

# Figures

Fig. 1: The economic and insured losses caused by major natural catastrophes have increased dramatically in recent decades. The trend curves were plotted by **interpolating mean values** (from MUNICH RE, 2004)

## Great Natural Disasters, 1950 - 2003

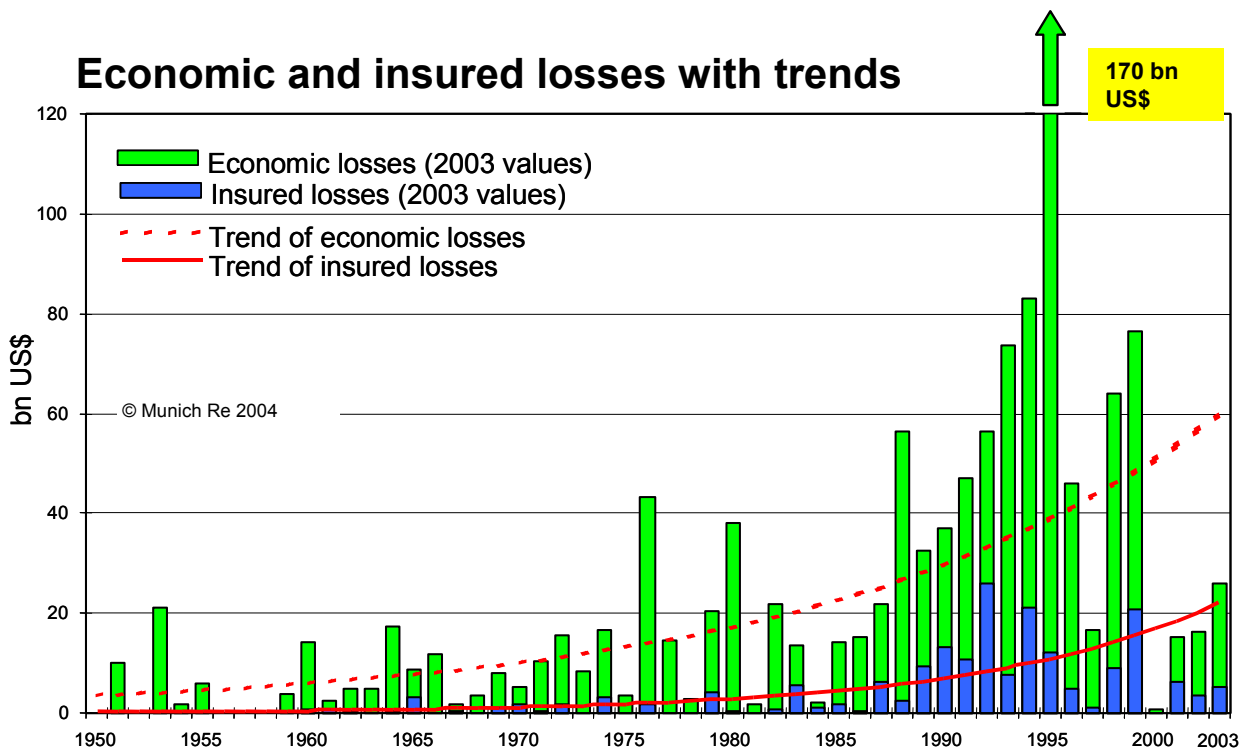
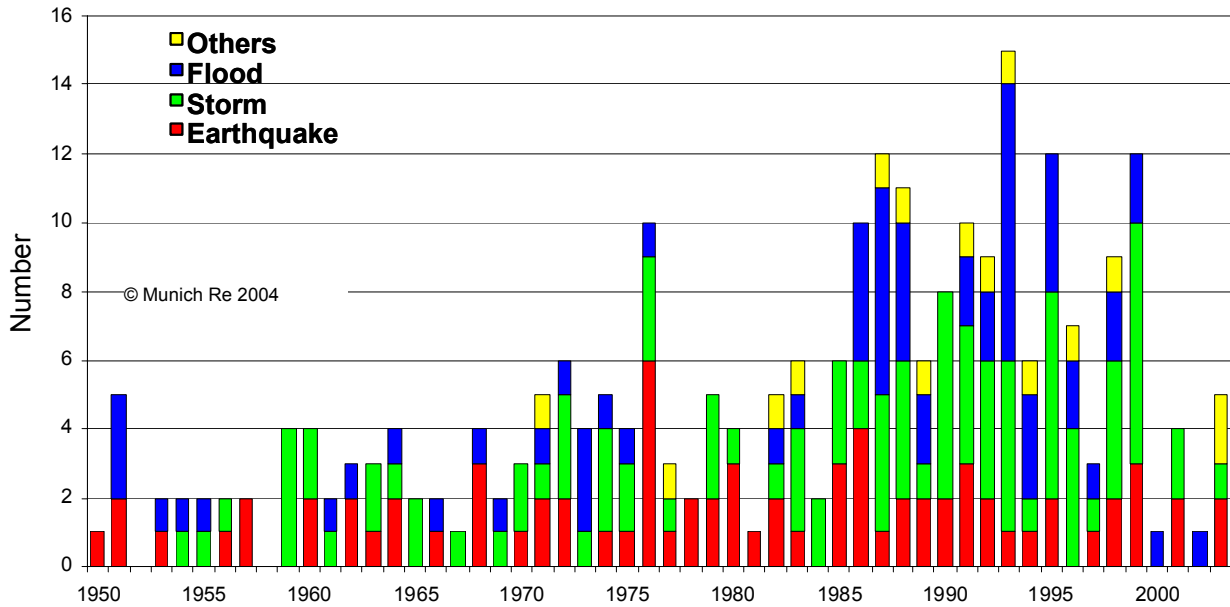


