Dewberry

GIS for Alaska's Food Systems

From Task Force To Hub Site and Beyond

November 15th, 2022 Alaska Geospatial Council GIS Day Celebration

Administrative Order 331 – Feb 10th, 2022

- **~95%** of the food Alaskans purchase is imported, costing roughly $2 Billion annually.
  - Enormous wealth transfer from Alaskans to outside entities.
  - Alaskans are at risk from any disruption to supply chain.

- **Goal:** Increase local production, harvest, processing, storage, and use of food products.

Administrative Order 334 – April 25th, 2022

- Established “Food Security & Independence Task Force”
- **Goal:** increase food security, strengthen local economies, and lessen Alaska’s dependence on external foods and supply chains.
- Outlined voting membership and administrative support.

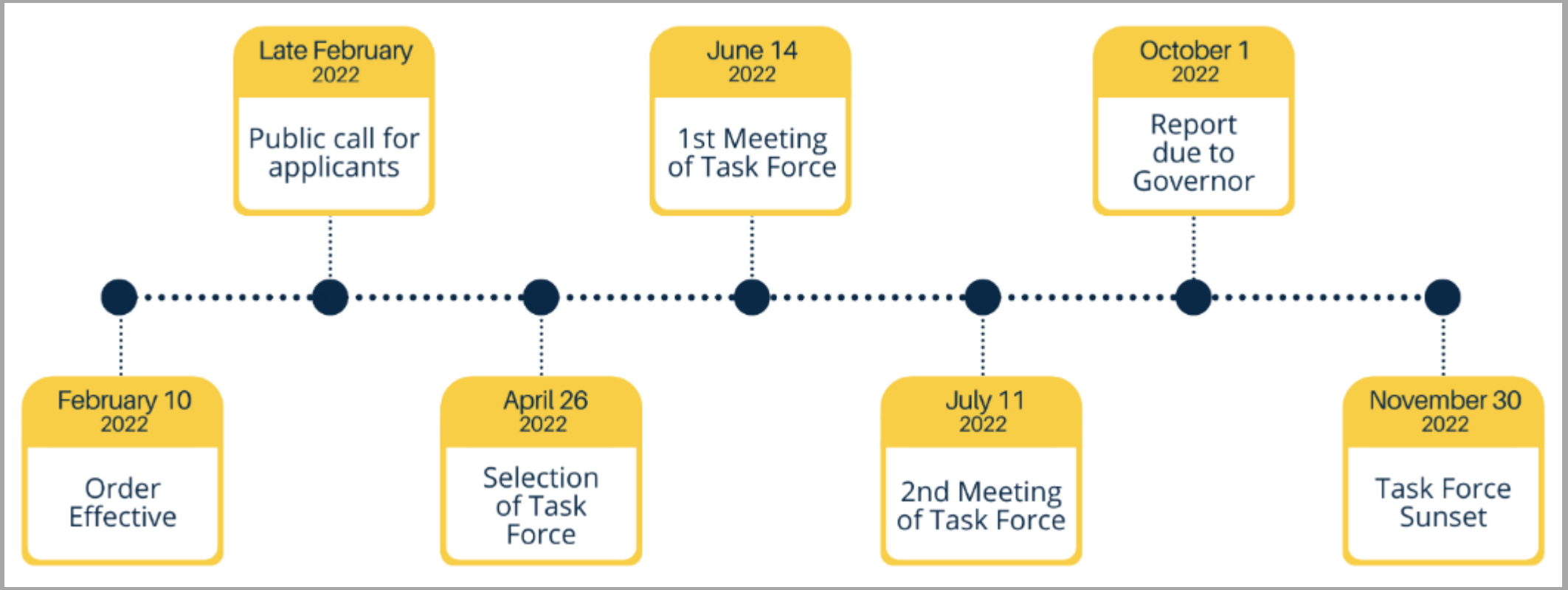
Administrative Order 334 – Summary

- Increase the procurement and use of Alaska-sourced foods.
- Identify barriers that farmers, stock growers, fishermen, mariculture professionals, and others engaged in the growing, harvesting, or raising of food face when starting a business or getting their products in to the Alaska market.
- Assess the levels of wild game and fish harvests in Alaska.
- Recommend a program to assist communities impacted by fishery shortfalls and disasters.

Administrative Order 334 – Summary cont.

- Identify factors that might prevent locally harvested & produced foods from being purchased by federal, state, and local agencies, institutions, and schools.
- Identify research needed to support increased consumption & production of Alaskan foods.
- Engage with the public to seek additional input.
- Assess the need for disaster food caches within the State.
- Provide a report including what administrative & statutory changes would be needed to accomplish the recommendations of the Task Force.

Task Force Timeline



Authoring the Task Force Report

- Task Lead: University of Alaska Fairbanks, Institute of Agriculture, Natural Resources and Extension
  - Project Manager: Jodie Anderson

- Authors: Alaska Food Policy Council
  - ★Robbi Mixon
  - ★Rachael Miller
  - ★Sundance Visser
  - ★Evie Witten
  - ★Melissa Heuer
  - ★Glenna Gannon
  - ★Kyra Wagner

We Need an Interactive Version of the Report

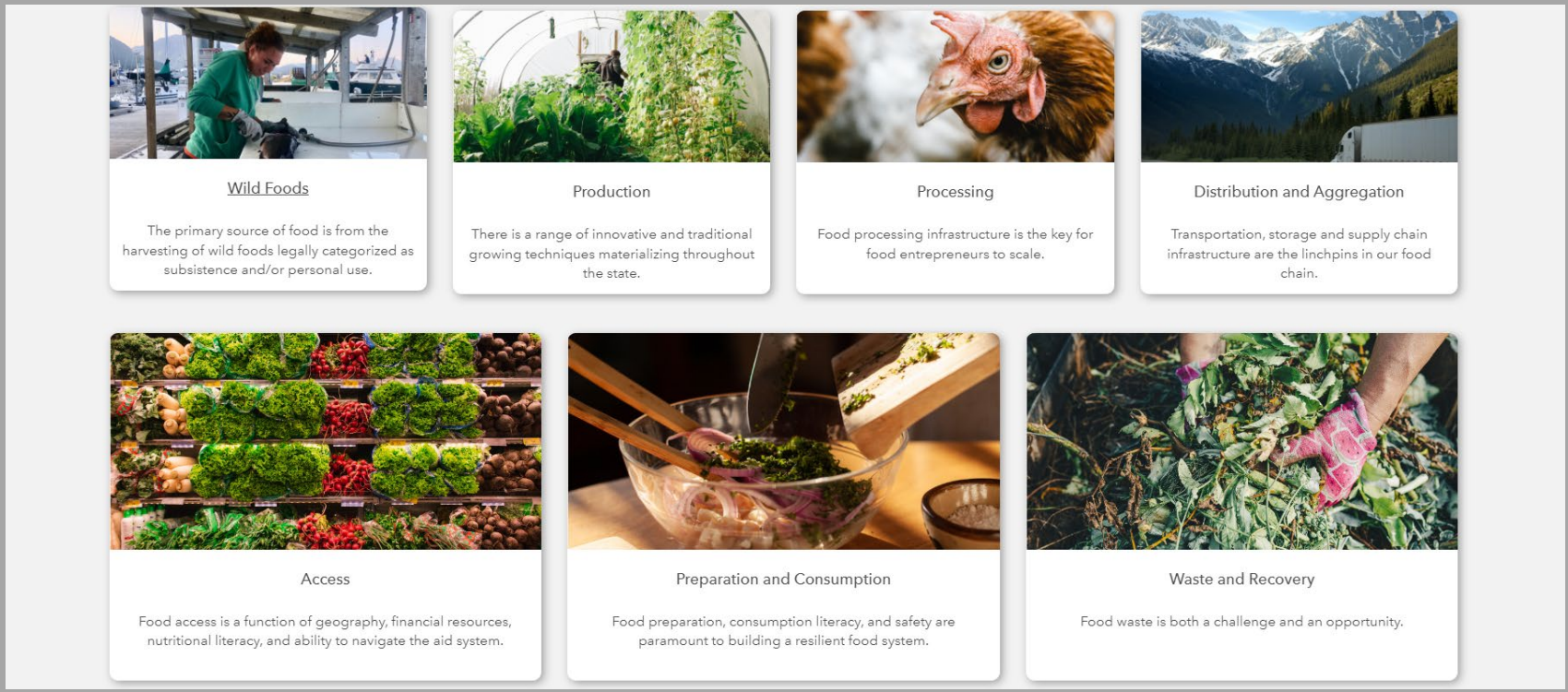
… How about an ArcGIS Hub Site hosted by the AGC?!

