

4.4 AN OVERVIEW OF THE WXCHALLENGE FORECASTING COMPETITION AND ITS USE AS AN EDUCATIONAL TOOL

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1. INTRODUCTION

The WxChallenge is a project developed at the Univ. of Oklahoma (OU) to bring a state-of-the-art, fun, and exciting forecasting contest to students at colleges and universities across North America. The challenge is to forecast the maximum and minimum temperatures, precipitation, and maximum wind speeds for select U.S. cities. The WxChallenge is open to all undergraduate and graduate students, as well as higher-education faculty, staff, and alumni.

Started in 2006, nearly 80 universities have participated in the contest and it has been utilized as part of the curricula for over 75 classroom courses at various institutions since inception. Thus, while the WxChallenge inherently has a challenging and exciting factor to it, it has been utilized heavily as an educational tool. As its popularity has grown, professors have seen the utility of the WxChallenge as a teaching aid and it has become a staple of many meteorological classes.

2. HISTORY

In early 2005, the local manager at the University of Oklahoma (OU) of a national forecasting contest (the National Collegiate Weather Forecast Contest; NCWFC) began to notice a trend of local forecaster attrition in the contest. This was due, in part, to antiquated methods that were utilized and associated difficulties for students to enter daily forecasts. As a result, many student forecasters simply stopped forecasting.

The local manager and another staff member from OU contacted the national managers of the forecasting contest to discuss possible methods to modernize the NCWFC to reverse this downward trend. After lengthy discussions, it was determined that the NCWFC was not interested in modernizing the contest. Thus, over the next few months, OU prototyped an internet, web-based forecast contest with the goal to provide students with an integrated system built upon simple forecast submission and rapid forecast verification.

An advisory board was established consisting of professionals from multiple universities who had lengthy experience in forecast contests. Their task is to be the democratic voice in any contest related issues and spur additional innovation in the operations of the contest.

In the fall of 2005, the WxChallenge began its beta period with a handful of schools and began official

operations in the fall of 2006 with 55 participating universities, 41 classrooms, and nearly 1600 participants. Currently, the WxChallenge has been used at 80 universities, 76 classrooms, and by over 2000 participants in its short three-year span.

3. CONTEST OVERVIEW

3.1 Contest Rules

The WxChallenge is open to all undergraduate and graduate students, faculty, staff, and alumni of a higher education institution. Each participant is grouped into one of five categories: (1) Freshman/Sophomore, (2) Junior/Senior, (3) M.S. or Ph.D. student, (4) faculty/staff, or (5) alumni. Forecasters compete not only against every other forecaster, but also against the forecasters of their category.

The contest operates in both the fall and spring semesters for ten weeks with forecasts submitted for one of five cities for two week periods during each semester. For each city and for each verification day (Tuesday, Wednesday, Thursday, and Friday), forecasters submit values for the high temperature, low temperature, maximum sustained wind speed, and total cumulative liquid precipitation for a 24 hour period. After two weeks (eight total forecasts), the top forecasters in each category are determined to be the winners for the city.

Those forecasters who participate for both semesters (i.e., an entire academic year) are eligible for awards based on cumulative forecasting excellence. Additionally, the top 64 forecasters at the end of the year are invited to participate in a head-to-head tournament, with seedings determined by cumulative



Figure 1. The WxChallenge team trophy award to the team with the best score at the end of the year.

