



United States Department of Agriculture

Office of the Secretary
Washington, D.C. 20250

JUN 14 2010

The Honorable Dianne Feinstein
Chairman
Subcommittee on Interior, Environment,
and Related Agencies
Committee on Appropriations
United States Senate
131 Dirksen Senate Office Building
Washington, D.C. 20510

Dear Madam Chairman:

Enclosed is a report that outlines the U.S. Forest Service's initial estimate of anticipated wildland fire suppression costs for fiscal year (FY) 2010. This estimate is provided to satisfy requirements of Section 502(h)(3) of the Flame Act, which requires the Secretaries of Agriculture and the Interior to submit an estimate of the anticipated wildfire suppression costs for the fiscal year during the first weeks of March, May, and July of each year.

The current estimate of Forest Service fire suppression costs for FY 2010 is \$1.273 billion, with 90 percent confidence that the costs will fall between \$1.033 billion and \$1.533 billion. These estimates are based on the best climate, weather, and other related data currently available, as well as the best current models and other analytical tools to estimate fire costs. However, it should be noted that the estimate was created at the beginning of the Agency's fiscal year and is based on weather prediction models that are being influenced by the El Niño-Southern Oscillation. This climatic influence has generated wetter than normal conditions in the Southwest and the South, which may delay fire activity in those regions of the country. The scheduled reports for May and July will provide more reliable cost estimates as weather and resource conditions evolve.

A similar letter is being sent to Senator Lamar Alexander, Chairman James P. Moran, and Congressman Michael K. Simpson.

Sincerely,

A handwritten signature in black ink, appearing to read "Tom Vilsack", written over the printed name.

Thomas J. Vilsack
Secretary

Enclosure



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Washington, D.C. 20250

JUN 14 2010

The Honorable James P. Moran
Chairman
Subcommittee on Interior, Environment,
and Related Agencies
Committee on Appropriations
U.S. House of Representatives
B-308 Rayburn House Office Building
Washington, D.C. 20515

Dear Mr. Chairman:

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A similar letter is being sent to Congressman Michael K. Simpson, Chairman Dianne Feinstein, and Senator Lamar Alexander.

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Thomas J. Vilsack
Secretary

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JUN 14 2010

The Honorable Mike Simpson
Ranking Member
Subcommittee on Interior, Environment,
and Related Agencies
Committee on Appropriations
U.S. House of Representatives
1016 Longworth House Office Building
Washington, D.C. 20515

Dear Senator Simpson:

Enclosed is a report that outlines the U.S. Forest Service's initial estimate of anticipated wildland fire suppression costs for fiscal year (FY) 2010. This estimate is provided to satisfy requirements of Section 502(h)(3) of the Flame Act, which requires the Secretaries of Agriculture and the Interior to submit an estimate of the anticipated wildfire suppression costs for the fiscal year during the first weeks of March, May, and July of each year.

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Thomas J. Vilsack
Secretary

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Washington, D.C. 20250

JUN 14 2010

The Honorable Lamar Alexander
Ranking Member
Subcommittee on Interior, Environment,
and Related Agencies
Committee on Appropriations
United States Senate
125 Hart Senate Office Building
Washington, D.C. 20510

Dear Senator Alexander:

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Forest Service Suppression Cost Forecasts and Simulation Forecast for FY 2010

Jeffrey P. Prestemon, Southern Research Station, Forest Service
Krista Gebert, Rocky Mountain Research Station, Forest Service
Karen Abt, Southern Research Station, Forest Service

November 13, 2009

Executive Summary

Fiscal year (FY) 2010 emergency suppression expenditures, including cost pool projections and national aviation contracts (estimated at \$365 million), are forecast to be \$1,273 million, with a 90 percent confidence band from \$1,013 million to \$1,533 million. Ignoring the Cost Pool and aviation charges, overall costs are forecast to be slightly higher than in FY 2009, falling among the middle tercile (third) of observed costs for the past 15 years (1995-2009). The relatively moderate cost forecast, compared to recent history, is linked mainly to a forecast of continued El Niño conditions in the Pacific Ocean. These warm-water conditions in the eastern Pacific are correlated with wetter than normal conditions in the southern part of the United States.

Though national expenditures are forecast to fall in the middle tercile of costs, Region 5 and Regions 8 and 9 are forecast to fall in the upper tercile of costs. Region 5 has demonstrated a recent trend of steeply increasing costs that are partly explained by negative values of the Pacific Decadal Oscillation, which are forecast to continue and are linked to higher costs in that region. Region 8 and 9, which have mixed relationships to El Niño, also had moderate drought conditions (as measured by the Palmer H-Index), as of September 2009, resulting in a forecast of above-normal costs.