https://www.alaskafoodsystems.com/

Built by Amber Chambers, Senior GIS Analyst for Dewberry Alaska

Food System Sectors

- Wild Foods
- Production
- Processing
- Distribution & Aggregation
- Access
- Preparation & Consumption
- Waste & Recovery



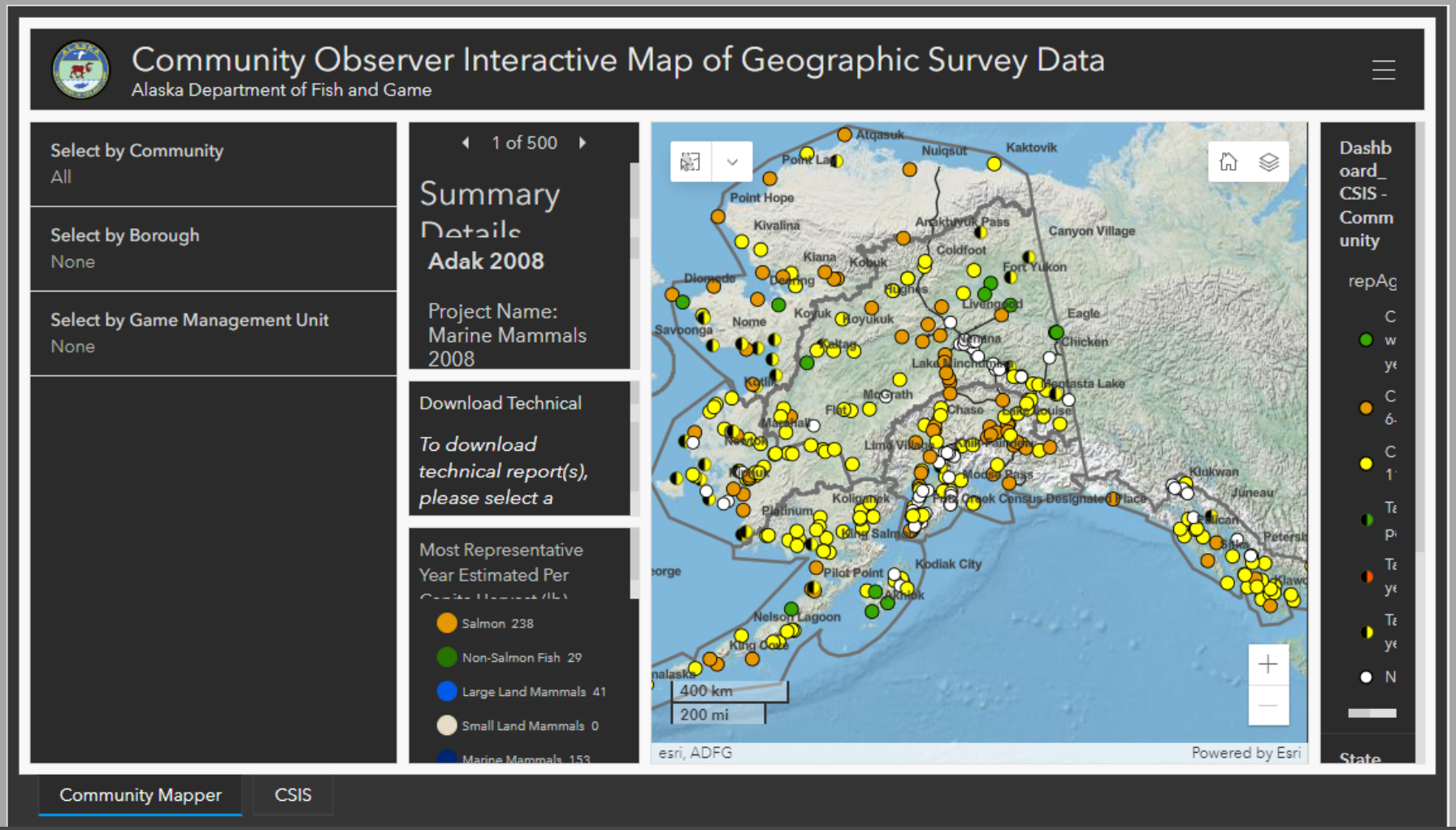
Directives

- Institutional Procurement of Locally Harvested & Produced Foods
- Producer Barriers to Launching, Scaling, and Accessing Markets
- Wild Foods and Increasing Abundance
- Fishery Shortfalls and Disaster Response
- Preparing for Disaster: Food Caches
- Alaska Food System Research Needs

SWOC Interactive Experience Builder

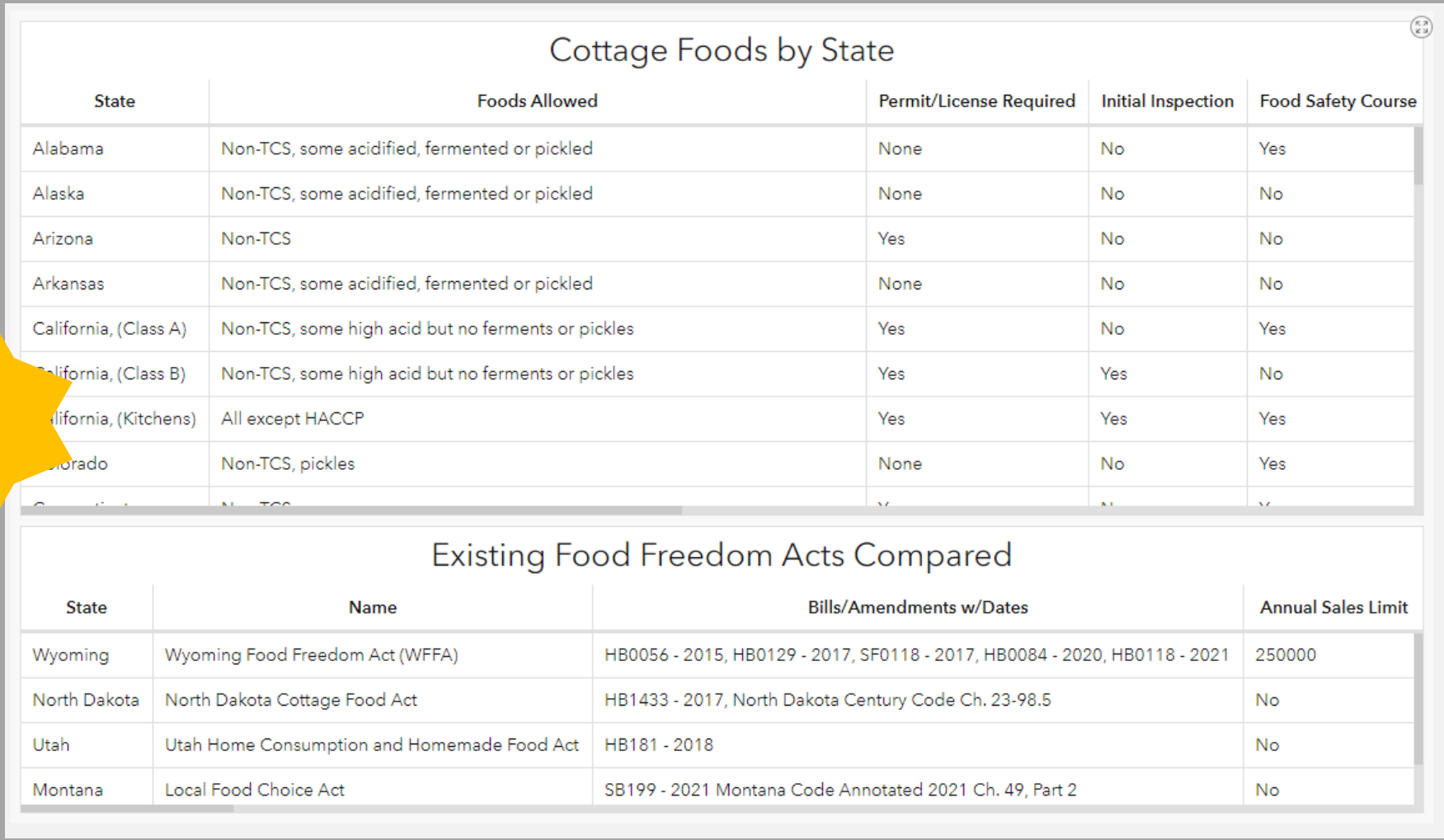
Strengths, Weaknesses, Opportunities, Challenges

