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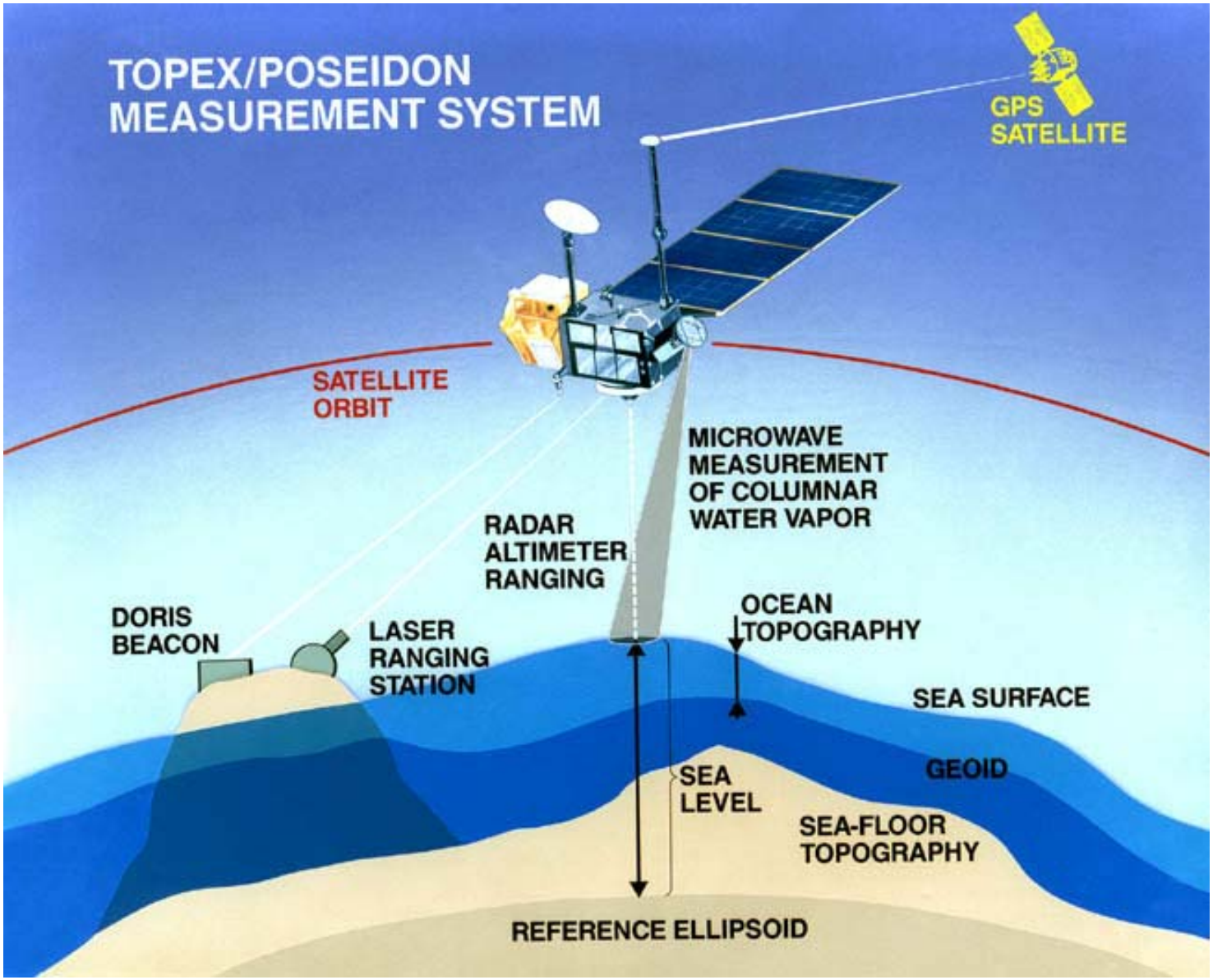
Seasonal variations of Okhotsk Sea circulation from Topex/Poseidon satellite altimetry data



10-yars (1993-2002) Topex\Poseidon data were used to investigate seasonal changes of sea level and geostrophic currents

