



**For Details, Contact:**

**Helve Kotli**

Estonian Meteorological and Hydrological Institute,  
10143 Tallinn, Rävåla 8, Estonia

Phone: 372 646 16 28  
Fax: 372 646 15 77  
e-mail: emhi @ online.ee

## Conference on European Tornadoes and Severe Storms

### **Tornadoes in Estonia and their synoptic background**

*Helve Kotli, Estonian Meteorological and Hydrological Institute, 10143 Tallinn, Rävåla 8, Estonia*

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Tornadoes and waterspouts in Estonia are too frequent phenomena to be ignored. Much attention has been paid to the description and studies of tornadoes and waterspouts there. One of the leading tornado researchers of our century was Johannes Peter Letzmann, who elaborated a kinematic theory for tornadoes, based on his own investigations. His concept of a Baltic tornado alley in Latvia and Estonia has been confirmed on the basis of more recent events.

The oldest recording of the tornado phenomena in the former province Livonia is dated 22 June 1795. During the period (1795-1997) we have some sort of evidence about 99 tornado cases. Among the total number there were 19 fixed series with 2 to 11 (average 5) individual whirls per series and 75 individual tornadoes. If tornadoes (including waterspouts and the cases when it has been impossible to determine the events) are counted as individual vortices, the total number amounts nearly to 200. The extraordinary, disastrous situation, never observed before, turned out during June and July 1998. 24 the most vigorous tornadoes occurred all over the mainland of Estonia. The tornadoes accompanied by thunderstorms and heavy rain ravaged the cornfields, gardens and giant century-old trees. One village (about 40 households) and a great number of farms and other buildings were demolished.

The analysis of synoptic background of tornado phenomena shows that common to the tornadoes which have occurred over Estonia are following features:

1. The cyclonic character of motions inside the vortex, which is confirmed by the orientation of fallen trees and also by the counter-clockwise character of breaking and twisting of the trunks of trees.
2. The most frequent occurrence of tornadoes in the late spring and summer period.
3. Most tornadoes move from Latvia and South Estonia to the north or north-east, which confirms the existence of tornado alley in Latvia and Estonia.
4. Strong tornadoes are mostly caused by the northward moving rare southern cyclones, transporting the hot and moist air northwards.

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