Embedded Content from Authoritative Sources



Goodbye Excel… Hello Embedded Iframe!

I'm Interactive!



Cottage Foods by State

State	Foods Allowed	Permit/License Required	Initial Inspection	Food Safety Course
Alabama	Non-TCS, some acidified, fermented or pickled	None	No	Yes
Alaska	Non-TCS, some acidified, fermented or pickled	None	No	No
Arizona	Non-TCS	Yes	No	No
Arkansas	Non-TCS, some acidified, fermented or pickled	None	No	No
California, (Class A)	Non-TCS, some high acid but no ferments or pickles	Yes	No	Yes
ifornia, (Class B)	Non-TCS, some high acid but no ferments or pickles	Yes	Yes	No
ifornia, (Kitchens)	All except HACCP	Yes	Yes	Yes
orado	Non-TCS, pickles	None	No	Yes

Existing Food Freedom Acts Compared

State	Name	Bills/Amendments w/Dates	Annual Sales Limit
Wyoming	Wyoming Food Freedom Act (WFFA)	HB0056 - 2015, HB0129 - 2017, SF0118 - 2017, HB0084 - 2020, HB0118 - 2021	250000
North Dakota	North Dakota Cottage Food Act	HB1433 - 2017, North Dakota Century Code Ch. 23-98.5	No
Utah	Utah Home Consumption and Homemade Food Act	HB181 - 2018	No
Montana	Local Food Choice Act	SB199 - 2021 Montana Code Annotated 2021 Ch. 49, Part 2	No

Embedded PDF's… Do it!

- Easy interaction for public outreach
- Mobile viewing friendly
- No need to download Acrobat Reader
- Built-in document hosting

Engaging Images to Hold Interest

- Shutterstock Account
- Requesting Photos from Friends
- *My Home is Alaska* Facebook group & getting permission to use images
- Canva Pro

Are you hungry yet?

When Should I Use ArcGIS Hub?

- Public outreach
- Stakeholder engagement
- Coordination or collaboration
- Have an important report & don't want it to gather dust!
- Convey an important message (project, initiative, status)
- Potential for GIS tools & content to be helpful in the future
- Don't want to coordinate with IT Department or agency webmaster

Next Steps…

- Advertise Hub Site after public comment on report
- Stand up a Food Systems technical working group under AGC
  - In progress…
  - Please reach out if you'd like to join! hpalmer@dewberry.com

- **What GIS Analysis can help us solve these Food System issues?**
- Meet Logan Bolan!

Food Security Geospatial Analysis Lightning Talk

Logan Bolan

Food Security GIS Analyses Attempted

1. **Food Desert Analysis**
2. **Existing Data for Croplands and Infrastructure**
3. **Human Capital for Staffing Agriculture Industry**

It Shouldn't Be That Hard, Right?!

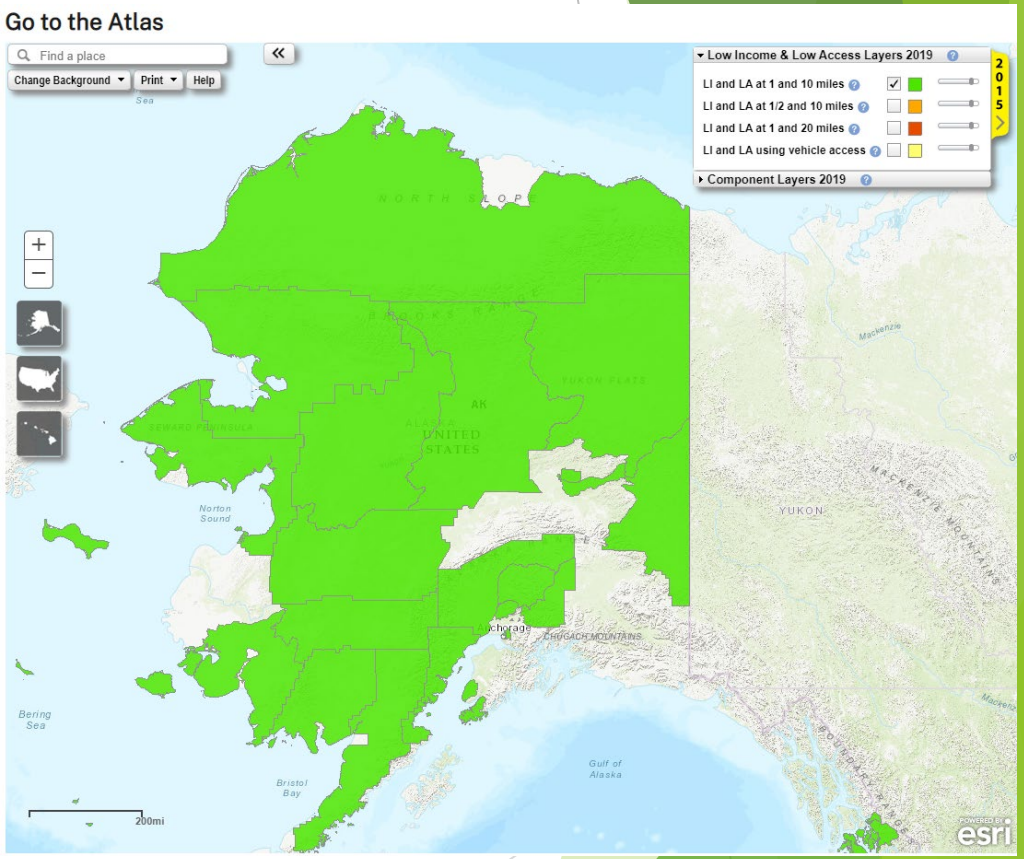
Food Deserts / Food Access

GIS Analysis for Alaska's Food Security

Food Deserts/Food Access

Census tracts qualify as food deserts if they meet low-income and low-access thresholds:

