GINA Bootcamp

Introduction to Geographic Information Systems

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Overview

- GIS Data Sources
  - Federal
  - State, Borough, City

- Case Study - Alaska Fire Mapping
  - GINA Puffin Feeder
  - GINA Fire Point Processing
  - GINA Fire Color
  - AFS Web Map and Services
  - DOF Web Map

- Guided Tour (Build your own Active Fire Point Map)

Federal Data Sources (just a few...)

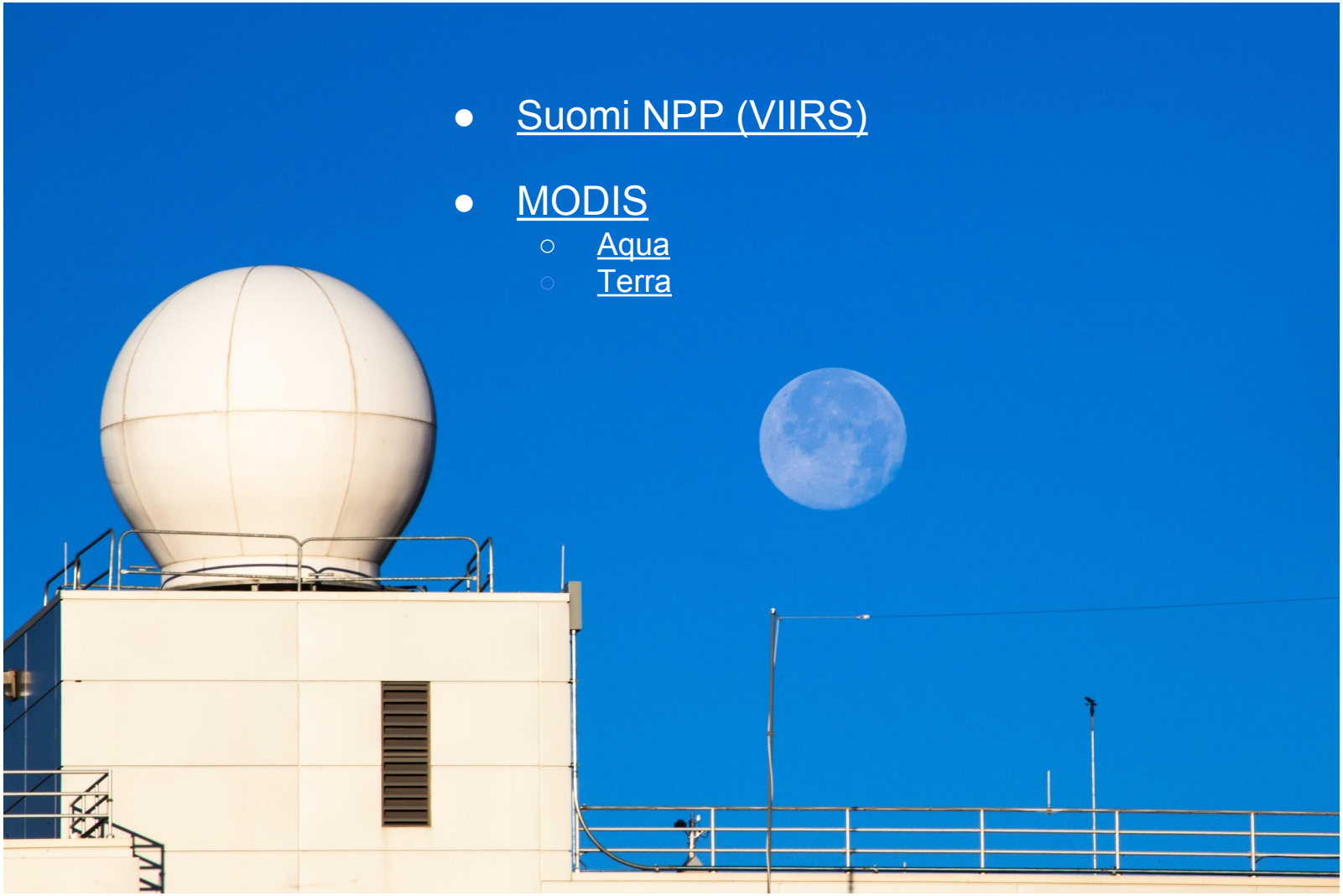
- US DATA.GOV http://www.data.gov
- TNM (USGS) http://nationalmap.gov
- nowCOAST (NOAA) https://nowcoast.noaa.gov
- NGDC (NOAA) https://www.ngdc.noaa.gov
- USFWS http://www.fws.gov/gis
- NRCS http://websoilsurvey.sc.egov.usda.gov
- TIGER (Census) http://www.census.gov/geo/www/tiger
- NLCD (USGS) http://www.mrlc.gov
- AFM (USFS) https://fsapps.nwcg.gov
- SDMS (BLM) http://sdms.ak.blm.gov/sdms
- AFS (BLM) https://fire.ak.blm.gov/incinfo/aklgfire.php
- EarthExplorer (USGS) https://earthexplorer.usgs.gov

