

Interpretation of EFI and SOT

EFI and SOT are powerful tools for identifying potentially extreme weather compared to climatology for a given location and time of year. A high EFI value indicates that an extreme event is more likely than usual but the values do not represent probabilities of that event. Users should note:

- Extreme weather indicated by EFI and SOT:
 - has been assessed against IFS model climatology as derived for [M-climate](#), [ER-M-climate](#) or [S-M-climate](#) and these can differ from observed climatology.
 - does not necessarily indicate high impact as:
 - Rainfall has varying significance according to location (e.g. 2mm rainfall in the desert might be very unusual but have little effect).
 - Windstorms have greater or less impact depending upon the stability of structures or the leaf cover of trees.
 - Past history is important but is not directly accounted for (e.g. where heavy rain forecast when ground is already saturated).
- Products are only as good as the IFS model output:
 - Tropical cyclone representation is limited by resolution.
 - The threat from intense, very localised convection is unlikely to be fully captured in time or space.

Although a high EFI value indicates that an extreme event is more likely than usual, the values do not represent probabilities. Any forecasts or warnings must be based on a careful study of probabilistic (ENS) information, such as shown by [meteograms](#) and [plumes](#), and deterministic information (e.g. from HRES, taking into account the appropriate [weighting](#)) in addition to the EFI. Users should note:

- Potentially extreme situations (e.g. wind storms) are often characterized by high dynamical instability in the atmosphere and consequently large spread among ENS members. An extreme event might be preceded by wide-ranging shallow slope CDFs yielding EFI values that are not particularly high.
- The EFI may indicate to forecasters that anomalous wind speeds or rainfall rates are more likely than normal, but inspection of the CDF diagram is necessary to show what this means for a specific threshold (e.g. 5mm/12hr). If the climatological risk is 5% and the predicted probability is 20%, the risk is four times larger than normal, but any action will depend on whether this 20% is high enough for a specific end-user to undertake protective action.

Occasionally forecasts or warnings may be based on the likely impact of an event rather than the event itself. Users should note:

- Extreme EFI does not necessarily mean high impact (e.g. 2mm rain in the desert may be very unusual but have little physical impact).
- Past history is not directly accounted for by EFI but is important (e.g. the impact of a heavy rain event on saturated ground is greater than if ground can absorb the water).
- Windstorm impact can depend on whether trees are in leaf, whether ground is saturated, stability of buildings, etc.