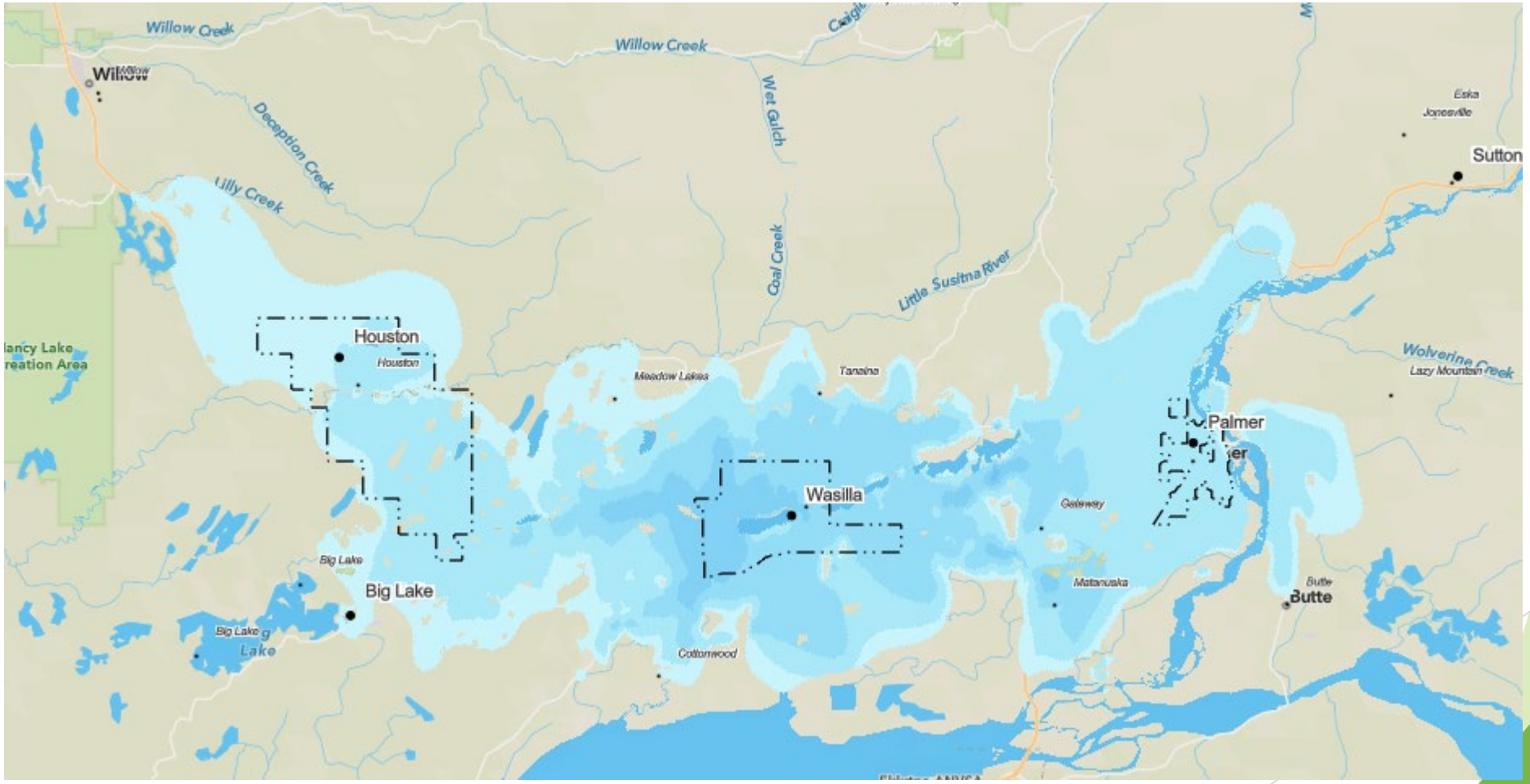
- Low-income: a poverty rate of 20 percent or greater, or a median family income at or below 80 percent of the statewide or metropolitan area median family income;
- Low-access: at least 500 persons and/or at least 33 percent of the population lives more than 1 mile from a supermarket or large grocery store (10 miles, in the case of rural census tracts).



USDA ERS - Data Feature: Mapping Food Deserts in the U.S.

To Identify Food Deserts We Must Know Where All the Grocery Stores are…

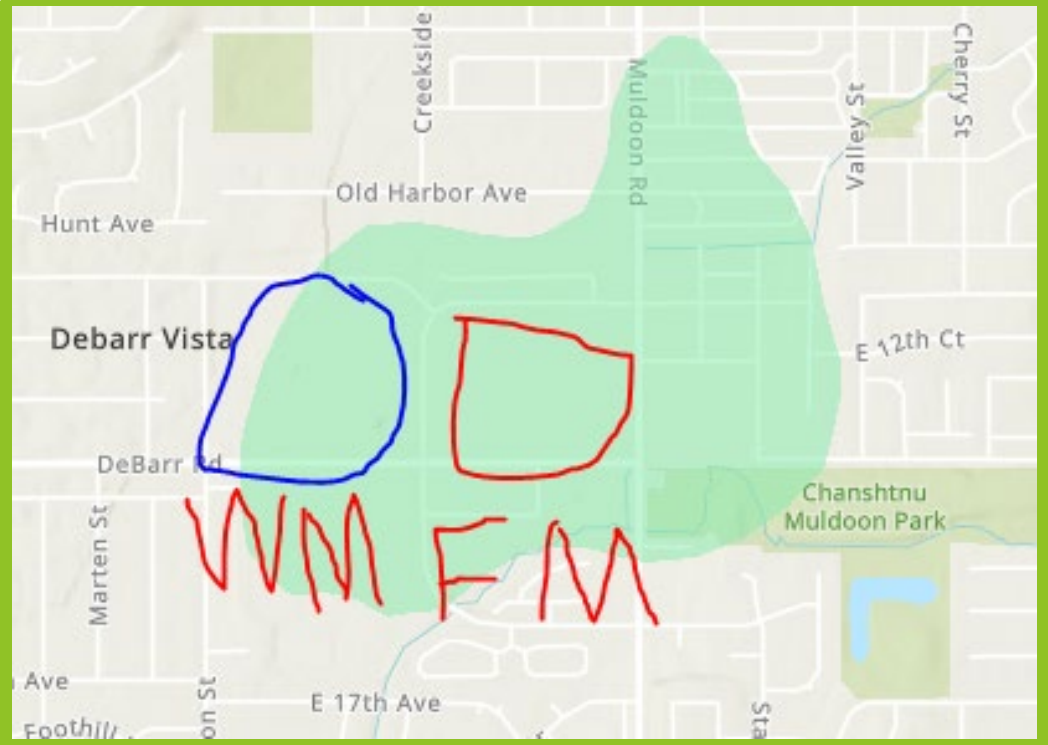
First Attempt: Esri's COVID-19 Food Access Analysis



Grocery stores & convenience stores were missing from the data…

Data Issues Encountered

- Only pulled “supermarket” from the OSM API
- What is it missing?
- Jim’s Store in the Village off the Road System.
- Costco
- Gas Stations
- How can we trust the results?
- How can we derive accurate insights? How can decision-makers trust our results when it’s easy to see our mistakes?



Second Attempt: What if I take the State's Business Endorsement Dataset and filter it to find stores?