Alaska Data Sources

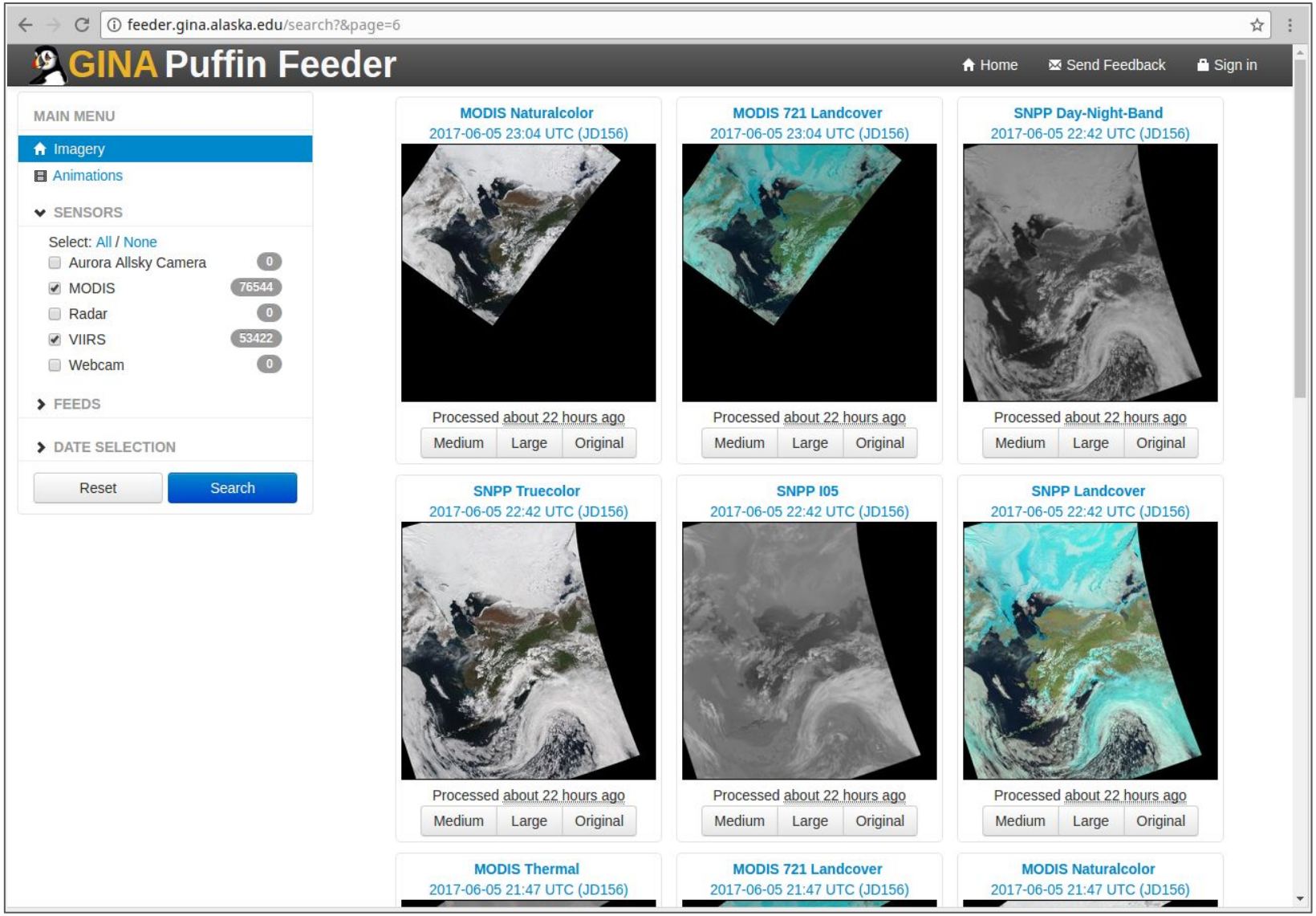
- GINA http://www.gina.alaska.edu
  - GINA PuffinFeeder http://feeder.gina.alaska.edu
  - GINA FireColor http://hippy.gina.alaska.edu/firecolor
- ASGDC (DNR) http://www.asgdc.state.ak.us
- ADOF (DNR) http://forestrymaps.alaska.gov
- ADOT http://www.dot.state.ak.us/stwdplng/mapping
- ADFG https://www.adfg.alaska.gov/sf/SARR/AWC
- FNSB http://gis.co.fairbanks.ak.us
- MOA http://muni.org/Departments/OCPD/GIS2
- KPB http://www.kpb.us/gis-dept
- KIB http://www.kodiakak.us/339/Map-Center
- C&B of Sitka http://www.mainstreetmaps.com/ak/sitka/public.asp
- The list goes on...