$H_Y = H_C-(H_A+C_{WT}+C_{DT}+C_I+C_{EMB}) – H_{IB}$,

H_Y - a sea level, H_C - height of an orbit of the satellite,

H_A - altimetry range, C_{WT} - wet troposphere correction,

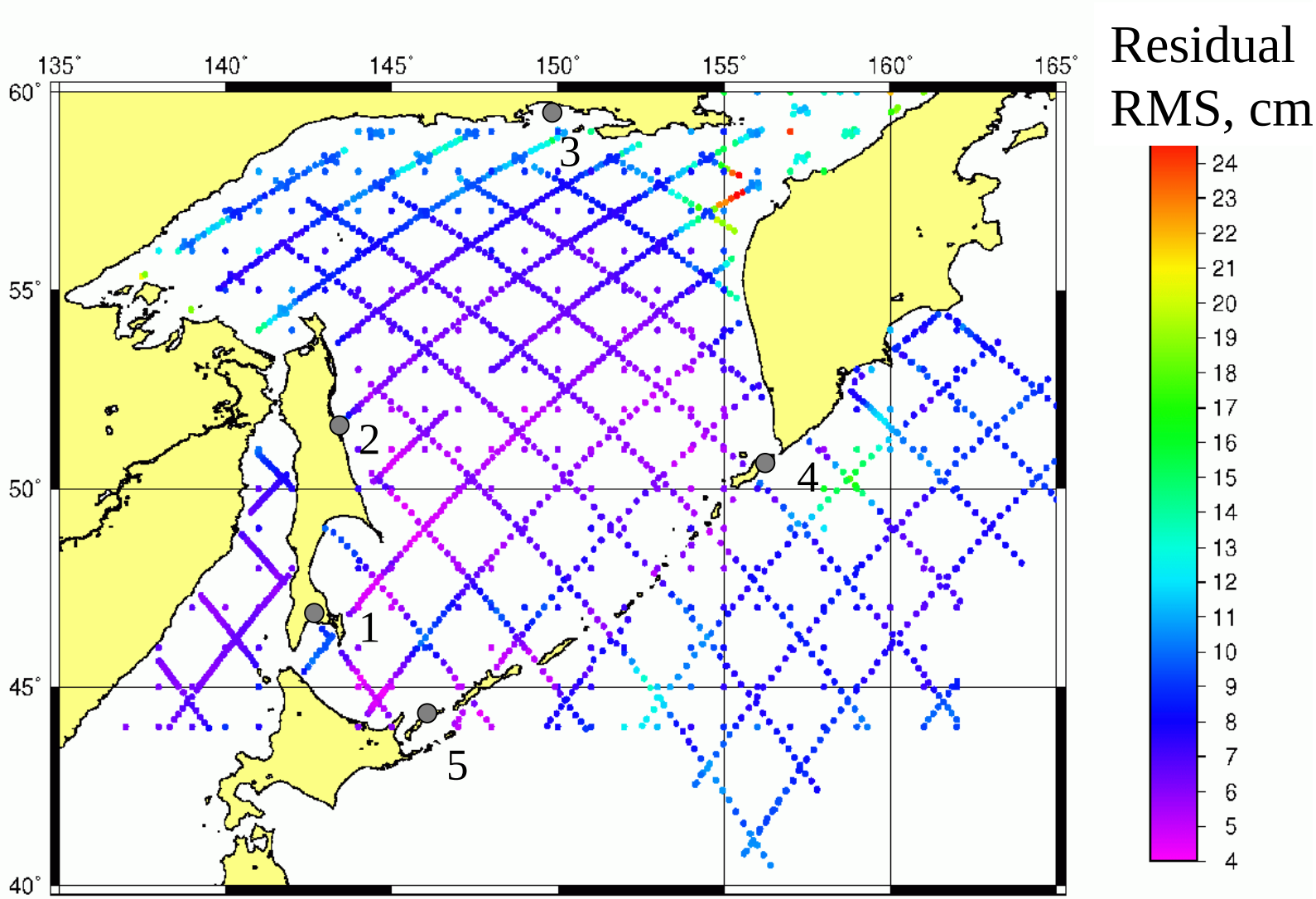
