| **GeoTASC Project Plan** | March 12, 2018 |
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# Development of a Batch Update Workflow for NHD

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## **Overview**

As the U.S. Forest Service (USFS) continues to collect lidar data for Forests across the country, there is increasing availability of high resolution (1-meter) digital elevation models (DEM). A common application of DEMs is the creation of hydrography data that captures the location and extent of rivers, streams, lakes and ponds. The National Hydrography Dataset (NHD) is the most comprehensive collection of hydrography data in the United States, and it is utilized by scientists and government agencies in numerous capacities. Hydrography data created from high resolution DEMs are more accurate than current data available through the NHD, which are primarily created from the original 1:24,000 scale topographic maps.

To integrate the more accurate, lidar-derived hydrography data into the NHD, the U.S. Geological Survey (USGS) works with state, federal and local agencies through a stewardship program that enables qualified individuals to conflate new data with the NHD. The primary tool used to update the NHD with large amounts of data is the USGS GeoConflation tool, for which users need training in order to gain access. USFS Region 5 cooperators currently see the process of bulk updating the NHD with lidar derived flowlines as a difficult, unintuitive process. To facilitate the incorporation of lidar-derived flowlines into the NHD, Region 5 cooperators desire a workflow that will enable them to improve the efficiency of updating the NHD with large amounts of data (multiple HUC12s).

## **Scope**

This objective of this project is to find ways to improve the efficiency of preparing hydrography flowlines for the USGS GeoConflation Tool. In order to be ingested into the GeoConflation tool, flowlines need to have specific attribute information, including proper classifications and flow direction, and pre-conflation QA/QC checks that ensure NHD model standards. Stewards and hydrography experts from the USGS and USFS will be consulted throughout the project to identify key areas where improvements to the pre-conflation process can be made and where methods can be streamlined. Initial discussions with key experts indicate that this pre-conflation process is where most confusion and difficulties emanate from.

## **Pilot Study Area**

Lidar data that was collected in 2013 for the Moonlight Fire area will provide a pilot study area to test the workflow when necessary. The Moonlight Fire burned over 65,000 acres on the Plumas National Forest in northern California (figure 1) in September, 2007. This burned area is the focus of a restoration strategy that is aimed at restoring and promoting healthy and resilient ecosystems.



Figure : Moonlight Fire Location Map (Credit: Moonlight Fire Restoration Strategy, USDA Forest Service).

## **Project Components**

The project will proceed as outlined below.

### Phase 1 – Project Planning

Review project proposal and hold kick-off meeting with proposer and potential cooperators. Put together project plan and get approval from all team members.

### Phase 2 – Literature Review and Consultation

Review literature on current methods for preprocessing data for the USGS GeoConflation tool. Consult with experts from the USFS and USGS to learn more about best practices for using the GeoConflation tool, preprocessing data for it, and potential improvements that can be made to preprocessing steps.

### Phase 3 – Develop/Refine Workflow

After consulting with NHD experts in the USFS and USGS, we will identify the most efficient workflow for preparing data for the GeoConflation tool and then create instructional material (such as step-by-step exercises) that document the necessary steps. The target audience will be analysts that are interested in providing batch updates to the NHD.

### Phase 4 – Technology Transfer

Techniques and methods will be shared with cooperators and other key personnel via webinar and technical consultation via email and phone.

### Phase 5 – Project Report and Closeout

The results of this project will be captured in a Tip report that highlights the outcomes and workflow developed for this project. Once the Tip report is finalized, a closeout meeting will be held with all cooperators to formally end the project.

## **Deliverables**

1. Tip Report
2. Moonlight Fire flowlines preprocessed for GeoConflation tool
3. Step-by-step instructions outlining necessary preprocessing steps for GeoConflation tool

## **Risk Management Plan**

The following risks could potentially affect the ability to complete this project as outlined:

* One of the risks is the time commitment for both the USGS and GTAC to engage in training that is required to gain access to and use the GeoConflation Tool. The timing of the potential webinar training and the availability of NHD stewardship/GeoConflation experts may impact the estimated completion date of Phase 2. The risk of this happening is moderate and the impact on the overall effort is low. If the presentations and meetings with the USGS are delayed, phase 2 may be completed at a later date. To mitigate this potential risk, the estimated completion date for Phase 3 is set to 7/1/2018, which gives ample time for completion, especially considering that the phase should take about 6.5 weeks.
* Another potential risk is that bulk updating attribute information and the QA/QC processes that are necessary for data ingestion to the GeoConflation Tool may be somewhat manual processes that may not be suitable for an efficient bulk processing/update workflow. The likelihood of this occurring is moderate and the impact on the project will be moderate. If this risk is realized, then the manual process will need to be detailed in such a way that the workflow is clearly communicated and more transparent for stewards and NHD users in general.

## **Project Funding and Schedule**

This project is funded for 11 weeks of RedCastle staff time. Project activities will begin in January, 2018 and will continue through September, 2018. The project will be completed by October, 2018. Below is a table that lists project activities and their estimated completion dates.

| Schedule of Tasks | Primary Lead | Estimated Duration (Weeks) | Estimated Completion Date | Comments |
| --- | --- | --- | --- | --- |
| Phase 1: Project Planning | All | 0.5 | 2/15/2018 |  |
| Phase 2: Literature Review and Consultation | GTAC & Cooperators | 1.5 | 3/15/2018 |  |
| Phase 3: Develop and Refine Workflow | GTAC | 6.5 | 7/1/2018 |  |
| Phase 4: Technology Transfer | GTAC & Cooperators | 0.5 | 8/1/2018 |  |
| Phase 5: Project Report and Closeout | GTAC | 2.0 | 10/1/2018 |  |
| Total GTAC Staff Time: |  | 11.0 |  |  |

\* Time estimates for cooperators and is not included as “Total GTAC time.”

RASCI Matrix: This chart helps to clarify the roles and responsibilities of the project members.

| **Activity** | **Eric Rounds** | **Abbey Schaaf** | **Jess Clark** | **Ralph Martinez** | **Tim Lindemann** | **Greg Matthews** | **Carol Ostergren** | **Ray Postol-ovski** | **Mike Eberle** | **Mike Plivel-ich** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Phase 1: Project Planning | R  | S | A  | C | I |  I | C | I | I | I |
| Phase 2: Literature Review and Consultation | R | S | A | I | C | I | C | C | I | C |
| Phase 3: Develop and Refine Workflow | R | A | I | C | C | I | C | C | I | C |
| Phase 4: Technology Transfer | R | A | S | S | I | I | I | I | C | I |
| Phase 5: Project Report and Closeout | R | S | A | I | I | I | I | I | I | I |

| **R – Responsible**:Who does the work? |
| --- |
| **A – Accountable**: Who approves the work? |
| **S – Support**: Who supports the person doing the work? |
| **C - Consult**:Who provides opinions/input about the work? |
| **I – Informed**: Who needs to be informed about the outcomes from the work? |