This forecast is based upon historical Forest Service fire suppression spending patterns from FYs 1995-2009. Therefore, it does not reflect any possible cost savings that might occur in FY 2010 due to changes in spending patterns brought about by management goals or operational efficiencies. Actual FY 2010 fire suppression expenditures may vary from the forecasted confidence intervals.

Overview

Background

The high level of suppression expenditures since FY 2000 has led to budgetary complications for the agency, often forcing spending reallocations within fiscal years. To give the Forest Service some advance warning (before the summer fire season ensues) of possible funding problems, researchers have developed models that can provide forecasts in the fall and the spring of the current fiscal year. This research is a collaborative effort of the Rocky Mountain Research Station (Krista Gebert) and the Southern Research

Station (Jeffrey Prestemon and Karen Abt), funded by National Fire Plan research and Forest Service Fire and Aviation Management.

Modeling Framework for the 2010 Fall Current Year Model

This latest effort forecasts FY 2010 costs for regions or regional aggregates, using climate and drought data available at the beginning of the fiscal year. Suppression cost data are based on Forest Service accounting databases as compiled by the Forest Service Rocky Mountain Research Station. The dataset includes expenditures for the nine land management regions, as well as for the Rest of the Forest Service (RFS), which includes the National Offices, Research Stations, and the National Interagency Fire Center. Due to changes in the accounting of suppression expenditures at the regional level (starting in 2007), we have had to make adjustments to our dataset in order to maintain consistency among years. This has resulted in a much shorter time series of consistent data upon which to build the forecasts. Previously, the forecast models were built using data from FY 1977 onward. The new dataset is significantly shorter, running from FY 1995 through FY 2009.

The forecast model is a set of statistical equations, each corresponding to individual regions or regional groupings. The use of the shorter (1995-2009) time series has necessitated some changes in the specification of the equations, both in terms of the variables used and the number of variables appearing in them. Additionally, we made changes to the regional groupings. Previously, an aggregate forecast was produced for Regions 1-6, with the remaining regions being modeled separately, for a total of five equations. With this forecast, we regrouped regions based upon recent cost correlations among regions, resulting in six cost forecast equations: (1) Region 1 and 4, (2) Region 2 and 3, (3) Region 5, (4) Region 6, (5) Region 8 and 9, and (6) Region 10 and the RFS. Region 10 was added to RFS because of the small amount of expenditures occurring in that region.

These six regional suppression cost equations are estimated simultaneously, and the equation interrelationships are captured in making agency-wide forecasts. Forecasts are made for each of the regional cost equations and for the agency as a whole. These individual cost equations are each specified slightly differently but include some combination of broad scale climate indicators, such as the Southern Oscillation Index, the Niño-3 sea surface temperature anomaly, the Pacific Decadal Oscillation, the North Atlantic Oscillation, and drought indices (Palmer H indices) as well as a random error component. The result of the estimation is a set of parameter estimates (relating the independent variables to the suppression cost) and a random equation error distribution.

Monte Carlo simulation methods are applied to the estimated equations to develop probability distributions of the cost forecasts for each of the six equations and for the agency as a whole. The agency total forecast is simply the summed forecast made with each of the six individual cost equations. The Monte Carlo method involves adding random errors to each equation's parameter estimates and to each equation's residual error. The Monte Carlo method also captures the interrelationships among parameters of

the cost models and the equation residual errors among regions. This method allows us to provide a median cost forecast for each cost equation (region or regional aggregate) and confidence intervals around the median cost. It also allows us to make inferences about the probability that the appropriated budget for emergency fire suppression will be sufficient to cover realized costs for the fiscal year.

FY 2010 Results

FY 2010 emergency suppression expenditures for the agency as a whole, including cost pool and aviation charges, are forecast to range, with 90 percent confidence, from \$1,013 million to \$1,533 million, with a median forecast of \$1,273 million (Table 1 and Figure 1). The agency-wide forecast is further broken out by region or regional aggregate in Table 1.