C_{DT} - dry troposphere correction,

C_I - ionosphere correction,

C_{EMB} - electromagnetic bias correction,

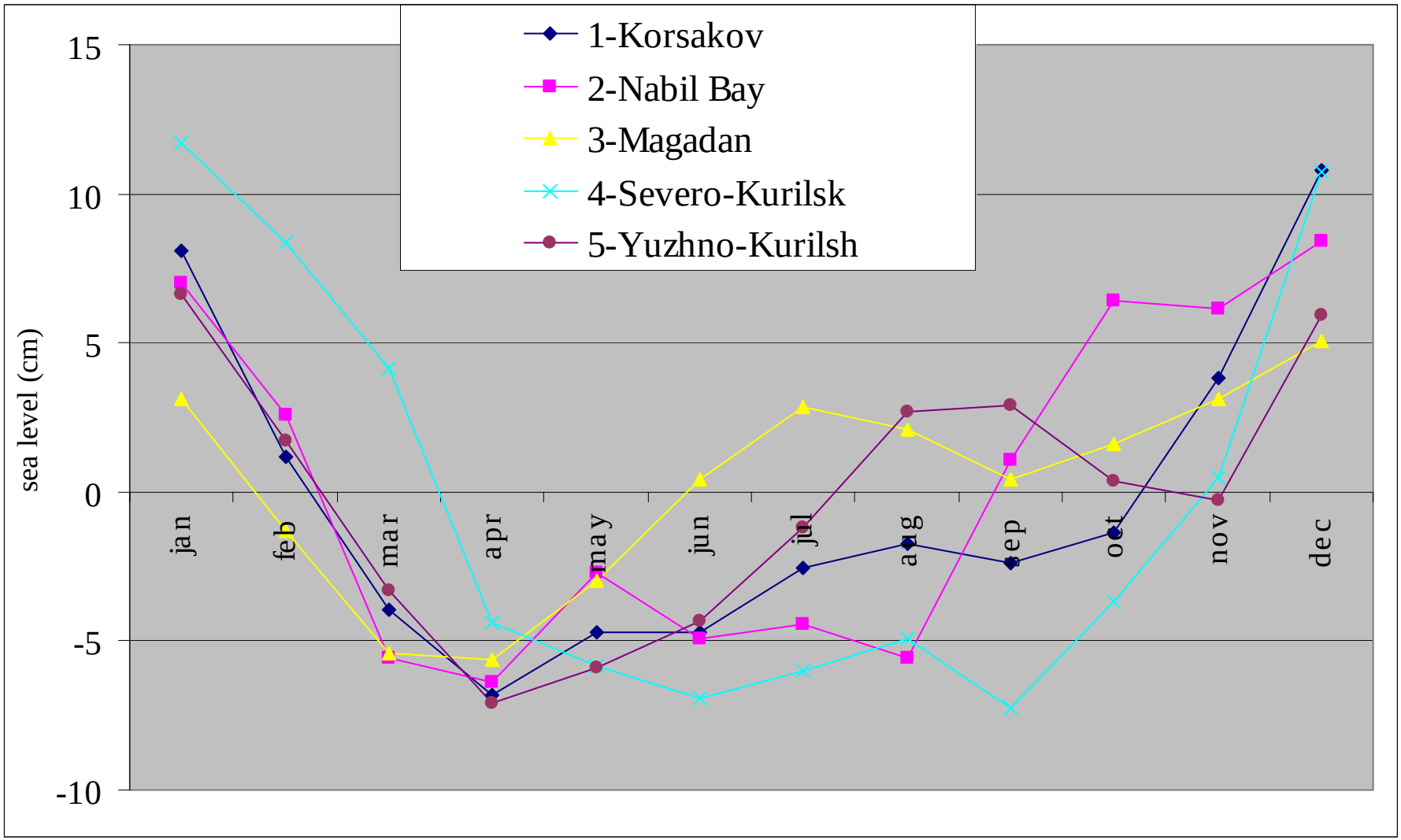
H_{IB} - inverse barometer correction.

