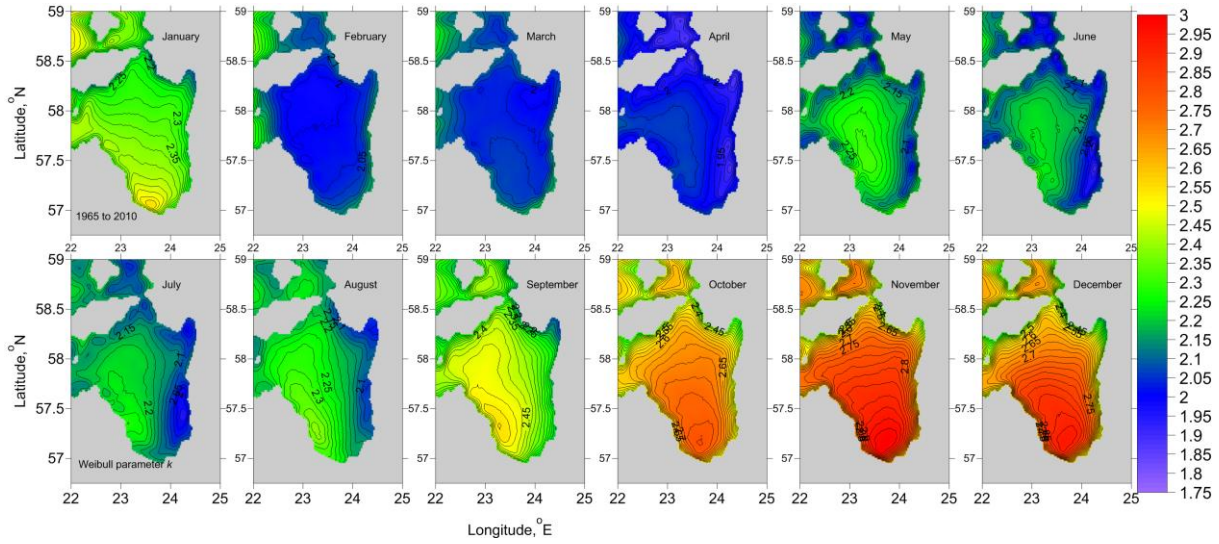


Figure 7. Mean monthly Weibull shape parameter k at 10 m above ground level during years 1965-2010 calculated from HIRLAM and BaltAn65+ fields.

