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Conference on European Tomadoes and Severe Storms

Some Aspects of the International Climatology of Tornadoes by Damage Classification

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Reports of tornadoes, including damage classification information, from several countries around the world (the United Kingdom, France, South Africa, Argentina, and the United States) have been collected from the literature. The reports suggest it is possible to create a simple statistical model of the expected distribution of tornadoes. For strong and violent tornadoes, the number of tornadoes decreases logarithmically with increasing damage. If this behavior is assumed to be representative of weaker events as well, the reported distribution can be compared to this modelled distribution. This makes it possible to estimate the number of unreported tornadoes. Substantial underreporting of weak tornadoes in most countries is the clearest signal that comes out of the comparison. For instance, in the United States, from the 1920s through the 1940s, the model indicates that it is likely that fewer than 10% of tornadoes were reported. The underreporting may be as high as 80% or more in France, and is likely to be even higher in other nations. Another possible factor is overrating tornado intensity, but there is no way to know to what extent this influences the climatological record. Implications of the underreporting for public awareness and civil defense planning and the need for systematic collection of severe weather reports will be discussed. In addition, a conceptual method for producing "pseudo-climatologies" of severe weather using radiosonde data will be introduced.