BusinessEndors_EAK_Project
1703 records, 1 selected

LicenseNumber	BusinessName	Status	IssueDate	Renew
292270	SHAGELUK NATIVE STORE	Active	11/26/2002, 3:00 PM	11/30/
292271	GRAYLING NATIVE STORE	Active	11/26/2002, 3:00 PM	11/30/
292268	VENETIE NATIVE STORE	Active	11/26/2002, 3:00 PM	11/30/
292273	SHUNGNAK NATIVE STORE	Active	11/26/2002, 3:00 PM	11/30/
292405	CAPT'N JOE'S GAS	Active	12/11/2002, 3:00 PM	10/7/2

Sometimes, data is messy…

What if the village is a dry village?
What if the store is a cannabis store?
What if the store is a saloon?
What if the store is a non-profit like Veterans of Foreign Wars?

…and requires lots of manual data cleaning.

Filtered for “Stores” but Results Include So Many Saloons! Do they sell food also?

LicenseNumber	BusinessName	Status	IssueDate	Renew
292265	SAVOONGA NATIVE STORE	Active	11/26/2002, 3:00 PM	11/30/
292266	KOYUK NATIVE STORE	Active	11/26/2002, 3:00 PM	11/30/
292267	GAMBELL NATIVE STORE	Active	11/26/2002, 3:00 PM	11/30/
292270	SHAGELUK NATIVE STORE	Active	11/26/2002, 3:00 PM	11/30/
292271	GRAYLING NATIVE STORE	Active	11/26/2002, 3:00 PM	11/30/
292268	VENETIE NATIVE STORE	Active	11/26/2002, 3:00 PM	11/30/
292273	SHUNGNAK NATIVE STORE	Active	11/26/2002, 3:00 PM	11/30/
292405	CAPT'N JOE'S GAS	Active	12/11/2002, 3:00 PM	10/7/2
292275	WALES NATIVE STORE	Active	11/26/2002, 3:00 PM	11/30/
292405	CAPT'N JOE'S GAS	Active	12/11/2002, 3:00 PM	10/7/2
292272	BUCKLAND NATIVE STORE	Active	11/26/2002, 3:00 PM	11/30/
292504	COLDFOOT CAMP	Active	11/18/2002, 3:00 PM	12/6/2
292504	COLDFOOT CAMP	Active	11/18/2002, 3:00 PM	12/6/2
292849	THE NEW GOLDEN SALOON	Active	12/17/2002, 3:00 PM	1/21/2
292819	HONEY DEW LOUNGE	Active	12/12/2002, 3:00 PM	12/27/
292776	D.S.S. CORP	Active	1/7/2003, 3:00 PM	10/14/

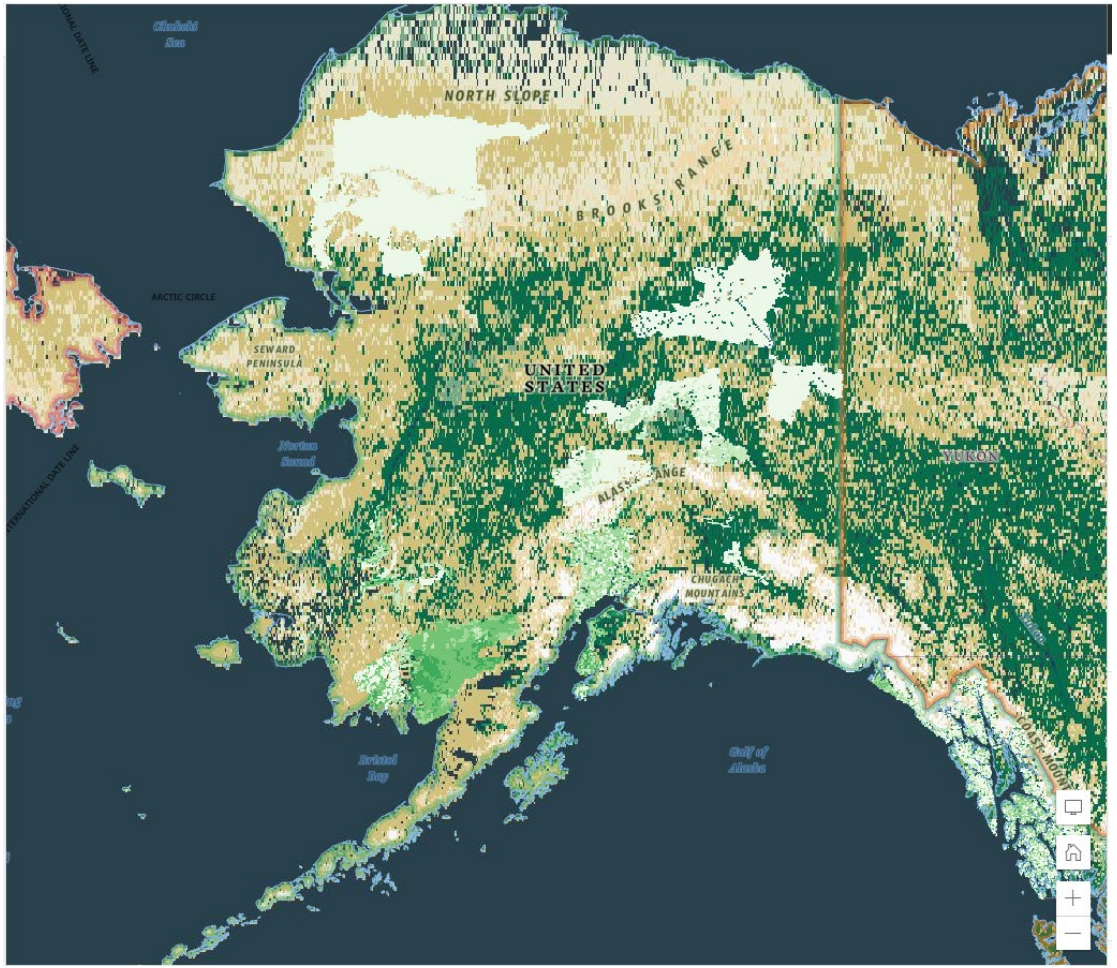
Conclusion: Lots of data cleanup and database structure improvements required to enable food desert analysis for Alaska.