We make special modification of LSM algorithm for tidal analysis in each spot singly because GOT Model is not enough precise for the Sea of Okhotsk

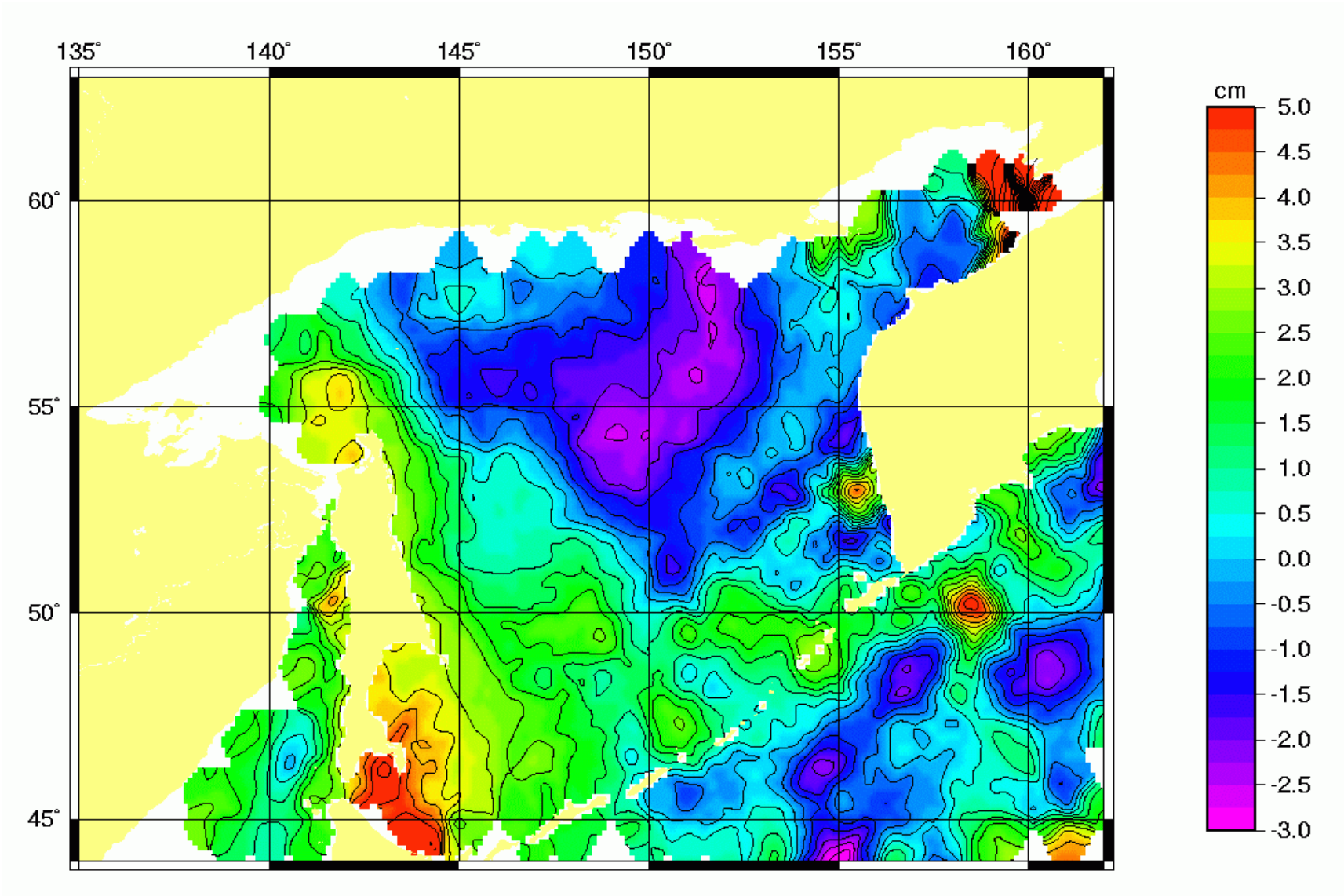


The map of spots along the sub-satellite TP tracks. RMS of residual series (18 tidal waves were predicted and subtracted) are marked by different colors.