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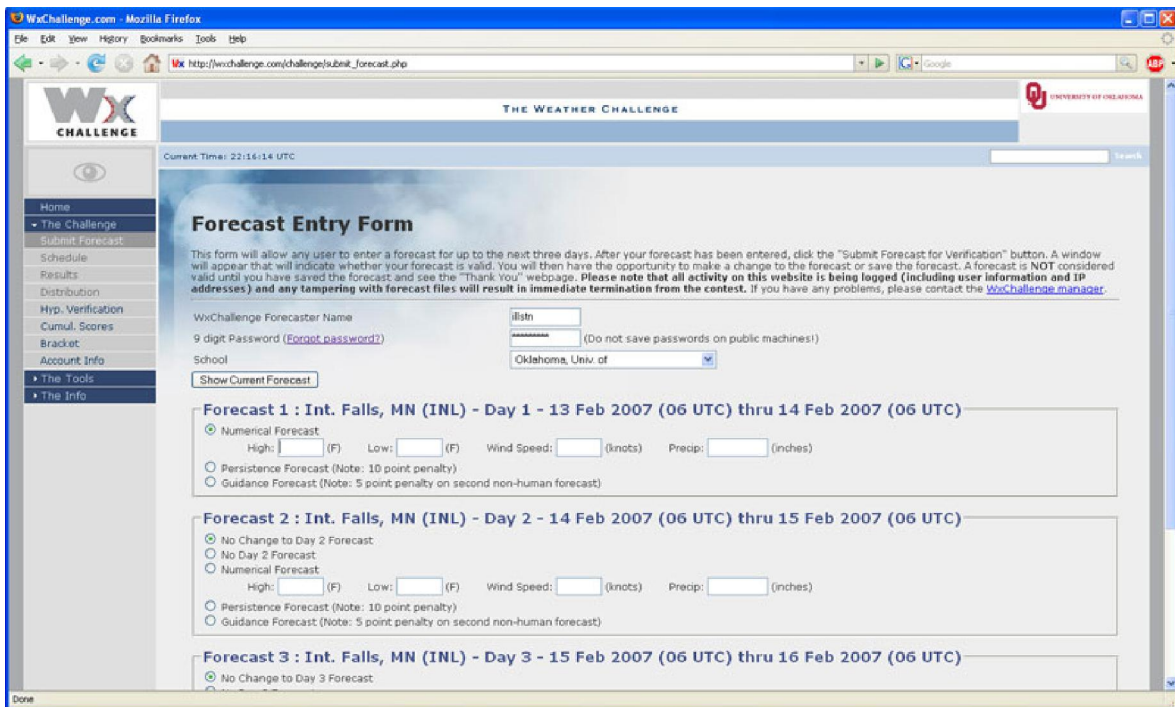


Figure 2. The forecast entry page for the WxChallenge forecasting competition.

forecast excellence during the year. In addition, the team (i.e., academic institution) with the top score at the end of the year receives the WxChallenge Team Trophy (Fig. 1) for display at their university. The trophy contains placards of all past winners of the team trophy.

3.2 WxChallenge Website

The website for the WxChallenge forecasting competition (<http://wxchallenge.com>) is the main portal for all aspects of the competition. From the website, forecasters have a variety of forecast and verification tools at their fingertips. To ease the burden of local managers having to collect forecasts each forecaster can log on to the website and submit their own forecasts directly to the contest (Fig. 2). Additionally, at the close of forecasts for the day (00 UTC), all forecasts are publicly displayed with histograms to provide immediate feedback concerning the distribution of entered forecasts (Fig. 3).

Every hour, weather observations from the verification site are collected and processed to update the results of the contest. Forecasters can check their standings in their classification, their school, their enrolled class (if applicable), and for all forecasters participating in the contest at any time. Participants also have the ability to enter hypothetical values to envision how scores may be distributed under various verification scenarios. Additionally, every hour the yearly cumulative standings as well as their tournament rankings and seeds are updated and available to the forecasters.

Finally, in addition to specific contest related items, general aspects to the website to help all participants

are also provided including internet links to various weather data sources as well as public and private forums to share forecasting tips or have general weather discussions.

4 EDUCATIONAL TOOL

National forecasting competitions, by design, are an excellent teaching tool. Many students become geographically focused on everyday local conditions with regards to understanding meteorology and its impacts with respect to forecasting. By introducing students to various forecast locations across North America, they learn firsthand the impacts of terrain, maritime effects, and the consequence of microscale conditions in addition to mesoscale and synoptic scale atmospheric phenomena. Additionally, students learn the effectiveness and biases of numerical weather prediction models. Some schools or professors use the online forums as a meeting place to share and discuss forecast techniques and learn from past mistakes. The forums provide a certain degree of privacy (and freedom) to allow students to pose questions that they may or may not ask during a standard classroom environment.