Including regular, supplemental and Flame Fund appropriations, the total amount available for emergency suppression in FY 2010 is \$1,536 million, which, by our calculations, has a 95 percent probability of being sufficient to cover expenditures in FY 2010

Table 1. Fiscal Year 2010 Emergency Suppression Cost Forecasts, by Region, Current (FY 2010) Dollars (Cost Pool and Special Aviation Charges Included in RFS)							
	Region 1 & 4	Region 2 & 3	Region 5	Region 6	Region 8 & 9	Region 10 & RFS	Total
2010 \$ Million							
Median	85	86	333	123	94	551	1,273
95% Confidence Lower Bound	0	0	190	48	50	438	962
95% Confidence Upper Bound	307	204	478	198	136	666	1,583
90% Confidence Lower Bound	0	0	212	60	57	456	1,013
90% Confidence Upper Bound	271	185	456	186	129	647	1,533

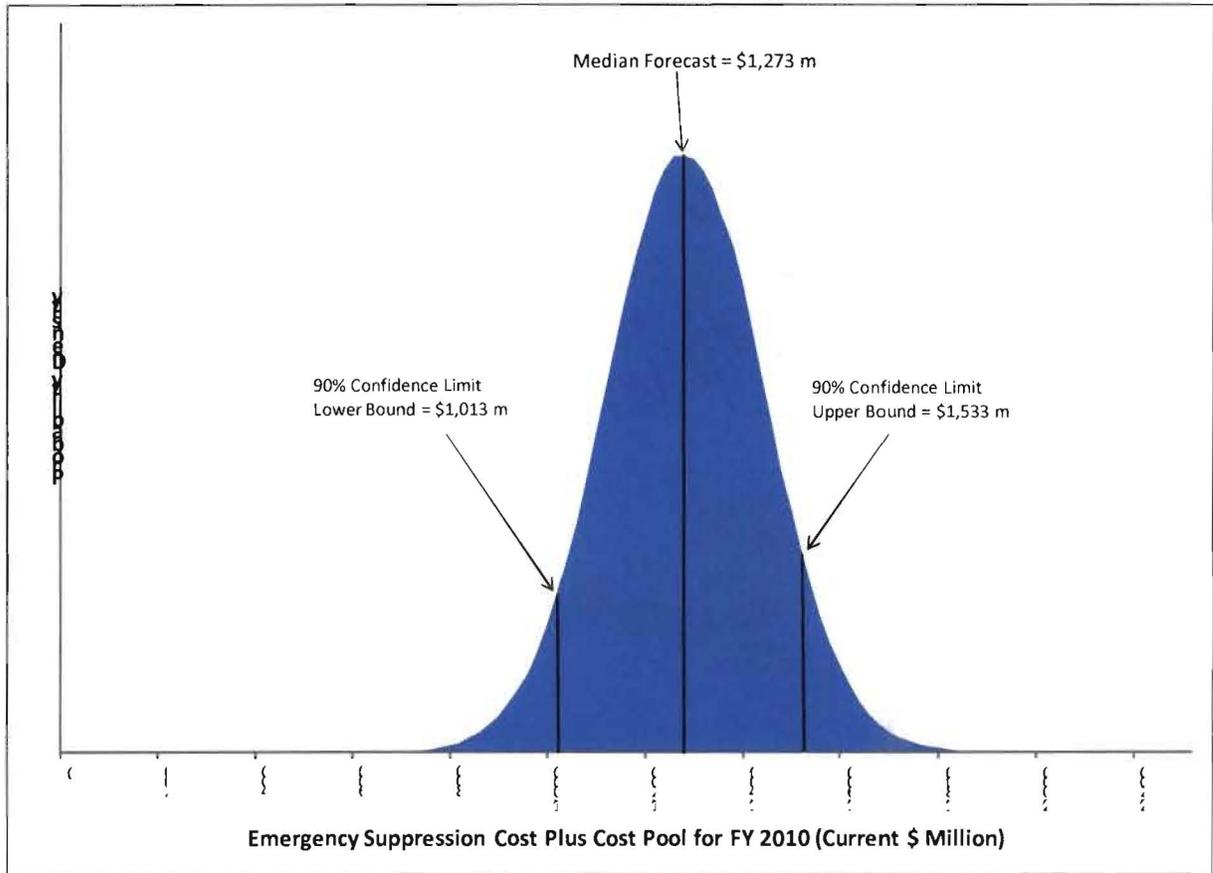


Figure 1. Fiscal Year 2010 emergency suppression expenditure forecast probability distribution.