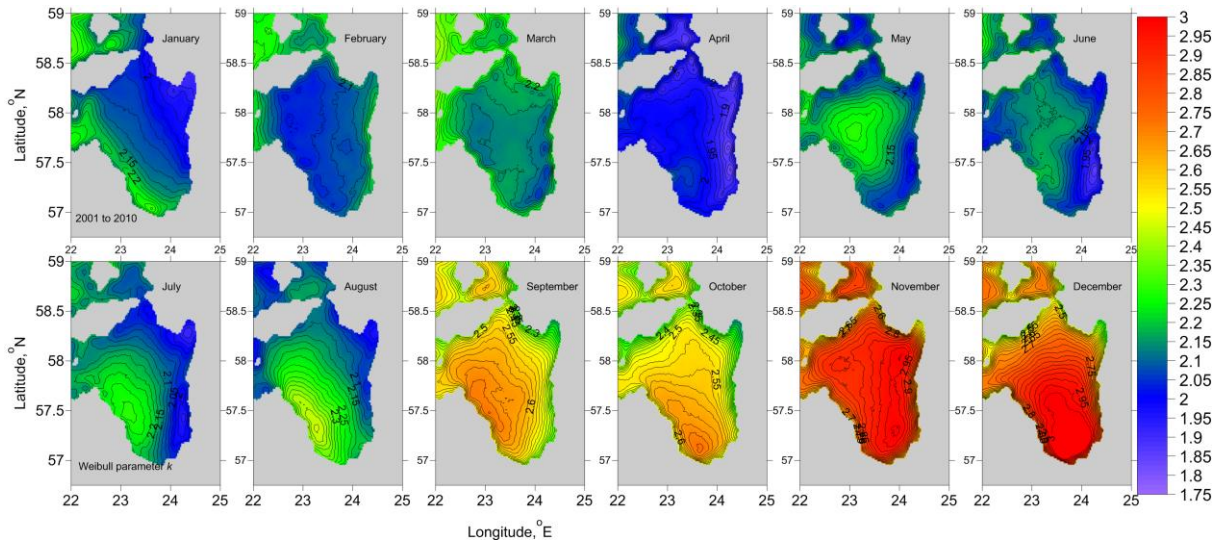


Figure 8. Mean monthly Weibull shape parameter k at 10 m above ground level during years 2001-2010 calculated from HIRLAM and BaltAn65+ fields.

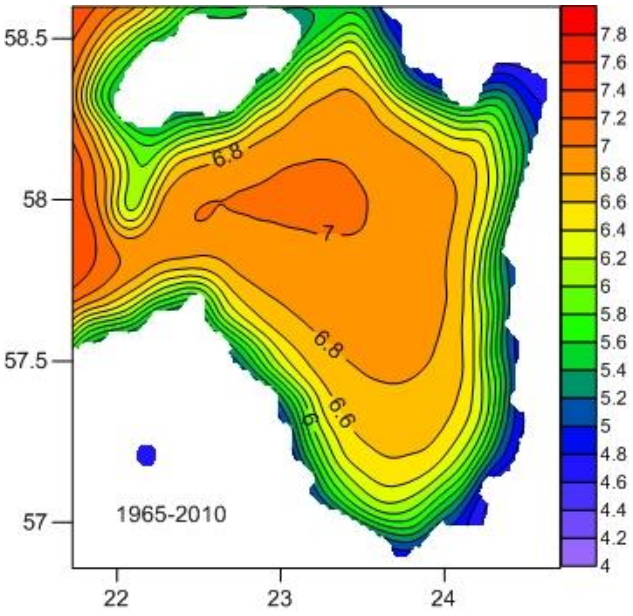


Figure 9. Mean annual wind speed (m/s) for the period 1965-2010 calculated from HIRLAM and BaltAn65+ fields.

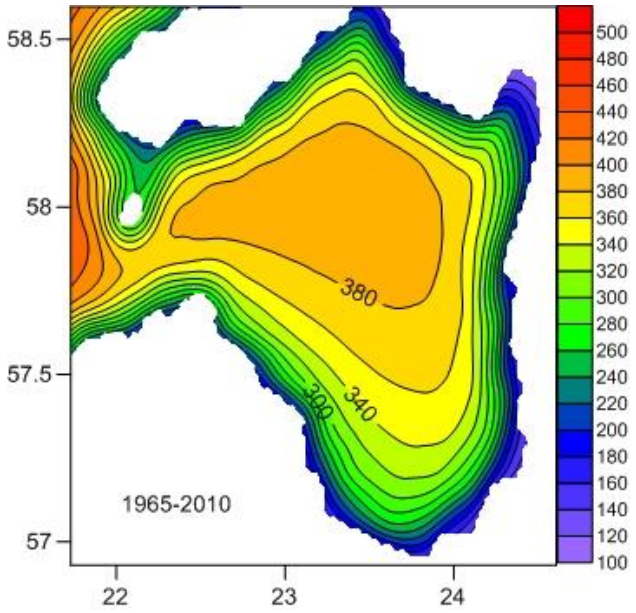


Figure 10. Mean annual energy density (W/m$^2$) for the period 1965-2010 calculated from HIRLAM and BaltAn65+ fields.