Case Study - Alaska Fire Mapping

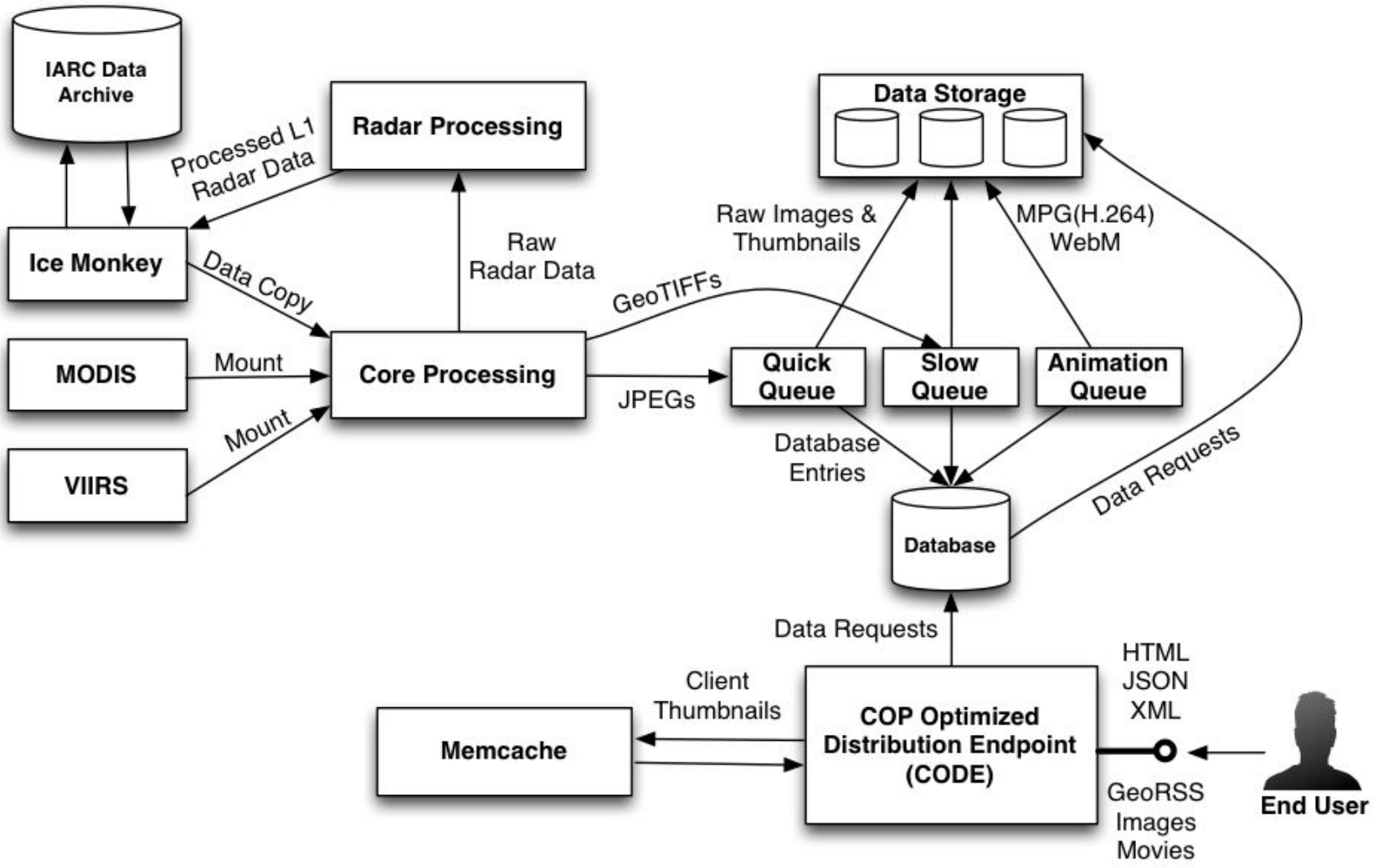
GINA's Satellite Data