TORNADOES IN BIRMINGHAM, ENGLAND, IN 1931 AND 1946-2005,
AND INFERENCES ABOUT BRITAIN’S TORNADO CLIMATOLOGY

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I. INTRODUCTION

In the context of needing to extend our knowledge of
Britain’s tornado climatology it would be useful to know the
ture rate (as opposed to recorded rate) of past tornadoes
across the whole country. Previous work has concentrated
on synoptic analyses (e.g. Bolton et al. 2003, Meaden et al.
2005) and detailed nationwide statistics (Meaden 1985,
Reynolds 1999). Unfortunately data gathering is incomplete
because of the great expanses of open country side that have
a low population density dotted only with vulnerable farms,
villages and small towns. A truer idea of the annual rate of
occurrence of tornadoes for particular regions comes from
studying the data for the great urban and suburban areas
where there is much damageable property and a high density
of affected residents and potential observers. Because of
this, a fresh approach has been attempted by using the city of
Birmingham as a specific case-study with regard to the risk
of tornado impact.

II. PRESENTATION OF RESEARCH

Birmingham, whose population of one million makes
it Britain’s second largest city, has a good record of reported
tornado incidences. Altogether, 15 significant tornado events
are known to have occurred over a central area of 150 sq.
km in this Midlands city on 12 different days in the 60 years
from 1946 to 2005. This is the result of reviewing for this
highly urbanised region actual tornado damage and tornado
sightings, most of them daytime occurrences at force T2 or
higher (minimum wind speed 37 ms$^{-1}$) where T values
are force indicators on the 0-to-10 Beaufort-based International
Tornado Intensity Scale (Meaden et al. 2007).

III. RESULTS AND CONCLUSIONS

Previous contributions to the study of Britain’s tornado
climatology produced data on return periods for wind-speed
risks at selected sites (Meaden 1985) or regional data based
on tornadoes that had affected a broad mixture of town and
country. In this paper—as an attempt towards gaining a
better insight towards a truer annual rate for actual tornado
occurrences in central England—it could be argued that a
long-term rate similar to that for central Birmingham 1946-
2005 might broadly apply to part or much of central England
if it was all urbanised. If, moreover, it was effectively
possible to consider all of central and southern Britain (area
$c. 10^5 km^2$) in this way, it would swell the estimated rate of
tornado occurrence for the same 60 years in this bigger area
to an average 165 tornadoes annually. This compares with
the latest recorded annual average for 2004, 2005 and 2006
of 77 tornadoes per year for all the British Isles whose area
is about three times bigger. Such information which is being
extended, refined and tested with regard to other cities may
be helpful to the building-standards research industry. A re-
appraisal of tornadoes as known for London is being done

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