General Management Evaluation Recommendations
LANDFIRE Program Strategy and Operational Improvements

December 14, 2009

The LANDFIRE Project is transitioning to an Operations and Maintenance program. A general management evaluation (GME) was initiated to improve the effectiveness of future program efforts. The GME was conducted by an independent; third-party review team retained by METI, Inc. The GME team conducted 110 interviews and reviewed program documents as the foundation for its report. The GME is founded upon a series of interviews and document reviews focused on four primary areas:

1. Awareness and understanding of LANDFIRE and its data products
2. Utility of data products within wildland fire management and other resource areas
3. Organizational and operational improvements needed within the LANDFIRE Program
4. Organization and management of the overall collection of federal wildland fire management data and applications

Overview

LANDFIRE Program staff and leadership are to be commended for accomplishing project objectives on time and within budget. The initial project effort exhibited strong leadership, attention to project management principles, attention to data quality and integrity, and use of science-based methodologies. The working relationships and partnerships developed in the LANDFIRE Project provide a solid foundation for Department of the Interior agencies, the USDA-Forest Service, and The Nature Conservancy to establish a robust and effective LANDFIRE Program.

Principal Recommendations

Recommendations presented in this report should not be considered as a "punch list" of actions that will make improvements in the LANDFIRE Program, but rather as a series of sequential decisions that set the stage for addressing many of the more significant issues encountered (e.g., organization design, project governance, data quality and use, etc.). Issues of budget commitment, stability, and responsibility will need to be addressed in conjunction with these recommendations.

1. **Develop a contemporary vision and program strategy** - Critical decisions must be made soon regarding the future course of LANDFIRE to guide the transition to a LANDFIRE Program. A decision regarding LANDFIRE's role as a data provider for a broad range of users (the "LAND" in LANDFIRE) vs. a more narrow focus that supports of wildland fire decision support systems as its primary mission (the "FIRE" in LANDFIRE). A strategic plan must then be developed to carry out the vision of the program sponsors and partners.

2. **Assess coordinated governance and organization design** - Organization and governance of the LANDFIRE Program must be responsive to the vision and scope defined by agency leadership. The

LANDFIRE Program should be organized to support its primary mission of providing high quality, objective data products needed to support wildland fire management and landscape conservation approaches and initiatives. Executive leadership and governance of LANDFIRE and other national wildland fire decision support systems should be combined.

3. **Establish LANDFIRE National data as a base federal program** - LANDFIRE data standards and data products should be adopted by wildland fire leadership as a "base Federal program" and as national data standards for supporting wildland fire management. Key data quality improvements require that NRCS soil survey data are incorporated into the LANDFIRE production procedures to improve the accuracy of data products for grasslands and shrublands. Address resolution of issues prohibiting the FGDC vegetation subcommittee from adopting a data standard for finer-scale existing vegetation data products to allow LANDFIRE to meet the demand for these products.

4. **Improve coordination and marketing** - Establish a dedicated joint communication and marketing effort with other wildland fire organizations. The LANDFIRE website should be redesigned to meet current user demands.

5. **Establish a coordinated technology transfer program** - Develop a robust technology transfer program fully coordinated with other wildland fire systems that can keep pace with the growing reliance on LANDFIRE products to address evolving agency and partner business needs. The technology transfer methods used by the Fire Learning Network and Fire Modeling Institute should serve as the core of this program.

6. **Plan for and execute an effective organizational transition** - Throughout its history, the LANDFIRE Program has endured a number of organizational transitions that were poorly executed. Transition to operations and maintenance program must be well managed. A permanent agency organization should be fully defined, fully staffed and affiliated with a DOI or FS organization "host" and be operational at the start of the transition.