Receiving Station



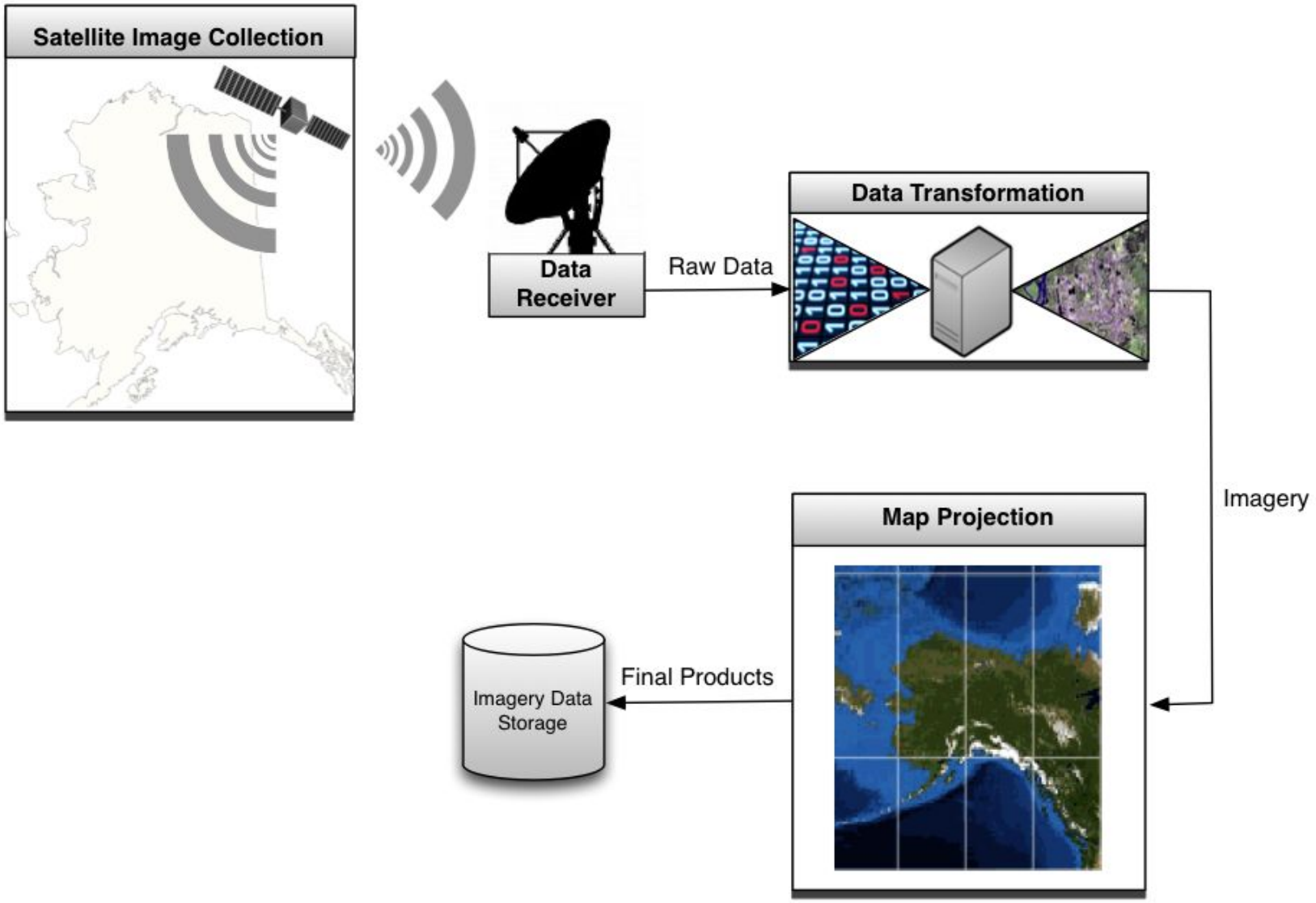
Near Real-time Processing & Distribution