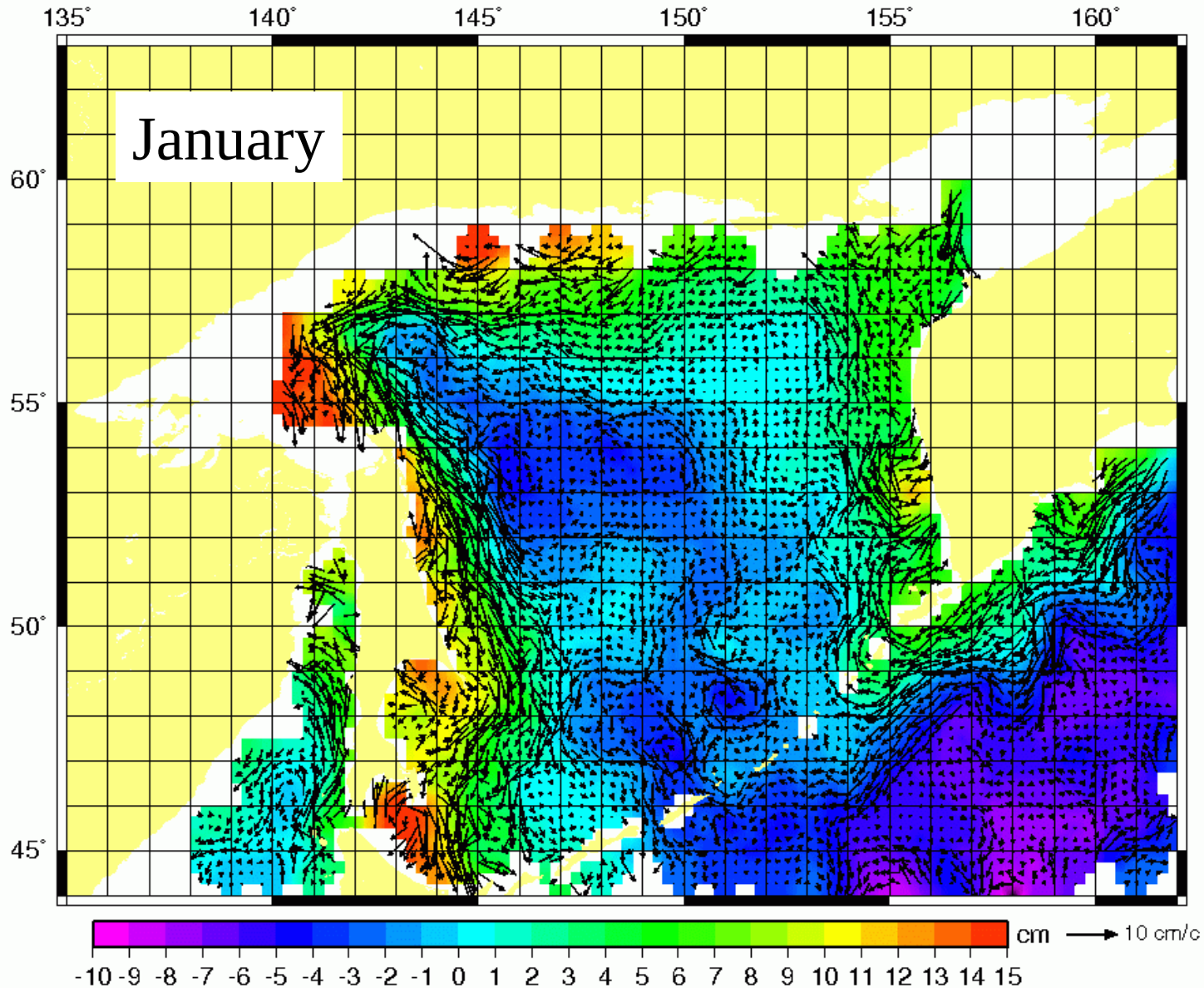
Monthly mean sea levels at the different tide gauges of Okhotsk Sea



The map of multiyear mean sea level (total)



