

Proposed Fuels Treatment Spatial Data Standards

A White Paper

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Introduction

A common template is needed for geospatial data to facilitate sharing data between agencies. This white paper introduces two GIS Data Layer Standards for use with hazardous fuels reduction efforts. The standards were developed by an interagency group in the Rocky Mountain area in collaboration with several states and with a similar group in the Pacific Northwest. There is also a requirement to have a standard data format for geospatial data being loaded into the National Fire Plan Operations and Reporting System (NFPORS) database.

Abstract

This paper will explore why the standards were developed and their intended use. The logic behind the standard development is included.

Problem Statement

Many agencies collect geospatial data of hazardous fuels reduction projects and treatments. Due to the lack of standards for these data, it is difficult for these data to be shared between the various federal and state agencies. Differences in the spatial resolution of the data and the attributes associated with the data make it difficult to coordinate treatment areas across agencies and between local units within the same agency.

Standardized geospatial fuels treatment data can be collected and joined together for use in other existing or proposed national programs. This could include updating LANDFIRE information, use in Fire Program Analysis (FPA), Fire Spread Probability (FSPro) and Wildland Fire Decision Support System Project (WFDSS) to name a few.

Additionally, there are plans for NFPORS to collect and store polygon data for fuels treatments. Having an existing standard will facilitate automated loading of the database and should save significant time and money. A geodatabase template that adheres to these standards is being developed and will be distributed to make it easier for units to ensure that their data meets the standard and can be easily loaded into NFPORS and/or shared with other groups.

Proposed Solution

Introduction of Solution

The Fuels Treatment Standards were developed to work for all the federal agencies and for the states. The Fuels Treatment Standards Group consisted of Rocky Mountain area and National level wildland fire geospatial specialists from the National Park Service, Bureau of Land Management, US Fish and Wildlife Service, US Geological Survey (including employees working closely with NFPORS development), US Forest Service and Colorado State Forest Service. Subject matter experts from the Bureau of Indian Affairs, Arizona State Forest Service, Pacific Northwest Geographic Area, and US Forest Service Forest Activities Tracking System (FACTS) were consulted at various times throughout the process.

Both the Fuels Treatment (polygon) standard and the Fuels Project Area (polygon) standard have a target map scale of 1:24,000 in the conus (continental U.S.) and 1:63,360 in Alaska. This is a commonly accepted scale and adequate for the data set. The data standards will accommodate data of varying scales.

Both standards allow for any horizontal coordinate system and datum to be used, but it must be clearly defined with all necessary parameters. This allows local units to collect the data in the horizontal coordinate system and datum they normally use. Utilities will exist within NFPORS to import the data, as long as the coordinate system/datum is defined. The polygons can be represented in shapefiles, geodatabases, or ArcInfo coverage models.

The attributes or fields, defined in the standards in “Section 3: Business Data Specifications” of the standard template, list attributes or fields which must be attached to the data. The fields must be attached in the specified order defined in the standard. Where the standard states that an item or field (or attribute) is required, it means that the field must have a value and not be null.

Attributes (or fields) were chosen for inclusion in the standards based on three simple principles. The standard must allow the spatial data to be connected with the NFPORS database while also allowing the spatial data to be connected to various local or agency specific databases (e.g. U.S. Forest Service’s FACTS or WEBDET). It is important that the spatial data contain enough information to stand on its own, without connecting to a database. In the Fuels Treatment standard, the TRT_ID field provides the link to NFPORS, while the TRT_LOCAL_ID contains the link to local or agency specific databases. In the Fuels Project Area standard, the PROJ_ID links to NFPORS, while the PROJ_LOCAL_ID provides for the link to other databases. The other fields in both standards provide for information to make the data useful without connecting to outside databases. The fields providing information about the spatial data collection, COL_METHOD and COL_DATE can also be used when uploading the data to NFPORS.

Application of Solution

The wildland fire community has acknowledged that to fully realize the capability and benefits of geographic information and GIS technology, spatial data needs to be shared and systems need to be interoperable. The creation of these data standards will:

- ◆ Increase interoperability among geospatial technologies
- ◆ Increase the reliability and effectiveness of the GIS products produced
- ◆ Facilitate data sharing
- ◆ Contribute to making life simpler

As identified in the *NWCG IRM Strategy Project: Wildland Fire Business Model (1996)*, also known as the NWCG IRM Strategy Report, there is no process to facilitate coordination between projects and existing systems to establish and implement shareable data standards. There is no mechanism in which a person or organization can request a modification to existing data definitions and terms, therefore resulting in yet another definition. To resolve this and other issues the National Wildfire Coordinating Group has formally chartered and established the Data Administration Working Group (DAWG) to address standards issues. To date the DAWG has approved the following data standards:

- Daily Fire Perimeter Data Layer Standard
- Fire History Data Layer Standard

The GIS Standard Operating Procedures on Incidents Project (GSTOP) developed and recommended GIS SOPs guidelines for incidents to the NWCG. As a minimum this included:

- Naming conventions and structure (e.g. Folder and file)
- Standard map product definition
- Minimum Essential Data Sets
- Data sharing and archiving procedures
- Incident team transition procedures
- Minimum GIS expectations on an incident
- GIS symbology identified
- Documentation and metadata procedures

Having these (GIS SOP) standards in place will:

- ◆ Provide people with all the safety, health, environmental and operational information necessary to perform a job properly

- ◆ Ensure that production operations are performed consistently to maintain quality control of processes and products
- ◆ Ensure that processes continue uninterrupted and are completed on a prescribed schedule
- ◆ Serve as a training document for teaching users about the process for which the SOP was written
- ◆ Serve as an historical record of the how, why and when steps in an existing process so there is a factual basis (not hearsay) for revising those steps when a process or when technology changes.

With the acceptance of the need for data standards and the creation of the DAWG the development of the fuel treatment standards is in line with Wildland Fire Management policies. Acceptance and adherence to the previously listed standards has improved collaboration and it is expected that the fuel treatment standards will do the same.

Future Direction

In the future, all agencies will collect and store their fuels treatment polygon and fuels treatment project area polygon data following these standards, enabling spatial data to be easily shared and exchanged between agencies. At some future time, all agencies may be able to share the data using a single geodatabase.

In addition, the fuels treatment polygons and project area polygons will be easily uploaded into NFPORS. It will be simple to connect the fuels spatial data to the large amount of tabular data stored in NFPORS and in other spatial and non-spatial databases. Applications can be developed to leverage these data for further information sharing and integration with other applications and efforts such as LANDFIRE, WFDSS, FSPRO and FPA.

A template geodatabase is being developed for local units to populate with their data. The geodatabase will assist in maintaining the standards. A data dictionary following these standards is also in development. It will be used with Trimble GPS units.

In the future, there may be a need to develop similar standards for fuels treatments stored as lines or as points, since the U.S. Forest Service's FACTS database system allows for fuels treatments to be stored as lines and points.

Conclusion

We recommend that these standards be adopted by the NWCG for the wildland fire community. These standards enhance collaboration and data sharing between federal and other agencies.

Appendices

Appendix A – Authors

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Appendix B – References

See proposed standards. References are detailed in the standards.