Puffin Feeder Data Flow



High Level Overview of Imagery Data Processing from Satellite Input



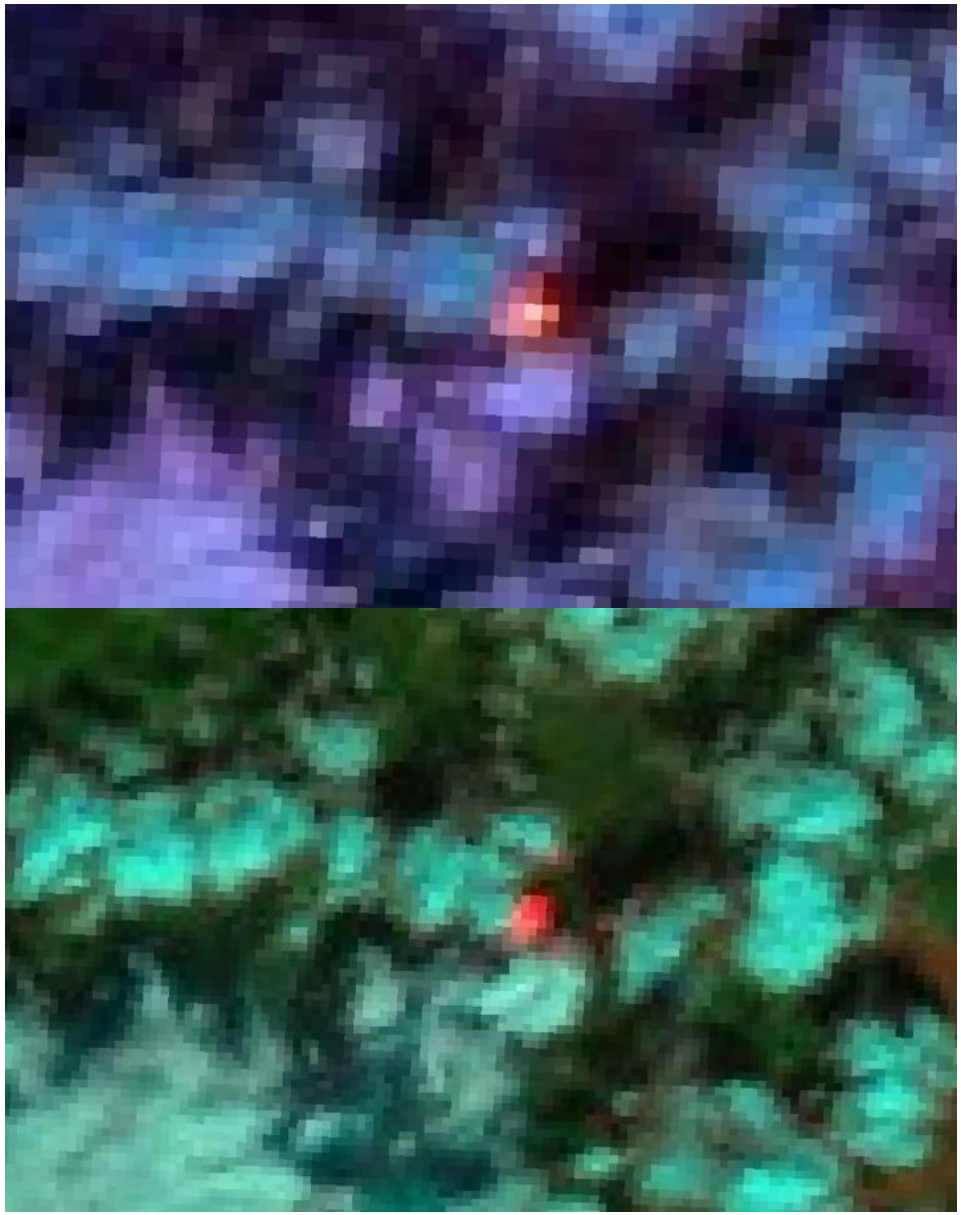
Near Real-time Fire Point Processing

- GINA generates three products used to map wildfire in Alaska
  - VIIRS I-band Fire Heat
    - Processing performed on near real-time stack using NASA IPOPP configured on GINA VM named *popcorn*
    - 375m horizontal pixel resolution provides increased fidelity for rapid detection of smaller fires
    - Less capable of fire characterization due to saturation at higher temperatures (extremely high temperature signatures roll over into cool values)
  - VIIRS M-band Fire Heat
    - Processing performed on near real-time stack using VIIRS Active Fire algorithm, also on *popcorn*
    - 750m horizontal pixel resolution is coarser than I-band, but higher temperatures do not saturate as quickly making it more suitable for large hot fires
  - MODIS Fire Heat
    - Processing performed on near real-time stack using MODIS Mod14 (Terr (Aqua) Active Fire algorithm on GINA VM named *firepoints*
    - Each active fire location represents the center of a 1 km pixel that is flagg algorithm as containing a fire within the pixel http://modis-fire.umd.edu/pages/ActiveFire.php?target=MOD14MYD14