Table 2. Fiscal Year 2010 Emergency Suppression Cost Forecasts (Cost Pool and Special Aviation Charges Included), by Percentiles (FY 2010) dollars	
Probability (%) of Falling Below Indicated Dollar Amount	Realized Amount (\$ Million 2010)
1	902
5	1,013
10	1,070
20	1,139
30	1,190
40	1,232
50	1,273
60	1,313
70	1,356
80	1,406
90	1,475
95	1,533
99	1,642

Compared to the previous 15 years, forecast costs for four of the regions or regional aggregates are anticipated to be in the middle tercile (third) of costs, and two are likely to fall in the upper tercile (Table 3). The agency-wide cost is also predicted to be in the middle tercile of costs compared to costs experienced in the previous 15 years.

Table 3. Fiscal Year 2010 Emergency Suppression Cost Forecasts, by Terciles (Excluding Cost Pool and Special Aviation Charges)		
Region or Aggregate	Tercile of Costs Expected, Last 15 Years	Tercile of Costs Expected, Last 34 Years
R 1 & 4	Middle	Middle
R 2 & 3	Middle	Upper
R 5	Upper	Upper
R 6	Middle	Upper
R 8 & 9	Upper	Upper
R 10 & RFS	Middle	Upper
Total	Middle	Upper

Model Evaluation

Figure 2 documents the predictions of aggregate suppression costs using the newest Fall suppression cost forecast model compared to observed costs. Figure 2 also shows the forecast for FY 2009, shown here without cost pool and other special charges in order to facilitate comparison among years.

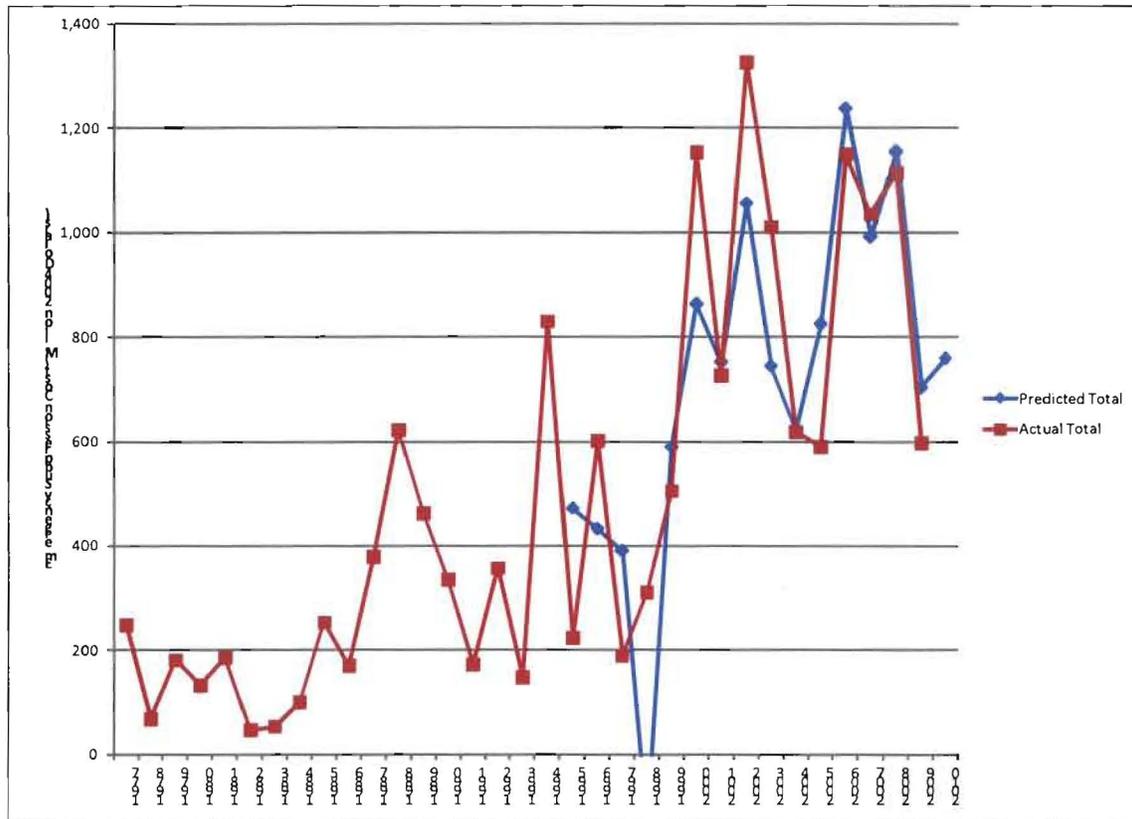


Figure 2. Fall current year forecast model evaluation, and the FY 2010 forecast (excluding the Cost Pool and special aviation charges).

For more information, contact:

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