Abstract

Probability-based weather forecasts (i.e., forecasts that quantify uncertainty) have been available for certain weather elements for over 40 years; for example, the probability of precipitation forecast. More recently, probability forecasts designed specifically for aviation have become widely available on the internet through two National Weather Service (NWS) forecast centers, the Aviation Weather Center (AWC) and the Environmental Modeling Center (EMC). Although these probability-based products are generally not recognized by the Federal Aviation Administration (FAA) for operational use, their potential is beginning to be recognized by the aviation community. For example, the Joint Program Development Office (JPDO) Next Generation Air Transportation System (NEXTGEN) Air Traffic Management (ATM)-Weather Integration Plan cites probabilistic forecasts as playing a key role in future air traffic management decision support tools by the year 2023 (JPDO, 2010). Specifically, the JPDO identified the integration of weather uncertainty information (i.e., probabilities and confidence information) into decision-support tools as the highest of four levels of weather integration into the air traffic management system.