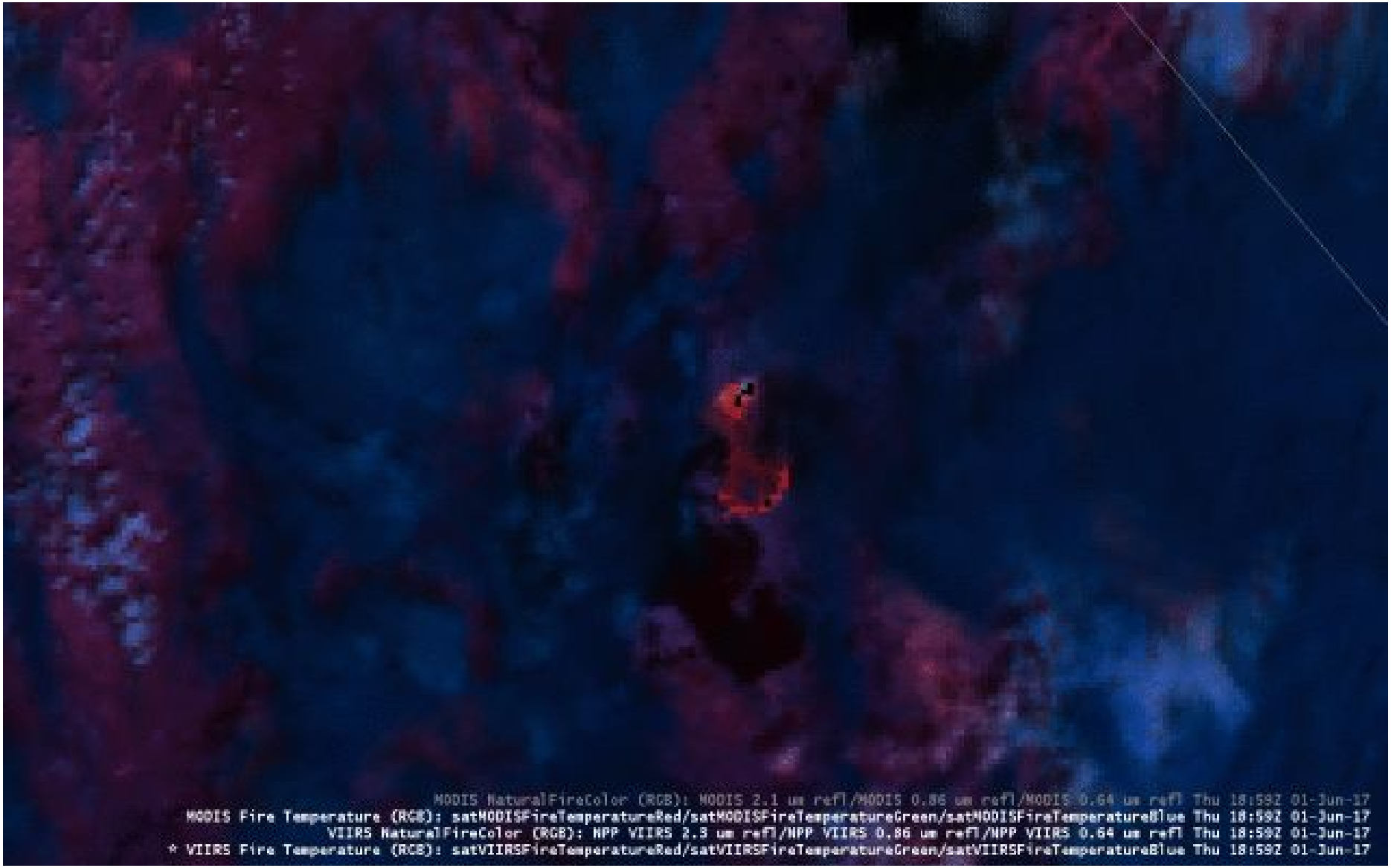
VIIRS M-band vs I-band

M-band

I-band



Animation of MODIS followed by VIIRS a couple hrs later - generated by GINA's Carl Dierking. Fire near Clark Lake, Alberta Canada appears to be getting hotter on north perimeter.



GINA provides to USFS Active Fire Mapping

USDA FOREST SERVICE REMOTE SENSING APPLICATIONS CENTER

Fire Data in Google Earth

- Current Large Incidents (Home)
- New Large Incidents
- Fire Detection Maps
- MODIS Satellite Imagery
- VIIRS Satellite Imagery
- Fire Detection GIS Data
- Fire Data in Google Earth
- Fire Data Web Services
- Latest Detected Fire Activity
- Other MODIS Products
- Frequently Asked Questions
- About Active Fire Maps