Climate Change Modeling for Crops

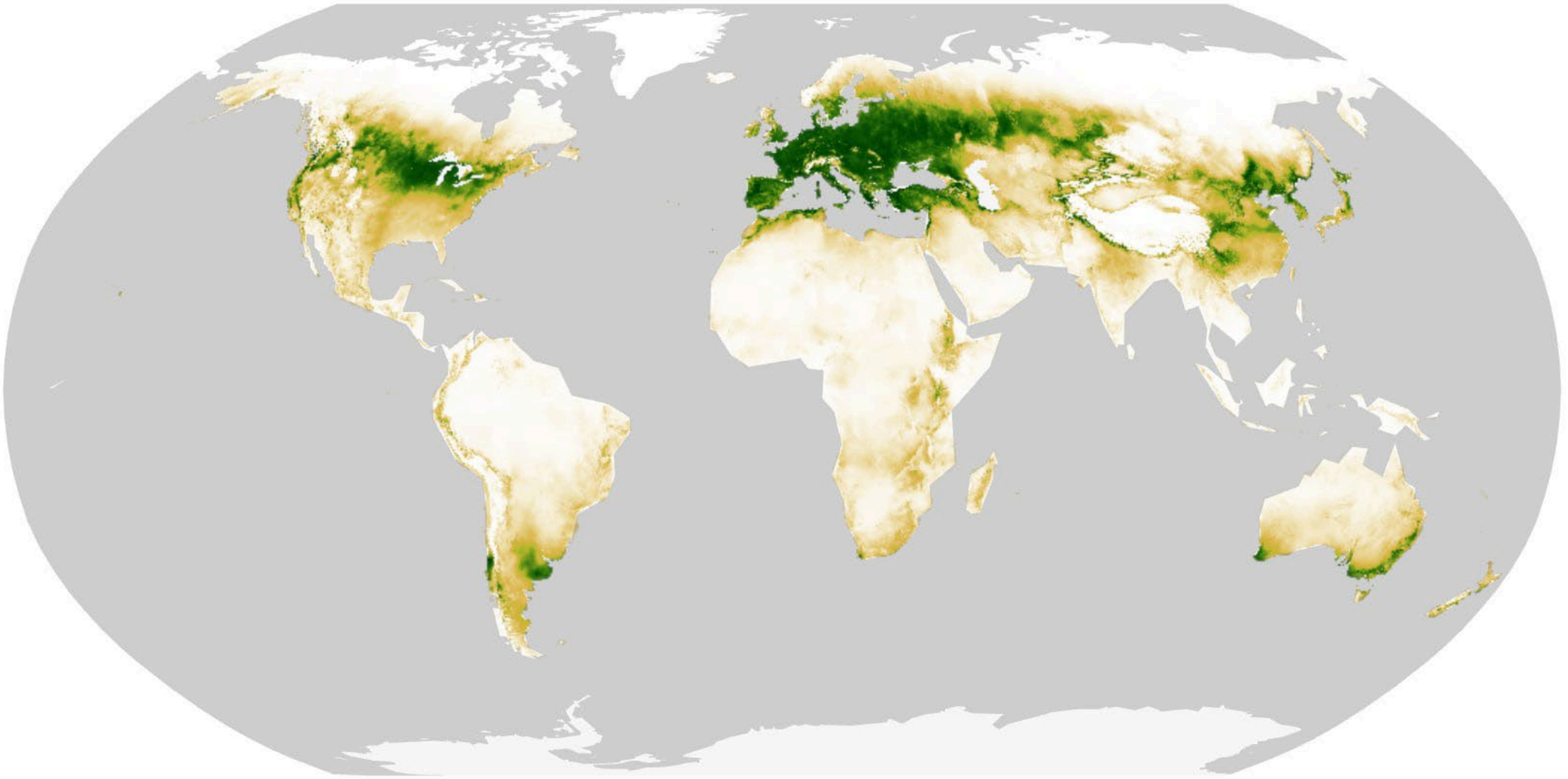
How to predict present and future crop yields.

Croplands in Alaska

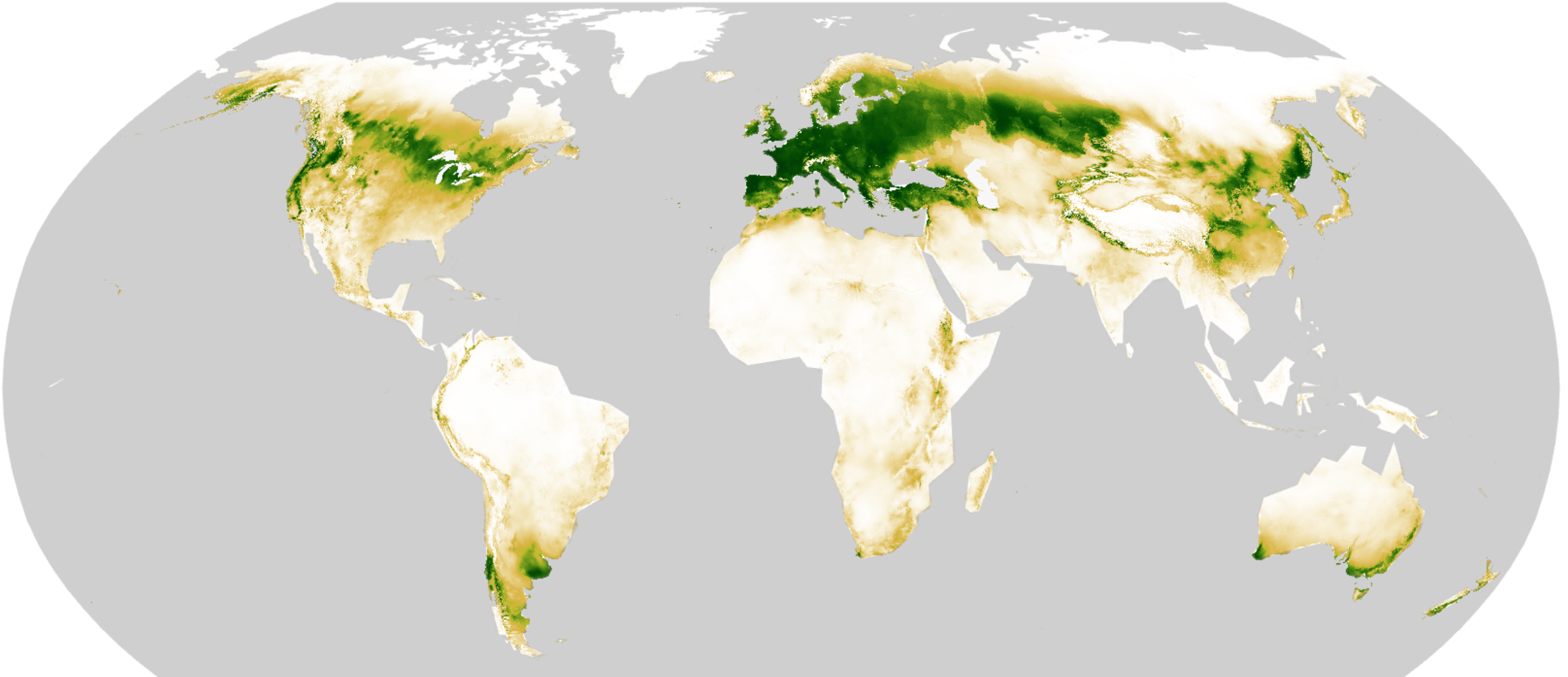
- Where are the croplands in Alaska now?
- Where are they going to be in the future?
- What crops do they support now?
- What crops will they support in the future?


NORTH SLOPE
BROOKS RANGE
ARCTIC CIRCLE
SEWARD PENINSULA
UNITED STATES
YUKON
CHUGACH MOUNTAINS
Gulf of Alaska

Crop Analysis: Where is wheat produced?



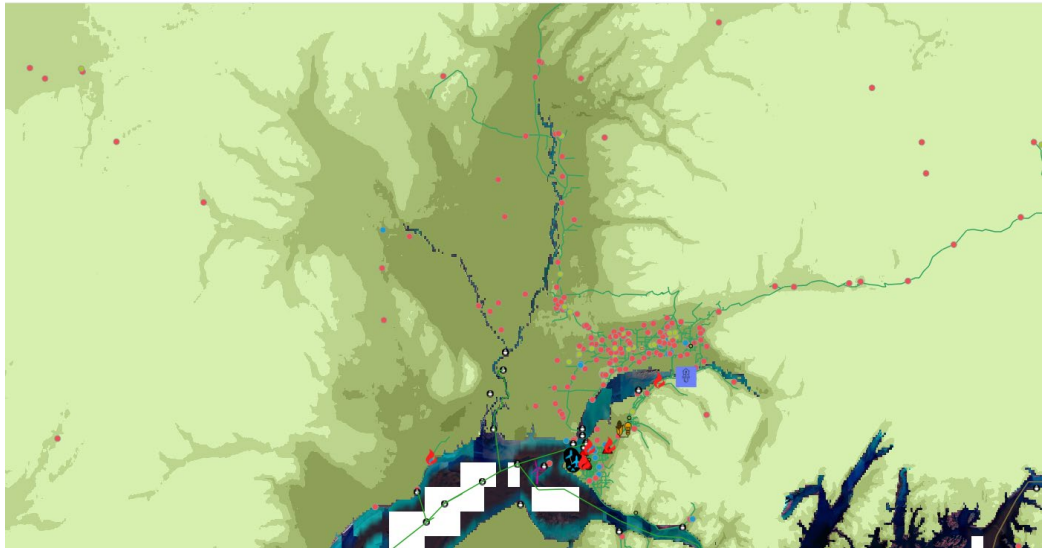
Modeling indicates that Alaska becomes a major wheat producer by 2050!