The main benefit of the WxChallenge is its use in the classroom as a teaching tool. Professors have the ability to have their students separated out from the rest of the forecasters so that they can assess the progress of their pupils. This is one aspect of the WxChallenge that is unique from other forecasting contests. At a quick glance, the professor can determine whether students are struggling with various aspects of forecasting and

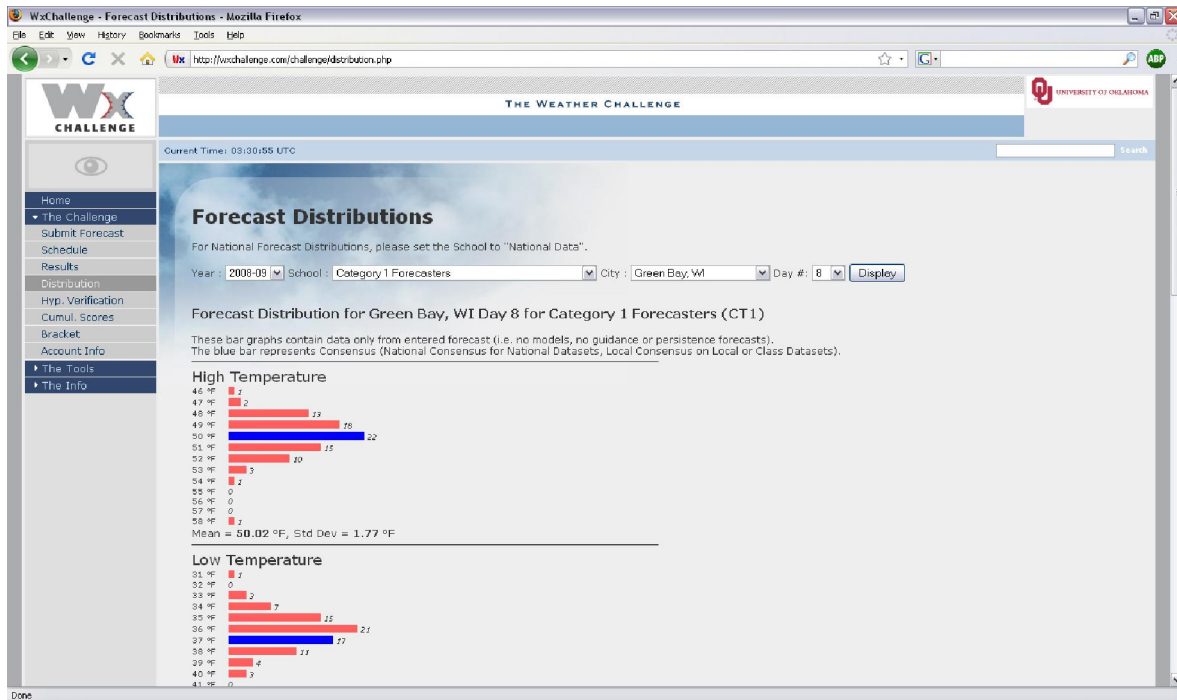


Figure 3. Distribution of forecasts shown on the WxChallenge website.

provides feedback to the instructor regarding whether any additional teaching material is needed.

However, a more critical benefit of the WxChallenge is its ability to remove additional work from the professors. While many instructors recognize the benefits of consistent forecasting, much time is required to individually organize a classroom evaluation strategy. Thus for an individual instructor to design and implement a forecast evaluation criteria removes resources (especially time) that could be better used for course preparation. The WxChallenge removes this burden and allows instructors to focus more time on their true task at hand – instructing students on meteorology and weather forecasting. As such, the WxChallenge is being worked into many professors standard teaching and is expanding beyond synoptic and weather forecasting classes. For example, one professor found the WxChallenge so useful that their meteorology department is working towards having every student participate in the contest before they graduate.

5 CONCLUSIONS

The WxChallenge is a project developed at the Univ. of Oklahoma that has brought a state-of-the-art, fun, and exciting forecasting contest to students enrolled at colleges and universities across North America. Its use as an educational tool in the collegiate classroom has increased since inception and will continue to grow. By removing the workload from professors, it provides them more time to devote towards teaching meteorology and weather forecasting.