RSAC

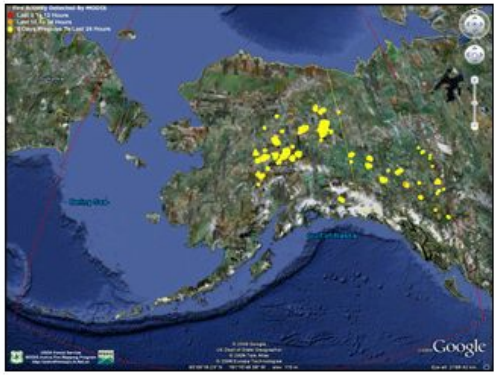
Remote Sensing Applications Center

2222 West 2300 South
Salt Lake City, UT
84119 - 2020

voice: (801) 975-3737
fax: (801) 975-3478

MODIS | VIIRS | LANDSAT | AVHRR | GOES

Alaska



KML

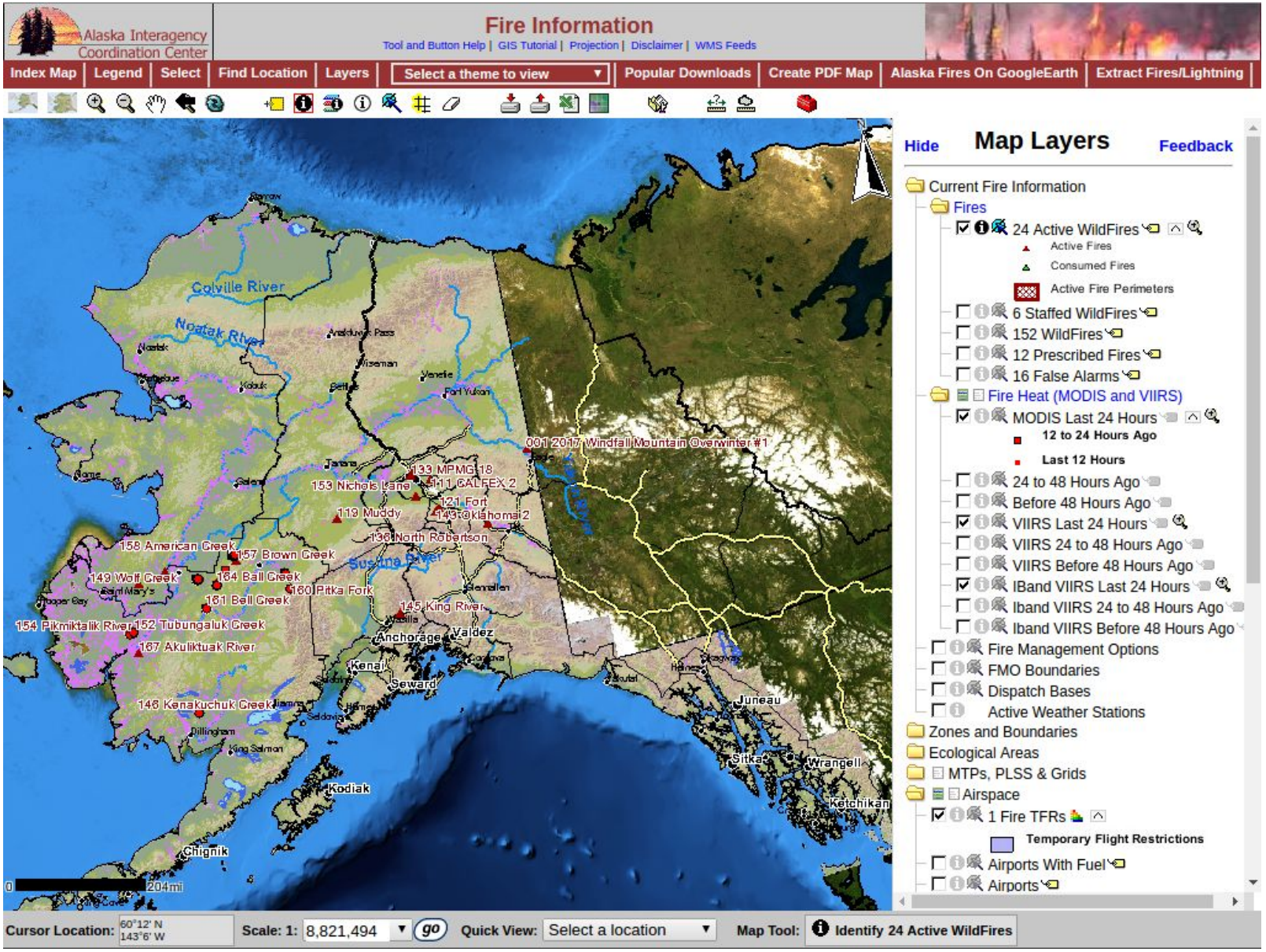
Fire Detections (MODIS): Current | Animation | Historical
Fire Radiative Power (MODIS): Current | Animation | Historical
Large Incidents: Current | Historical
Fire Weather: Current
AFM KML Bundle: Current

KML Access:
The links below provide access to several geospatial datasets relevant to fire management in Keyhole Markup Language (KML/KMZ) format for use in Google Earth and other virtual globe applications. Geospatial data are organized by specified geographic region and include location and characterization of satellite fire detections, current large incident locations and NWS fire weather forecasts.

