

Jefferson County Smoke Management Pilot Balloon Observation, 2009

Linda Samsel and Marvin Butler

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 in tracking local wind direction and speed. Piballs are released daily from the Central Oregon Agricultural Research Center between the times of 10:30 am and 2:30 pm. Piball releases allow for more accurate decisions under marginal conditions. The Piball is essential in minimizing adverse smoke impacts on local communities.

Introduction

The Piball program that began in 1998 incorporates 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. The objective is to provide real time wind patterns, wind speed and wind direction information for the Smoke Management Coordinator when making a decision whether to allow burning.

Methods and Materials

Several daily balloon releases occurred throughout the day between 10:30 am and 2:30 pm. The release times and locations are requested daily from the Smoke Management Coordinator. 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 10 minutes during each release using an observation Theodolite System and a 26-inch-diameter helium-filled balloon. The software program, Piball Analyzer, is used to analyze the Piball information in three different components. The first is the Piball Sounding, a spreadsheet translating the azimuth 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 determining field burning status for the day.

Results

In the 2009 burning season there were a total of 10,678 acres burned. There were 5,013 acres of grass burned and 5,665 acres of wheat. The open field burning began on July 27, and ended on September 25. Emphasis was put on burning more acres on the better burn days and not allowing burning on marginal days, when smoke may impact local communities.

The Piball program is an important tool for the determination of real time conditions. However, it is particularly helpful on marginal days to assist the program coordinator in making the decisions whether to allow burning when conditions are either changing or hard to discern.