

Jefferson County Smoke Management Pilot Balloon Observations, 2011

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Abstract

Pilot balloon (Piball) observations are a major component of the daily decision-making process used in managing open field burning of grass seed and wheat fields in Jefferson County. Piballs are used to track local wind direction and speed. Piballs are released daily from the Central Oregon Agricultural Research Center (COARC) between 10:30 am and 3:30 pm. In addition, Piballs released at potential burn sites allow for more accurate decisions under marginal conditions when errors are most likely to occur. The Piball is essential in minimizing adverse smoke impacts on local communities.

Introduction

The Piball program that began in 1998 incorporates the weather balloon information into the daily routine along with the information the Jefferson County Smoke Management Coordinator receives from the Oregon Department of Agriculture Weather Center. Also, using the Real-Time Weather Data courtesy of US Bureau of Reclamation AgriMet Network, which can be found on the Jefferson County Smoke Management website. The objective is to provide real time wind patterns, wind speed and wind direction information for the Smoke Management Coordinator to determine whether burning will be allowed.

Materials and Methods

During the field-burning season from July 25 to September 23rd, daily balloon releases occurred throughout the day between 10:30 am and 3:30 pm. The release times and locations are requested daily by the Smoke Management Coordinator. Air temperature, relative humidity, and surface wind direction and speed are documented at the time of the Piball releases using the AgriMet weather station at the Central Oregon Agricultural Research Center (COARC). The Piball is used to verify the forecast for the upper level wind direction, speed and mixing height. Wind directions and speeds are determined at 1-minute intervals for a period of 10 minutes using an observation Theodolite System and a 26 inch diameter helium filled balloon. The software program, Piball Analyzer, was developed by the Oregon Department of Agriculture (ODA) to aid in the analyzing of the Piball information in three different components. The first is the Piball sounding, a spreadsheet translating the azimuth (azimuth are angles used to define the apparent position of an object in the sky, relative to a specific observation point) and elevation readings from the Piball into wind direction and average wind speed. The second is the hodograph, which charts wind direction. The third is the profile page, which graphs wind speed. The results are

then provided to the Jefferson County Smoke Management Coordinator who uses this information in conjunction with the aircraft soundings and the ODA burn forecast to determine the field burning status for the day.

Results and Discussion

In the 2011 burning season there were a total of 11,630 acres burned, 3,410 acres of grass burned and 8,220 acres of wheat. Emphasis was put on burning more acres on better burn days and not allowing burning on marginal days, when smoke may impact local communities. The 2011 season had a cool, wet spring and early summer, which substantially delayed the harvesting of the crops, which pushed the majority of the field burning back to the last few weeks of the season. Along with this challenge, we also dealt with local wildfires that blanketed the area with smoke for four straight weeks.