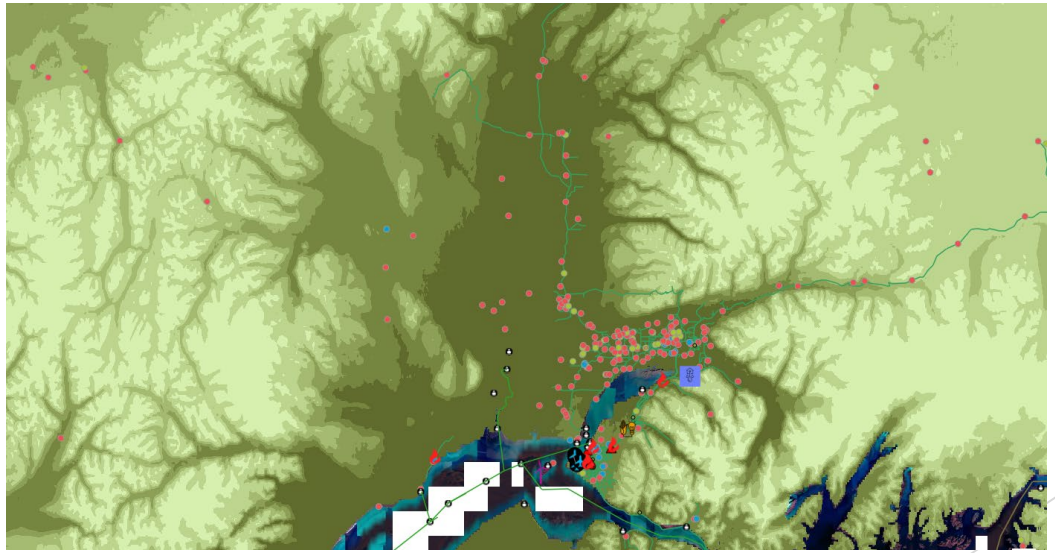


Forecasted Wheat Production in Alaska: Year 2050

Mat-Su Wheat Potential 2020-2050

- What land do we need to set aside for wheat production?
- Using Living Atlas Content to Study Current and Future Threats to Global Food Security (esri.com)
- Using Living Atlas Content to Study Current and Future Threats to Global Food Security - Overview (arcgis.com)






ALASKA RANGE
S Fork Kuskokwim River
West Fork Yentna River
Talkeetna
Talkeetna River
TALKEETNA MOUNTAINS
Oshetna River
Maclaren River
ALASKA RANGE
Skwentna River
ALASKA RANGE
Stony River
Wasilla
Anchorage

Lake Iliamna & Naknek River Wheat Potential 2020-2050

- What infrastructure do we need to build for this potential agricultural boom?
- Using Living Atlas Content to Study Current and Future Threats to Global Food Security (esri.com)
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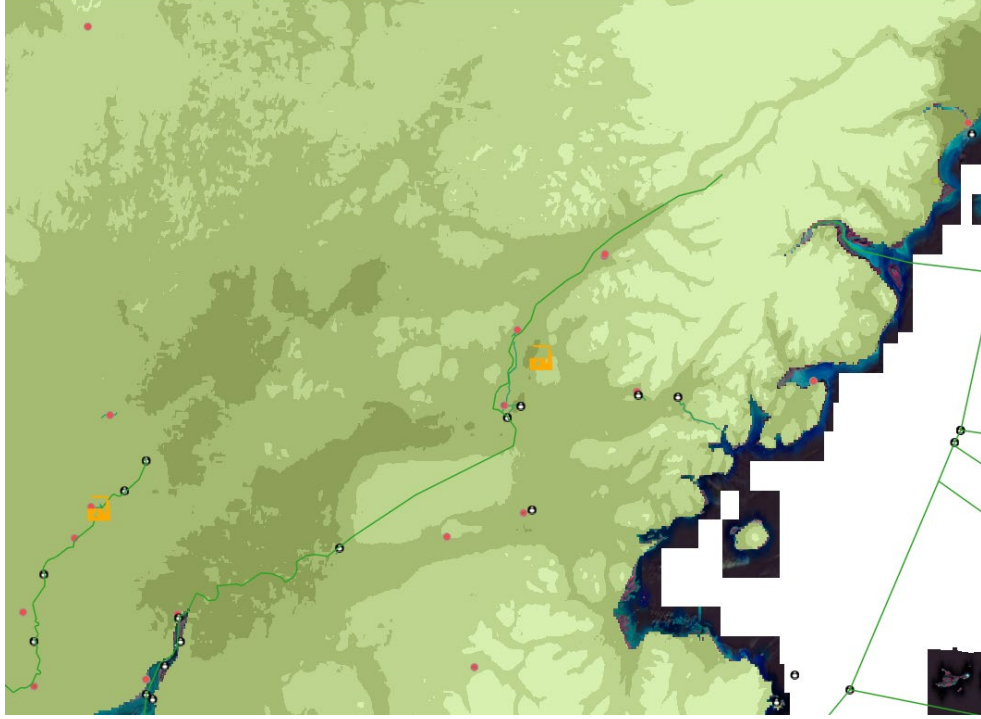
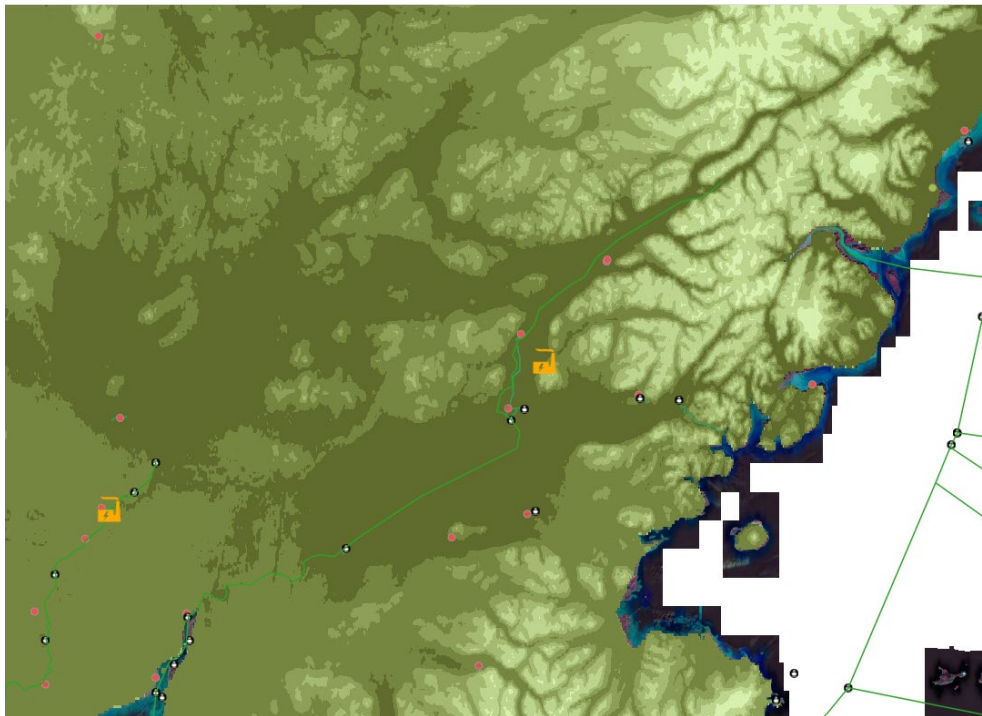
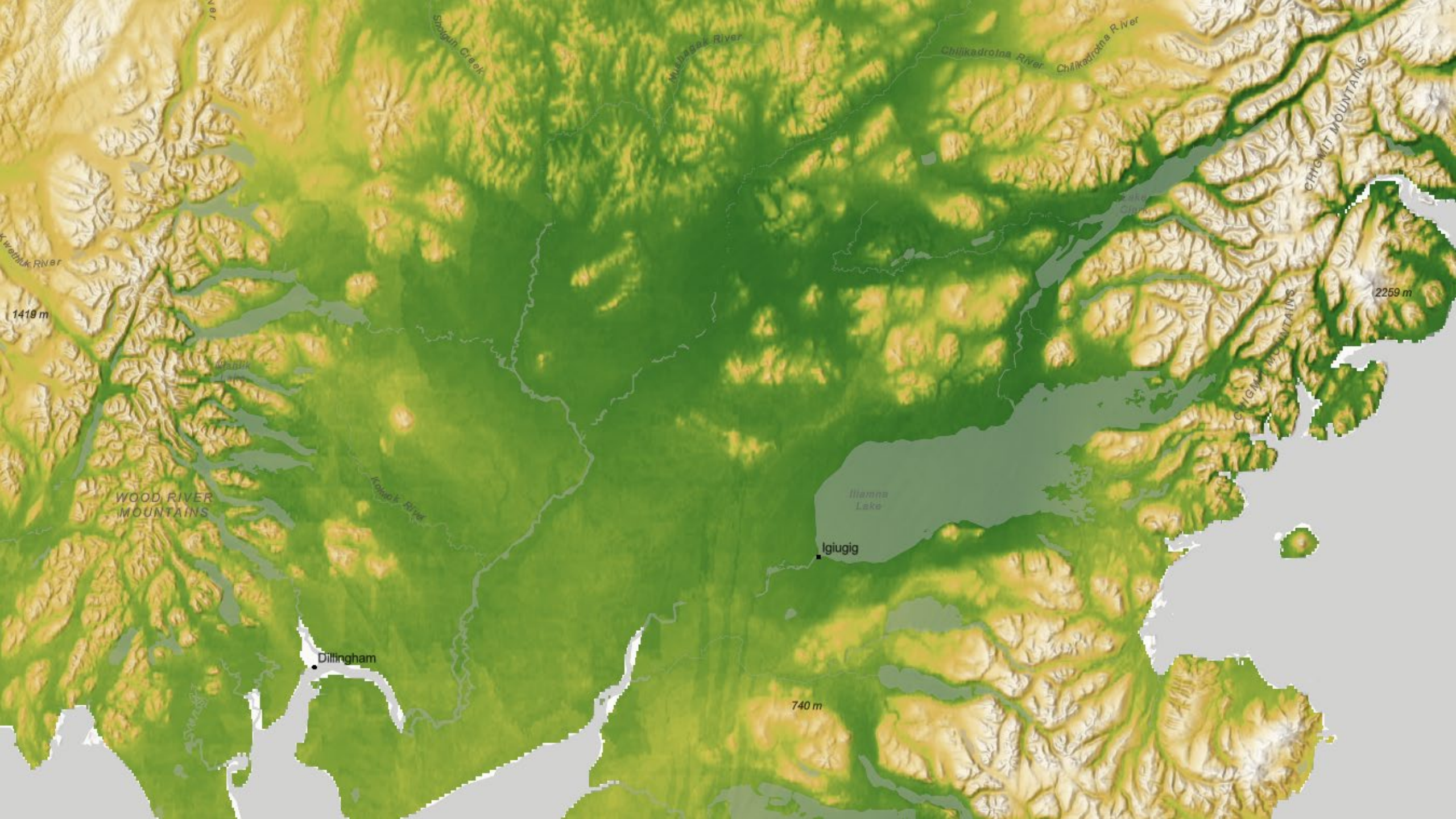