Multiyear mean sea levels and geostrophic currents



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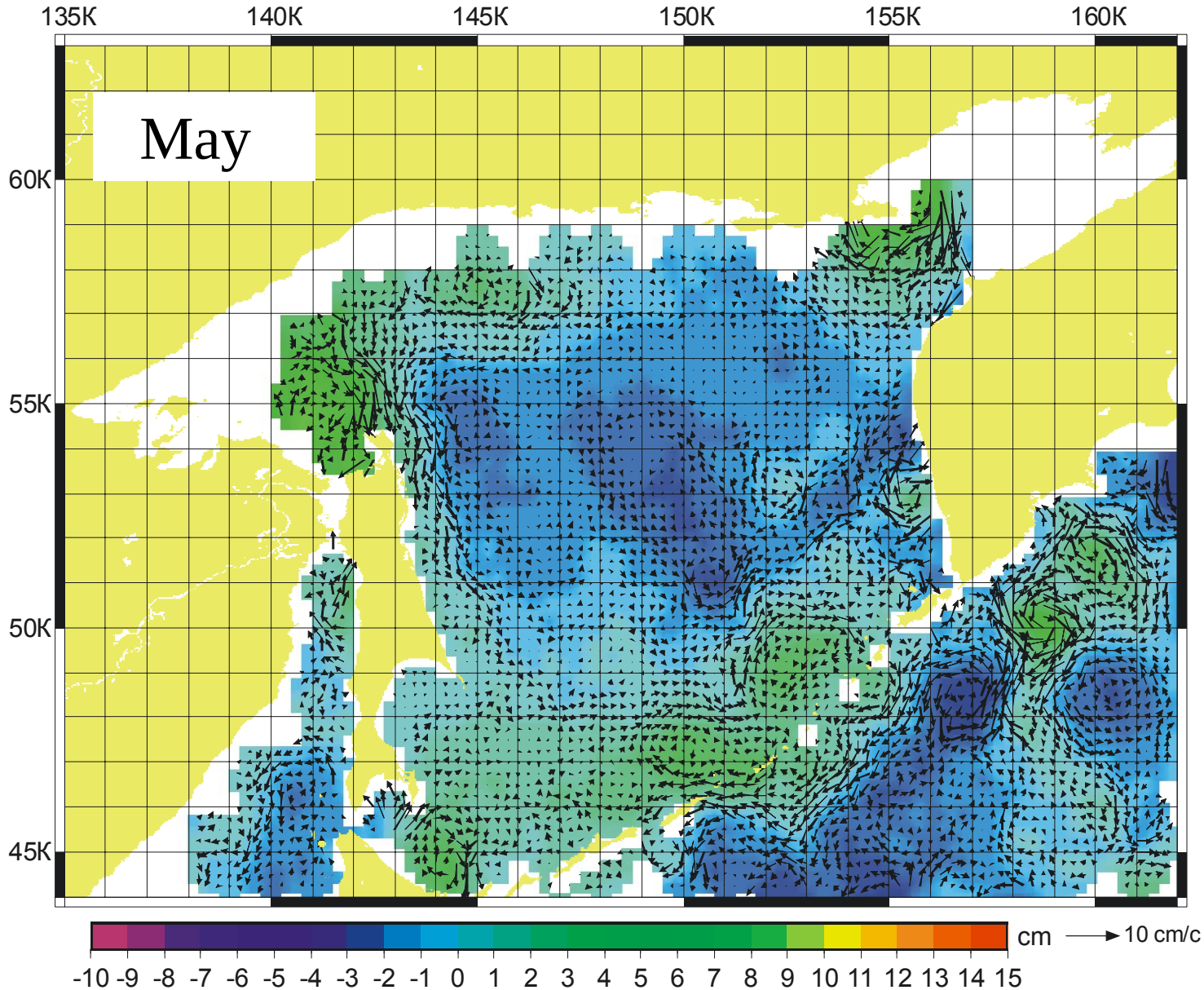