Detailed Recommendations:

Specific recommendations and proposed actions associated with each principal recommendation were identified by the GME team. These specific recommendations are supported by the findings presented in Section 3 of the report. These include:

1. Vision and Scope:

   a. Proposed action: Development of a program strategy can benefit from a well orchestrated conversation or "LANDFIRE futures forum" involving existing and potential stakeholders. This forum could be conducted by the universities of Idaho and Montana in cooperation with The Nature Conservancy and should serve as a basis for defining the program's vision and scope. This effort must be accomplished within the next 3 - 6 months to allow the integration of production changes into the current schedule of updates.

b. Proposed action: Investigate how to assist the FGDC vegetation subcommittee's efforts to adopt the National Vegetation Classification Standard necessary to support development of existing vegetation data products by LANDFIRE at multiple levels (scales) within the NVCS hierarchy.

2. Organization and Governance:

a. Proposed action: Do not engage in organizational design and evaluation without first understanding the vision and scope of the future program. Vision and scope will emanate from the agency executives and be detailed as goals in a strategic plan.

b. Proposed action: The vision and resulting strategy should be adopted by the Wildland Fire Leadership Council. The implementation plan and organizational charters that support the vision and strategy should be defined by agencies and partners involved in the Executive Oversight Committee.

c. Proposed action: Conduct a formal evaluation of the options available for housing and maintaining the LANDFIRE maintenance functions before moving forward on the proposal to use EROS/USGS as the single organizational "host" for the LANDFIRE program. This evaluation should consider the candidate organization's capability to support LANDFIRE operations and maintenance with subject matter experts and the ability to maintain connections to primary users.

d. Proposed action: A permanent LANDFIRE Program staff must include the following positions and organizational functions:

- **Project leadership** – Permanent agency leader(s) with direct program oversight, accountability, and leadership authority.

- **Program support** - Project management, communications and marketing, administrative and business support, and IT system compliance

- **Innovation and improvement** - Production method improvement, incorporation of emerging research and science, and linkages to existing and new applications

- **Production and deployment** - Updates to LANDFIRE National data products, data distribution and delivery, and data stewardship, including QA/QC procedures

- **Technology transfer** – Training, user support and helpdesk, coordination with other applications/tools and identification of user needs

- **Technical development** - Refinement and testing of production methods and recommended production updates and sequencing, and change management proposals

e. Proposed action: Take advantage of the transition of wildland fire management applications from development to operation and maintenance to provide common support services to wildland fire management applications and programs. These opportunities include: business

and administrative support; communications, including website support; technology transfer and user support; coordinated innovation and improvement, including a research and development program; and project management services, including compliance with information management procedures and requirements.

f. Proposed action: Future organization of the LANDFIRE Program should consider the use of best practices employed by other successful national programs (e.g., Forest Inventory and Analysis) to maintain connections with users and explore program enhancements.

g. Proposed action: A national technical advisory team needs to be established to provide a mechanism for proposing solutions to highly technical national data and application issues.

h. Proposed action: Establish technical leads at each Geographic Area Coordinating Center to provide consistent technical leadership, data stewardship, and expert advice to users.

3. **Data quality and integrity:**

a. Proposed action: LANDFIRE Program managers must be staunch advocates for data quality and integrity. Allegiance to these principles should govern day-to-day as well as strategic program decision making.

b. Proposed action: Updates must be triggered by landscape-level disturbance information in addition to routine data update schedules. These "triggers" may require a sensitivity analysis be conducted by primary LANDFIRE data users (e.g., FPA) to identify the level of disturbance that affects the outcomes of primary downstream users. Abandon decadal re-mapping efforts in favor of dynamic and continuous updates.

c. Proposed action: Consider the use of the Fire Research and Management Exchange System (FRAMES) as the common repository for all GACC data layers used in wildland fire decision support systems and as a source for LANDFIRE updates.

d. Proposed action: Linkages between wildland fire decision support systems and operational data must be established to reduce cumbersome manual processing methods to account for landscape disturbance.   Principal system integration connections include:

    -   NFPORS – fuel reduction and other vegetation treatments

    -   WFDSS – wildland fire management operations

    -   MTBS – burn perimeter and severity for large wildland fire events

    -   Annual Forest Health Protection insect and disease mapping

    -   Urbanization and land conversion information developed by FIA and/or NRCS.

e. Proposed action: Investigate use of the Joint Fire Sciences Research Program for providing coordinated research and development associated with production methods and their synchronization with wildland fire decision support systems.

f. Proposed action: Establish change management procedures, including executive approval processes, within the context of other wildland fire decision support systems.

g. Proposed action: National land cover data, including dominant existing vegetation and structure, should be incorporated into the suite of LANDFIRE data products.

h. Proposed action: Acquire NRCS soil survey data for use in describing and improving accuracy of biophysical settings associated with grasslands and shrublands.

i. Proposed action: Improve plot data in image classification and accuracy assessment. Consider the following:

    -   Extension of Forest Inventory and Analysis plots to all lands in all states, and

    -   Implementation of the BLM proposal to develop better plot information for shrub and grasslands

4. **Communication**

    a. Proposed action: Develop an effective and well-designed communication program that emphasizes a two-way communication with agency leaders and users of the data products.

    b. Proposed action: Agency administrators and incident commanders should be provided an overview of the LANDFIRE Program, its products, and uses during annual training or through their networks.

    c. Proposed action: Describe improvements in the support of wildland fire management decision making and other natural resource decision making as a result of using LANDFIRE data products and make these success stories available to potential users.

    d. Proposed action: Redesign the LANDFIRE website with the assistance of professional website designers. Evaluate alternative designs and requirements with a cross section of users.

    e. Proposed action: Access to LANDFIRE National data products via the website needs to be streamlined and re-designed to better support this function. Data alerts and technical guidance regarding LANDFIRE data products should be embedded in metadata associated with data downloads.

    f. Proposed action: LANDFIRE should provide data reports and summaries for states, GACC areas, and other major geographic areas determined by the Executive Oversight Group.

5. **Technology Transfer:**

    a. Proposed action: Technology transfer support to multiple wildland fire applications should be organized under a common and coordinated structure. The methodologies used by the Fire Learning Network and Fire Modeling Institute should serve as the core of this program.

    b. Proposed action: User forums should be created within the Fire Research and Management Exchange System (FRAMES) and user group meetings (organized by GACC or similar units) held

to provide a venue for discussion of program status, user needs, profile examples of proper application, and innovative approaches using LANDFIRE data.

    c. <u>Proposed action</u>: Technology transfer should emphasize: training for GIS analysts and others using GIS tools to ensure data are applied appropriately and efficiently to support agency business needs, and appropriate use of LANDFIRE data products with attention to scale and data resolution.

    d. <u>Proposed action</u>: Describe the utility of the LANDFIRE National data products to support land and resource management planning business requirements.

    e. <u>Proposed action</u>: Develop information and crosswalks between LANDFIRE National data products and data products with higher thematic and spatial resolution typically used to meet project planning and assessment business requirements.

6. **Organizational Transition:**

    a. <u>Proposed action</u>: Define and approve the LANDFIRE Program organization and ensure key positions are fully staffed and operational at the beginning of the transition.

    b. <u>Proposed action</u>: Ensure program funding and budgeting agreements and procedures are complete and well documented.

Conclusion

LANDFIRE is beginning to realize its vast potential as the first and only consistent national all-lands data set available for addressing landscape-level disturbances. The success of the LANDFIRE Project and foundation created for working cooperatively across multiple organizations is an investment that must be leveraged to address a broader range of issues facing the Department of the Interior agencies, USDA-Forest Service, and The Nature Conservancy.

The window of opportunity to initiate implementation of the recommendations described in the GME report is limited and should be addressed within the next 3-6 months to take advantage of opportunities for expanded program support and most importantly establish an organization structure to ensure the future success of the LANDFIRE program.