1. PROJECT INFORMATION

Title:	Imiq - Hydro/Climate Database: Migration to Open Source Platform and Creation of Map Service Interfaces and Displays
Report period	January 1, 2014 - June 30, 2014
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2. PROJECT OVERVIEW

a. Briefly (4-5 sentences) describe both the research purpose and the underlying need for this research.

The Arctic Landscape Conservation Cooperative (ALCC) commissioned the creation of *Imiq*, a database of historical hydrological and meteorological data from more than 3000 sites across Alaska. Data contained within Imiq facilitates improved design of long-term, hydroclimate monitoring stations and increased understanding of many hydroclimate feedbacks. Imiq was originally implemented in a closed-source database system developed and maintained by the University of Alaska Fairbanks Institute of Northern Engineering. The current, USFWS-funded "Imiq-Hydro/Climate Database" project is migrating the original Imiq database into open-source architecture that aligns with USFWS data management systems. Additionally, an application programming interface (API) and web-based map interface to Imiq is being constructed to provide convenient access to USFWS data users and to the community at-large.

b. List the objective(s) of the project, exactly as described in your Statement of Work.

1. Collect scripts, documentation, tools and later applications built around Imiq. Review storage differences between Microsoft SQL Server & PostgreSQL.
2. Automate loading of Microsoft SQL to PostgreSQL.
3. Create development database and separate development environment for testing. Review and convert stored procedures from Microsoft SQL to PostgreSQL
4. Use development environment to test SSIS connections to PostgreSQL to determine if the tool can be used to manage data loading, and to determine if development of an alternative data loading tool is necessary. Create Imiq project management and repository code.
5. Determine if long-term database plan and role of Microsoft SQL Server and SSIS.

6. Create ActiveRecord compatible object relation mapping interface (ORM) and finalize data model.
7. Create a simple web interface to show stations, including basic visualization, basic query, and download of data
8. Add PostGIS spatial engine to the ORM mix. Integrate visualization tool and expose metadata for included datasets. Extend the Imiq application with advanced query and integration via web application features.
9. Provide an archival copy of the database to Arctic LCC staff as well as provide support and training on application programming interfaces. Final project review with partners. Discuss recommendations for possible continuing development and support.

3. PROGRESS SUMMARY

a. Describe report period progress.

1. Completed during previous reporting period.
2. Completed during previous reporting period.
3. A development database and environment have now been created to complement the production database. This deliverable has now been completed.
4. Completed during previous reporting period.
5. Completed during previous reporting period.
6. The active record ORM is in place, and mapping new database tables to models is straightforward. This deliverable has now been completed.
7. The basic web application was finished during this reporting period. A data download system was created and beta-downloads made available to our collaborators. This deliverable has now been completed.
8. The Imiq Data Portal was significantly expanded from its basic version. Data and metadata download capability has been added for summary data products, and all datastreams in the database are now discoverable via advanced query options (Figure 1). Time series visualizations of basic hydrometeorological and meteorological parameters are now launched from site "pop up" windows (Figure 2). The Imiq Data Portal has been tested for several popular browsers, and has been added to the Arctic LCC web-site (http://arcticlcc.org/projects/imiq/) via IFrame. http://arcticlcc.org/projects/imiq/data-portal/
9. An archival copy of the database has been delivered to ALCC staff, but an update will also be provided. A structure for API docs was put in place.

b. Describe preliminary results.

The online browsing and data API applications have been deployed and are available online for demonstration purposes (http://imiq-map.gina.alaska.edu). Data downloads and accompanying metadata files are available for review.

c. Publications, conference papers, and presentations.

Nothing to report.

d. Education and outreach.

Nothing to report.

e. Other products resulting from the project.

Public web interface at http://imiq-map.gina.alaska.edu
Public API interface to the database at http://imiq-api.gina.alaska.edu
PostgreSQL version of the IMIQ database
Public web interface embedded in ALCC web-site at http://arcticlcc.org/projects/imiq/

f. Describe any concerns you may have about your project's progress.

Nothing to report.

4. PROGRESS STATUS

The Imiq - Hydro/Climate Database project is progressing on schedule. During this reporting period, significant advancement was made on the Imiq Data Portal that brings the Imiq database and map to the community. Specifically, data and metadata download capability has been added, as well as advanced query options and data visualizations. The Imiq Data Portal was added to the Arctic LCC web-site (http://arcticlcc.org/projects/imiq/).

In the July-December 2014 reporting period, work will continue on the Imiq Data Portal and documentation. Additional summary products will be added to the list of downloadable data, user documentation will be improved, metadata formats will be finalized, and suggestions from ALCC partners incorporated. As this project comes to a close, ALCC staff will be provided with the training needed to directly access data from the API and the support necessary to maintain the Imiq Data Portal on the ALCC web-site.