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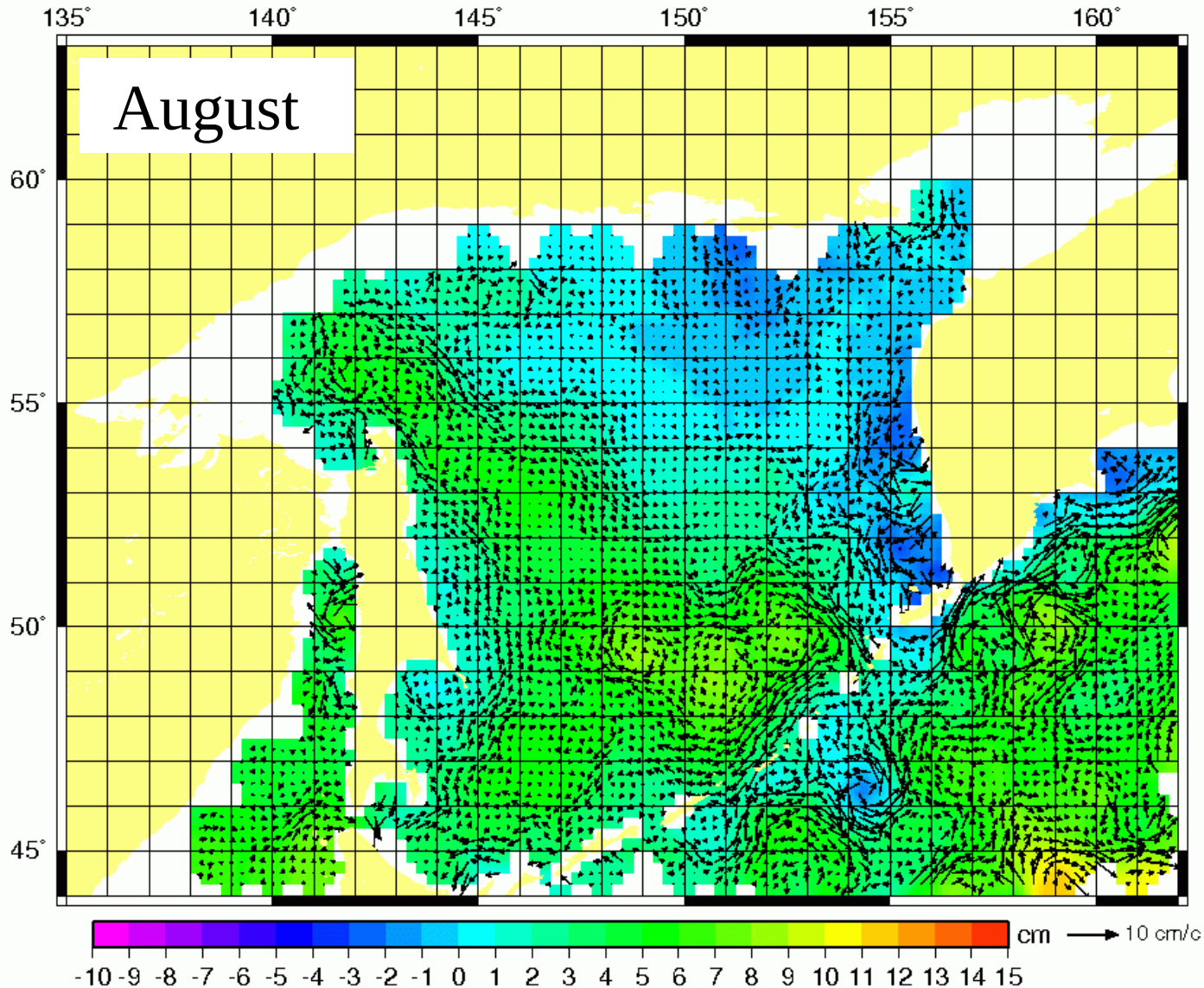
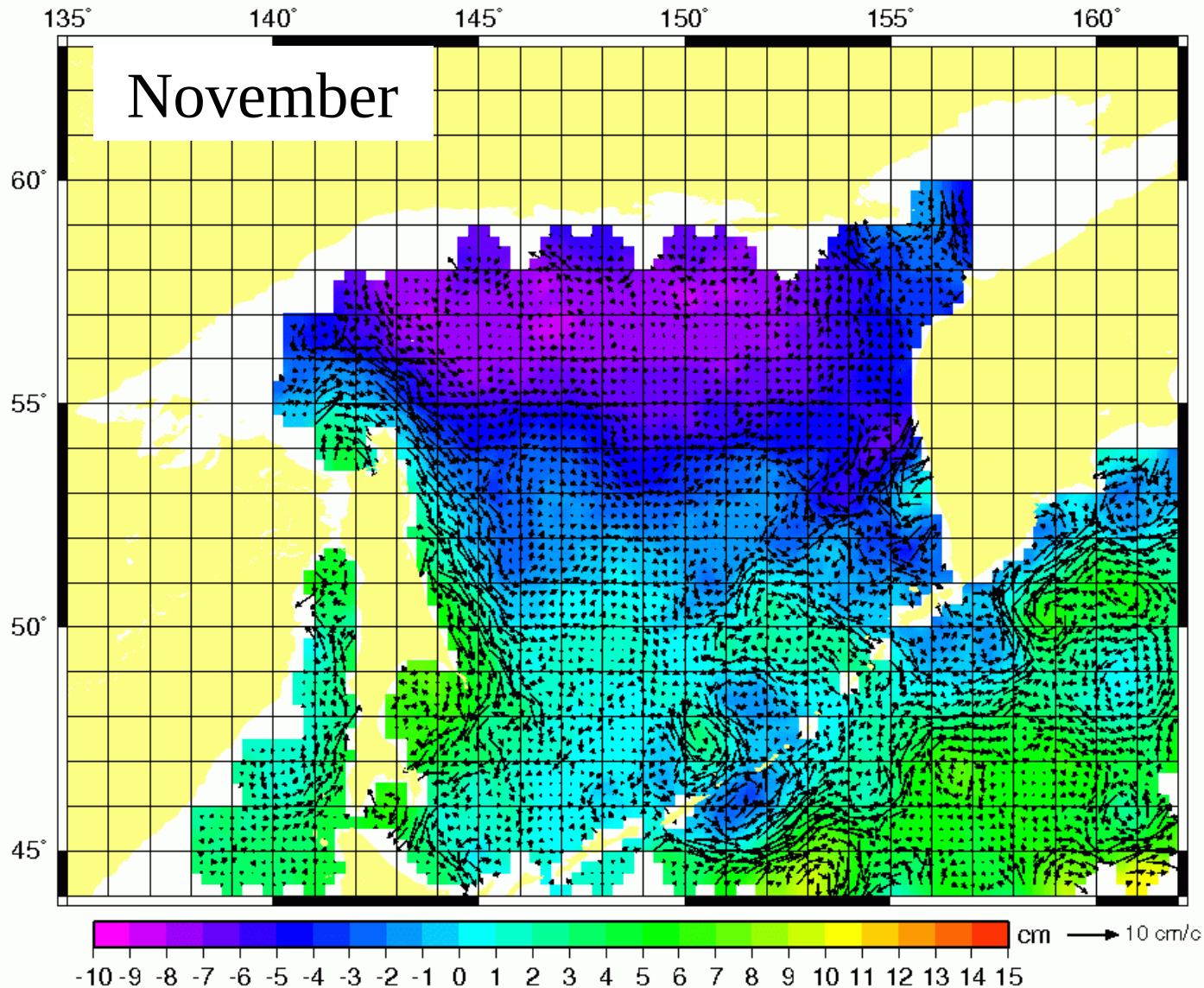


Multiyear mean sea levels and geostrophic currents



CONCLUSION

- We found low sea levels in the central part of Okhotsk Sea and high levels near coasts and strong intensification of cyclonic circulation in a winter time
- Low sea level and weak currents are occurred in the Okhotsk Sea in spring
- High levels in the central part of the sea and relatively weak anticyclonic circulation are occurred in summer
- Low sea levels are occurred in the northern part of Okhotsk Sea in October and November (induced by strong and stable northwesterly winds). We found intensification of East Sakhalin Current on the eastern Sakhalin shelf