

Pilot Balloon Observations, 2014 Jefferson County Smoke Management

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Abstract

Pilot Balloon (Pibal) 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. Pibals are used to track upper level wind direction and speed. During burning season, Pibals are released daily from the Central Oregon Agricultural Research Center between 10:30 am and 3:30 pm. In addition, Pibal releases at potential burn sites provide more accurate decision-making when presented with marginal conditions. The Pibal is essential to minimizing adverse smoke impacts on local communities.

Introduction

The Pibal program began in 1998 and incorporates weather balloon data with information the Jefferson County Smoke Management Coordinator receives from the Oregon Department of Agriculture (ODA) Weather Center. Pibal data compiled with Real-Time Weather Data, courtesy of the US Bureau of Reclamation AgriMet Network, can be found on the Jefferson County Smoke Management website (www.jeffcosmoke.com). The objective of the program is to provide real time wind speed and direction data for the Smoke Management Coordinator to determine whether burning will be allowed.

Materials and Methods

During the 2014 field-burning season, July 21 through September 26, 2014, daily balloon releases were made as requested throughout the day. Release times and locations were determined by the Smoke Management Coordinator based upon real-time needs assessments. Air temperature, relative humidity, and surface wind direction and speed are documented using Pibal releases and the AgriMet weather station located at the Central Oregon Agricultural Research Center.

Wind direction and speed are determined at one-minute intervals for a period of ten minutes using an observation Theodolite System that includes a twenty-six inch diameter helium filled balloon (Pibal). Pibal Analyzer, a software system developed by the Oregon Department of Agriculture (ODA), analyzes Pibal generated data and the Coordinator uses this in conjunction with aircraft soundings and the ODA Weather Center forecast to determine field burning status on a daily basis.

Results and Discussion

During the 2014 field-burning season, growers burned a total of 9,560 acre. This included 4,900 acres of grass and 4,660 acres of wheat. The 2014 season began one-week earlier than past seasons to allow for no-burn days created by several community events.

The local release of Pibals is a valuable tool to determine and verify the mixing height of smoke during optimal burn times and provides the only available method to detect stable air layers. Pibals are particularly helpful on marginal burn days when conditions are changing or hard to discern. It is on these marginal days, when the conditions are unclear, that risk is highest for smoke intrusion into populated areas. Using Pibals at the site of a potential burn remains a valuable tool in smoke management decisions.