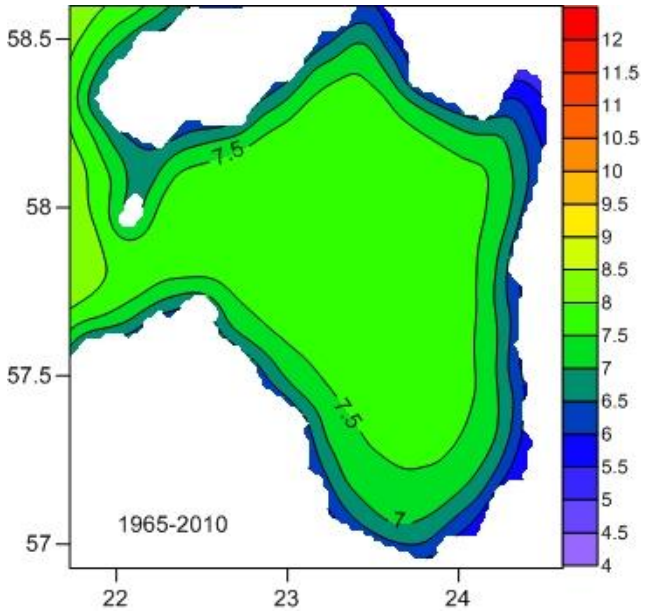


Figure 11. Mean annual Weibull scale parameter A (m/s) for the period 1965-2010 calculated from HIRLAM and BaltAn65+ fields.

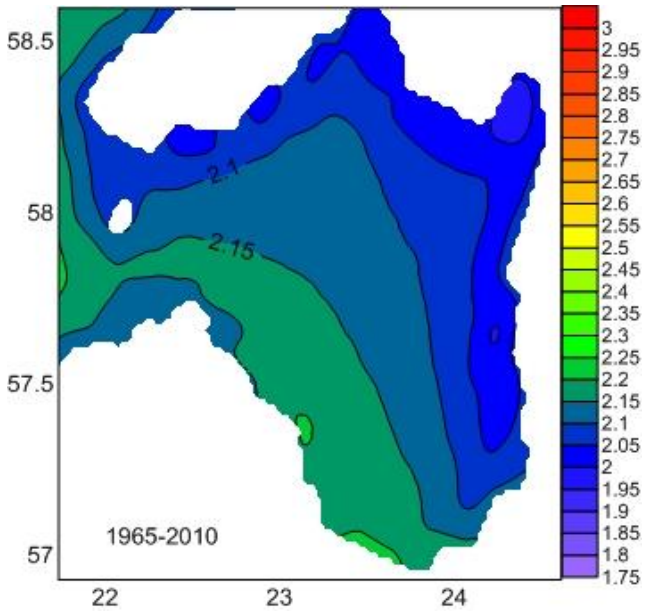


Figure 12. Mean annual Weibull shape parameter k for the period 1965-2010 calculated from HIRLAM and BaltAn65+ fields.

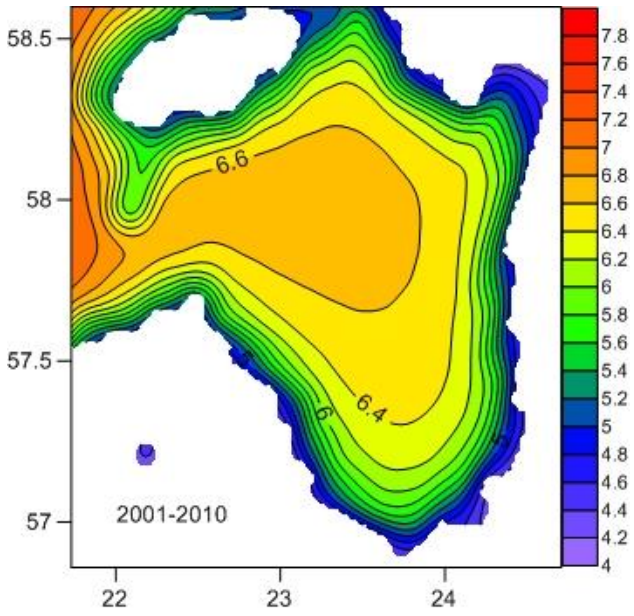


Figure 13. Mean annual wind speed (m/s) for the period 2001-2010 calculated from HIRLAM and BaltAn65+ fields.