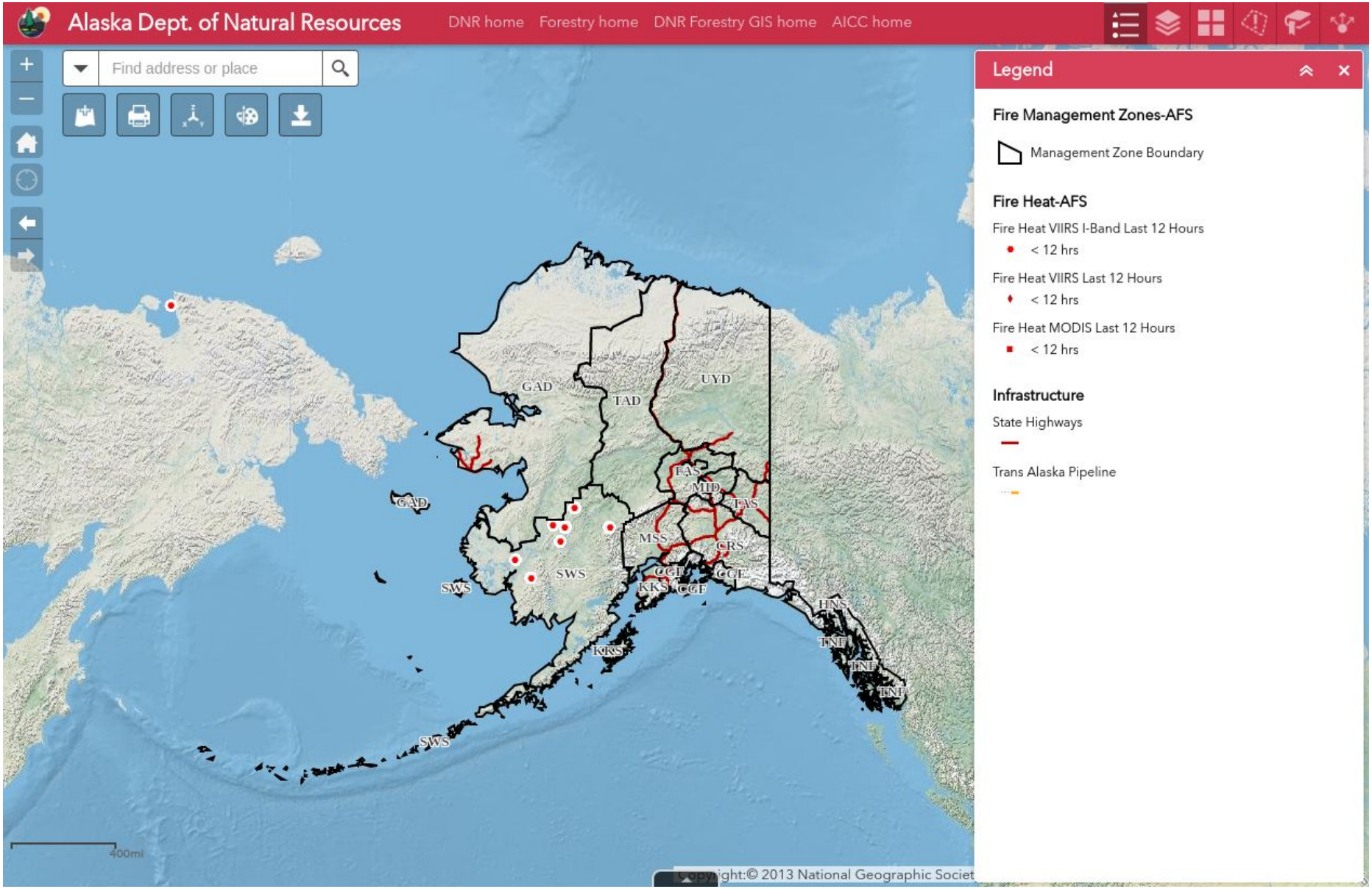
All KMLs update automatically to ensure availability of the latest information (Current link). Animatated time series KMLs are provided for the latest updates of each of the fire detection data layers (Animation link). Access to KMLs for previous dates are provided for relevant data layers (Historic link).

KML Descriptions:
Fire Detections - MODIS (1km), VIIRS (375m and 750m), Landsat 8 (30m), AVHRR (1km) and GOES (4km) fire detections by time/date of occurrence within the last 6, 12 and 24 hours, and the 6 days previous to the last 24-hour period.

GINA provides to BLM Alaska Fire Service



Fire Heat used by ADNR Div of Forestry



Guided Tour “Build you own Active Fire Point Map”

- Become familiar with and use data accessed via web service endpoints
- Become familiar with and use data acquired from online resources
- Generate a well-organized GIS data directory structure
- Compose an ArcGIS ArcMap Map Document
- Symbolize layers in ArcMap
- Label map features
- Create a Map Layout using ArcGIS

Link to this slide dec

https://goo.gl/Gssrxb

http://forestrymaps.alaska.gov/AK_DOF_Fire_App/

http://feeder.gina.alaska.edu

http://feeder.gina.alaska.edu/npp-gina-alaska-true color-images/2017_06_06_20_42_jd157

http://hippy.gina.alaska.edu/firecolor

https://fire.ak.blm.gov/arcgis