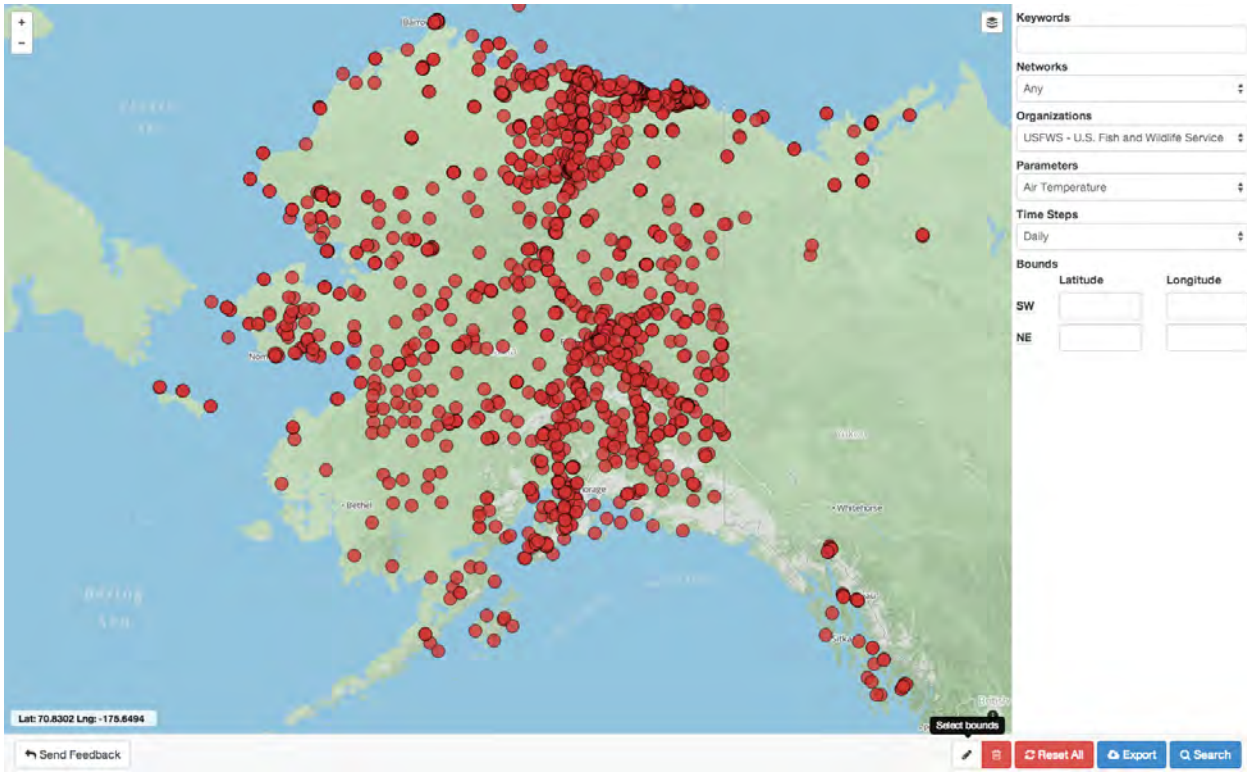

Figure 1. The Imiq Data Portal is now available through the Arctic LCC web-site (http://arcticlcc.org/projects/imiq/data-portal/).

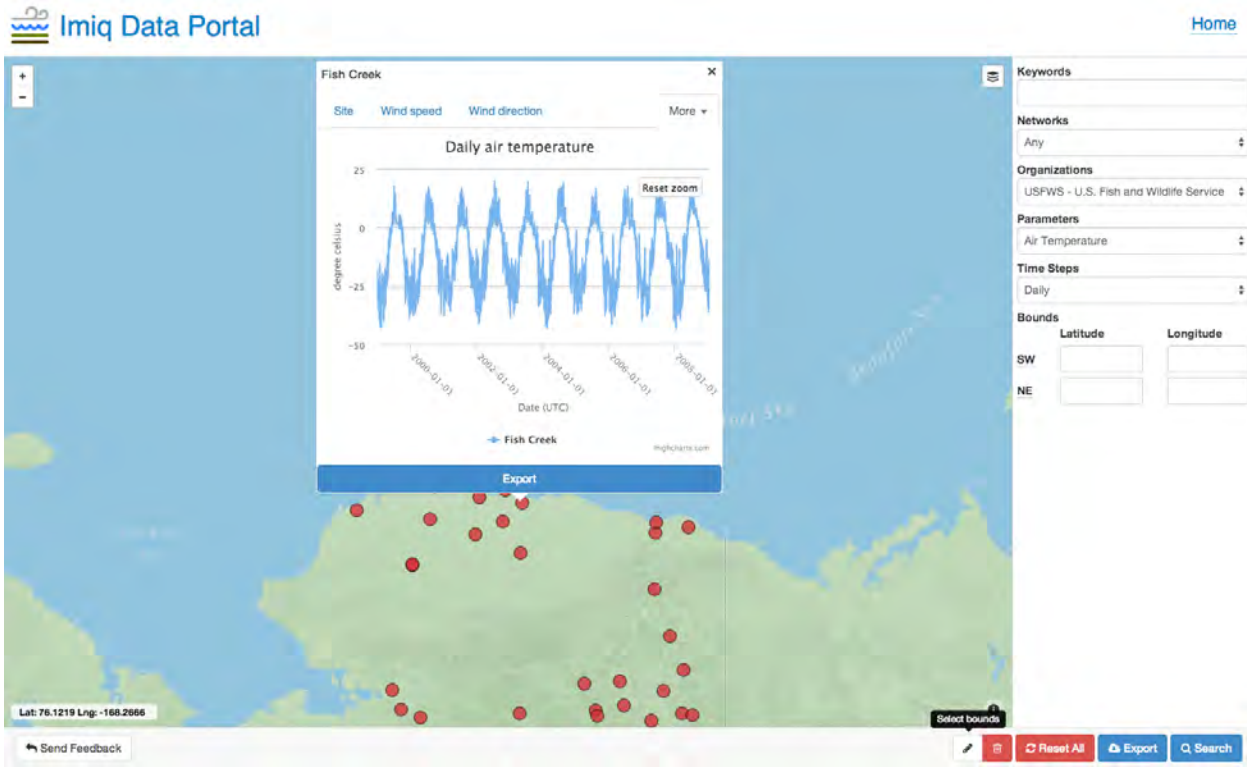

Figure 2. Data exports and visualization tools are available through the site "pop up" bubbles.