Fig. 2: A relatively slight shift in the mean temperature  $T$  increases the probability  $p$  of extreme temperature values. Taking as an example the average summer temperatures in central England, the diagram shows that warming of  $1.6^\circ\text{C}$ , such as is expected around the middle of the next century, will increase by a factor of 25 the probability of a temperature of  $17.3^\circ\text{C}$  (as was recorded in 1995), which thus far has been considered an extreme temperature. Thus, a 75-year event will become a quite normal event that occurs once every three years on average. In the future, heat waves and droughts will become correspondingly more frequent and extreme (= standard deviation).

## Increasing Probabilities of Extremes

Example: Summer Temperatures in Central England

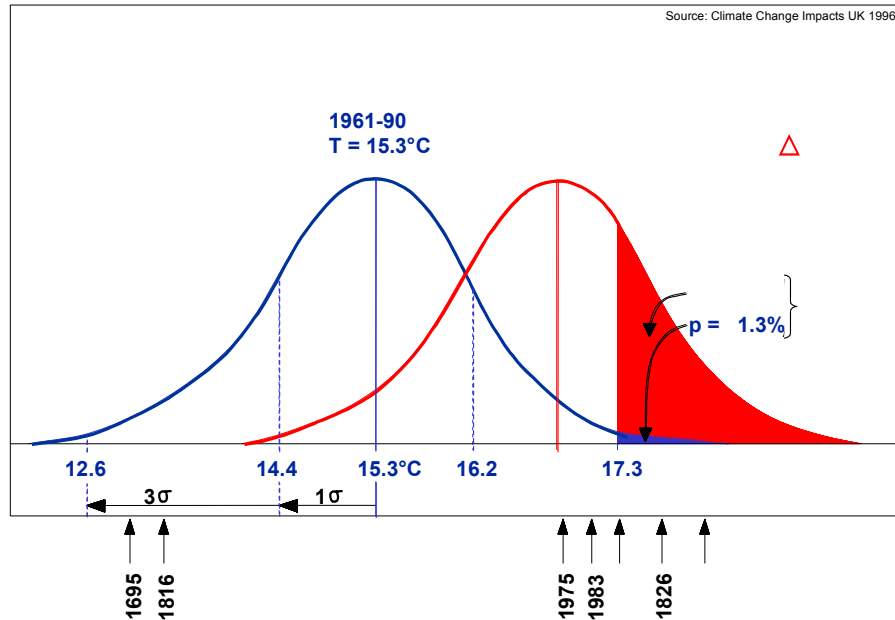


Fig. 3: Warmer winters mean more precipitation, which falls as rain even at higher elevations. The figure shows that warming of  $2^\circ\text{C}$  will be accompanied by an average increase in precipitation of 22%, and warming of  $4^\circ\text{C}$  by an increase of 44%. Such warming thus increases by a factor of three and eight, respectively, the probability that an extreme seven-day precipitation total of 100 mm will occur, which thus far was exceeded only by a flood in 1995. The risk of flooding increases commensurately.

