



Storminess: Examples from Northern America and Europe

C Matulla (1) XL Wang (1) H Wan (1) H Alexandersson (2) W Schöner (3) H von Storch (4)

(1) Climate Research Division, Science and Technology Branch, Environment, Canada (2) Swedish Meteorological and Hydrological Institute, Sweden (3) Central Institute for Meteorology and Geodynamics, Austria (4) Institute for Coastal research, GKSS, Germany (email: Christoph.Matulla@ec.gc.ca; Fax:+1-416-739-5700)

In the wake of the climate change debate there is sometimes the opinion advanced that extra-tropical storminess has strengthened throughout the 20th century and that this strengthening is human induced. This belief has been proven wrong for N&NW-Europe by findings of the EU-project WASA (WASA 1998) and findings were confirmed by later studies (e.g. Wang and Swail 2001). We update datasets till 2005 across N&NW-Europe and enlarge the study region considerably into Central Europe by making data available for Vienna, Prague and Kremsmuenster. Geostrophic winds are analyzed by means of high percentiles in order to map long-term variations in storminess (Alexandersson et al 1998) back into the early 1870s. Results for N&NW and C-Europe are broadly consistent, showing high level storminess on the turn from the 19th to the 20th century followed by some calmer decades. The remarkable increase in storminess from the 1960s into the 1990s found for N&NW Europe is not shared by C-European storminess. However, decreasing storminess from the second half of the 1990s till now are to be observed in both regions again.

Besides the extension across Europe we also broaden the analysis into the West by considering Ammassalik in Greenland and Toronto, Halifax, Sable Island, Kuujuaq, Resolution island and Nottingham island in eastern Canada. In Canada the analysis period regarding the geostrophic wind extends back into the 1920s. There is a pronounced decadal scale variability featuring highest storminess centered around 1980, while winter storminess of recent years is decreasing in eastern Canada. The latter is consistent with the findings of Wang et al. (2006).

WASA 1998: Changing waves and storms in the northeast Atlantic. *Bulletin of the American Meteorological Society* 79(5) 741–760

Wang X L. and Swail V R. 2001: Changes of extreme wave heights in Northern Hemisphere oceans and related atmospheric circulation regimes. *Journal of Climate* 14 2204-2221

Alexandersson H, Schmith T, Iden K, Tuomenvirta H 1998: Long-term variations of the storm climate over NW Europe. *Global Atmosphere and Ocean System* 6 97–120

Wang, X. L., H. Wan, and V. R. Swail, 2006: Observed Changes in Cyclone Activity in Canada and Their Relationships to Major Circulation Regimes. *J. Climate*, 19, 896-915.