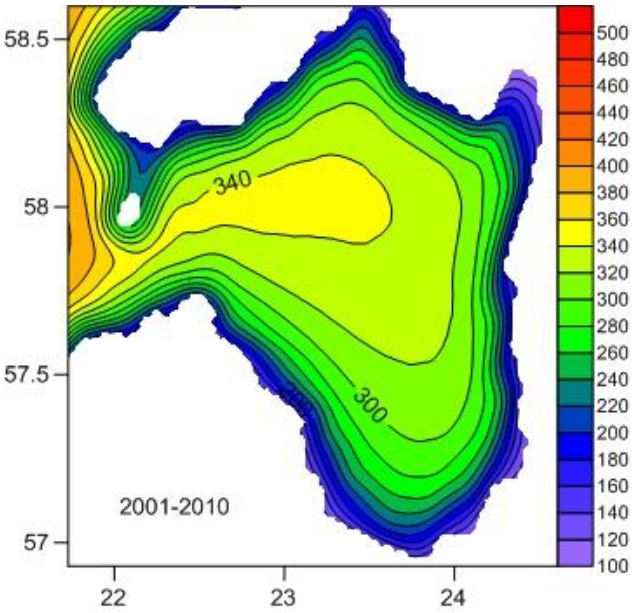

Figure 14. Mean annual energy density (W/m$^2$) for the period 2001-2010 calculated from HIRLAM and BaltAn65+ fields.

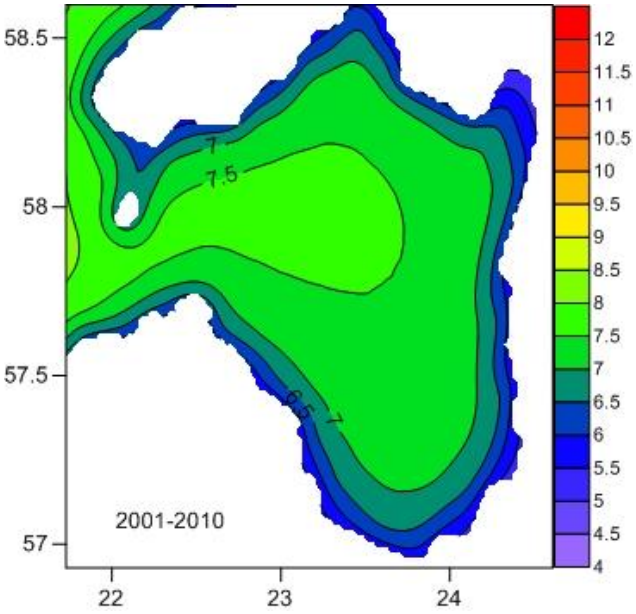

Figure 15. Mean annual Weibull scale parameter A (m/s) for the period 2001-2010 calculated from HIRLAM and BaltAn65+ fields.

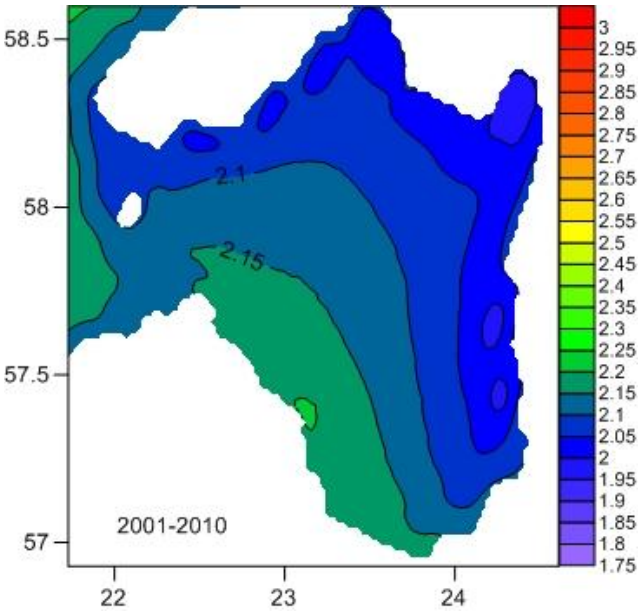

Figure 16. Mean annual Weibull shape parameter k for the period 2001-2010 calculated from HIRLAM and BaltAn65+ fields.