## Trend of extreme winter rainfall in a warmer climate (example: Netherlands)

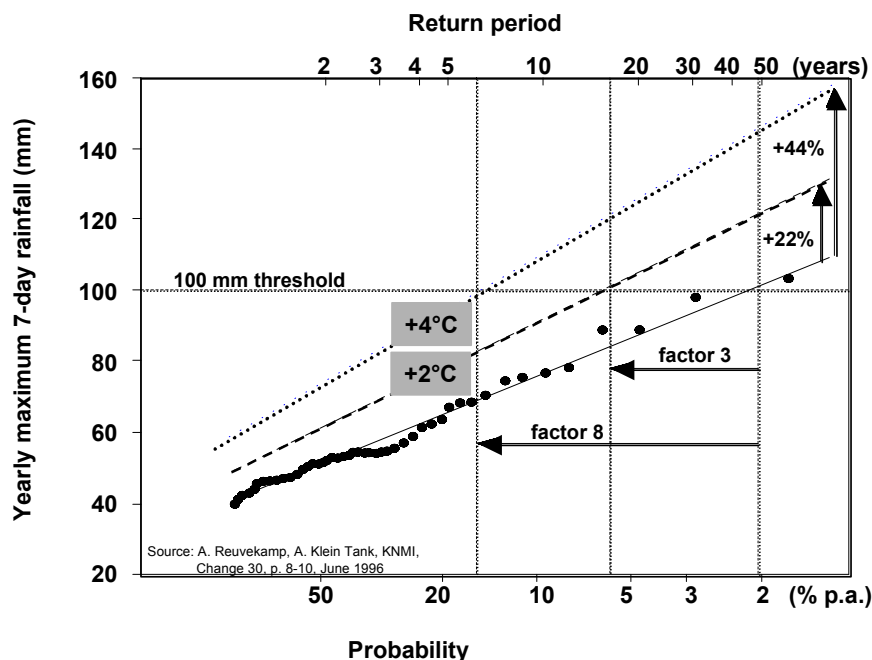


Fig. 4: The extraordinarily warm, snow-poor winters of recent years have caused eastern Europe's cold, high-pressure zone to become weaker and to withdraw to the east. This has repeatedly allowed storm fronts from the Atlantic, which were otherwise deflected to the north and south while still over the Atlantic, to penetrate deep into the east, through western and central Europe. If the anthropogenic greenhouse effect causes winters to become ever milder, Europe can expect to have a considerably greater risk of windstorms.

### European winter storm tracks

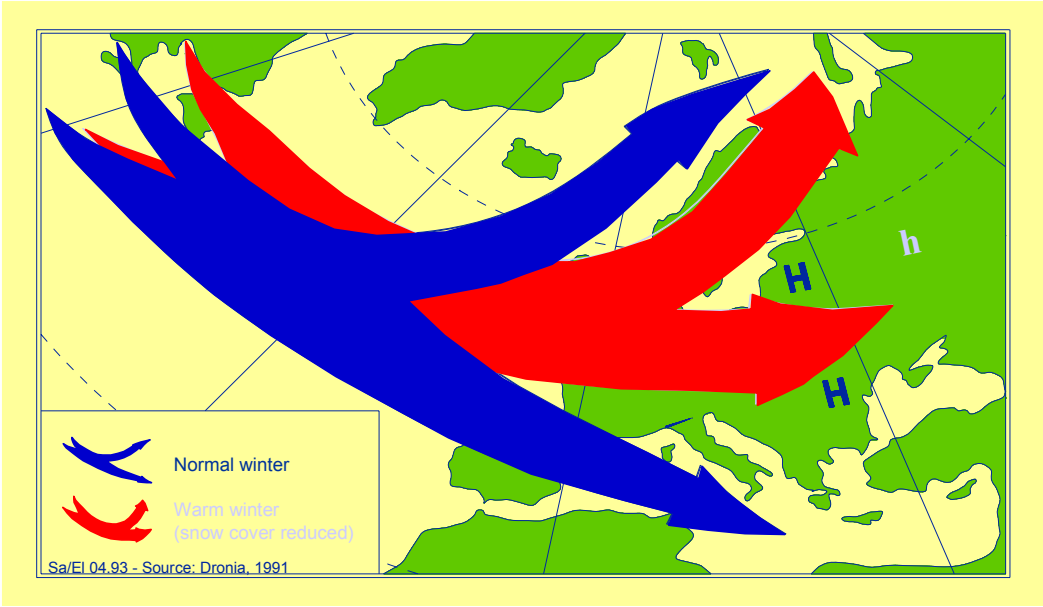


Fig. 5: Wind records from selected, representative German weather stations (example: Düsseldorf airport) show a clear increase in the number of windstorm days in recent decades, while the mean wind speed during this period has not changed significantly.

