Exceptional weather events

Type of event:

Forecasting D-Day landings

Date:

June 1944

Forecasting weather for D-Day landings

Detailed preparation for the planned sea invasion of German-occupied France during World War II began during 1943. Allied military leaders agreed that the invasion could only be attempted under certain conditions of lunar phase, tide and weather. The most important weather factors related to wind, visibility and cloud cover: ideally the selected date should have a 3-day spell of winds of less than force 4 (21 km/hour), visibility of over 5 kilometres with less than three-tenths of cloud cover below 8000 feet.

The date initially chosen for D-Day was June 5th, 1944, coinciding with a full moon when tides were suitable. The generally settled weather of May of that year deteriorated in early June, however. By June 3rd, a team of US and British forecasters had concluded that the weather on the 5th would not be suitable, as high pressure over France and low pressure northwest of Ireland would maintain strong southwesterly winds in the Channel. Seas would therefore be too rough for landings, while there would be too much cloud for successful bombing operations. Allied troop convoys already at sea were forced to take shelter along the south coast of England. However, a ridge developing behind the front offered a temporary window in the unsettled weather over the Channel on the 6th; strong winds were forecast to moderate late on the 5th, while cloud cover would diminish during the 6th. Based on this weather forecast, General Eisenhower ordered the invasion on the 6th to proceed.

Forecasts in 1944 were based on a combination of land-based observing stations, reconnaissance flights and a limited number of ascents from radiosonde balloons. Observations from the west of Ireland formed an important part of the critical forecasting decisions. Information available to German weather forecasters was more limited, as the German Navy had few remaining vessels in the Atlantic and their weather stations in Greenland had been closed down. Although early June was identified as a possible date for invasion by German military planners, the expected continuation of the disturbed pattern of weather was considered to make a landing impossible. As a result, some German troops on defensive duties were stood down, while many senior officers were absent. Although weather conditions on the 6th were not ideal, they were considerably better than on the next possible day later in June, when exceptionally stormy weather affected the English Channel.

Reanalysis of June 1944 weather

The European Centre for Medium-Range Weather Forecasts (ECMWF) has carried out a "reanalysis" of the weather of May and June 1944, where the observations from the time are reprocessed using modern data assimilation systems, in order to reconstruct weather patterns and forecast charts. The results, some of which are shown on the right, serve to illustrate several aspects of weather conditions leading up to D-Day and are in broad agreement with the forecasts issued at the time.

see website :
www.ecmwf.int/research/era/dday