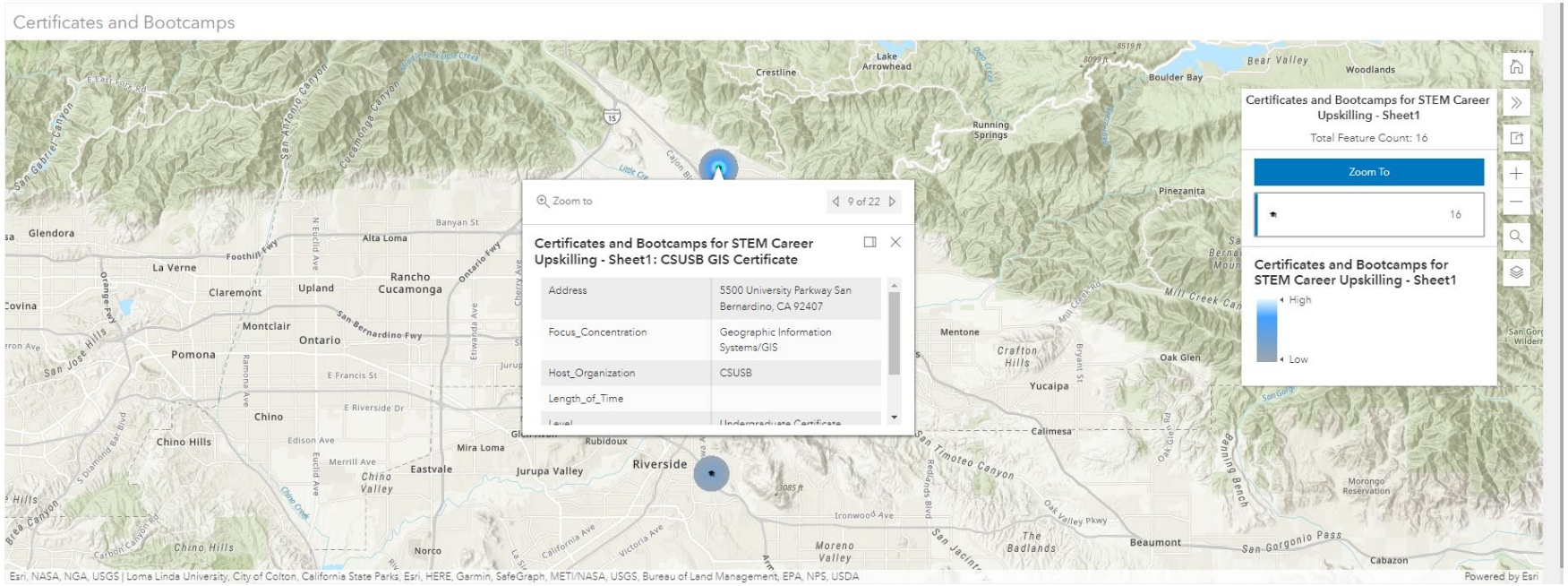



Shotgun Creek
Mulchatna River
Chilikadrotna River
Chilikadrotna River
Kwethluk River
1419 m
Kwethluk
WOOD RIVER MOUNTAINS
Kanuyak River
Iliamna Lake
Igiugig
Dillingham
740 m
CHIGMIT MOUNTAINS
2259 m

Human Capital in Agriculture

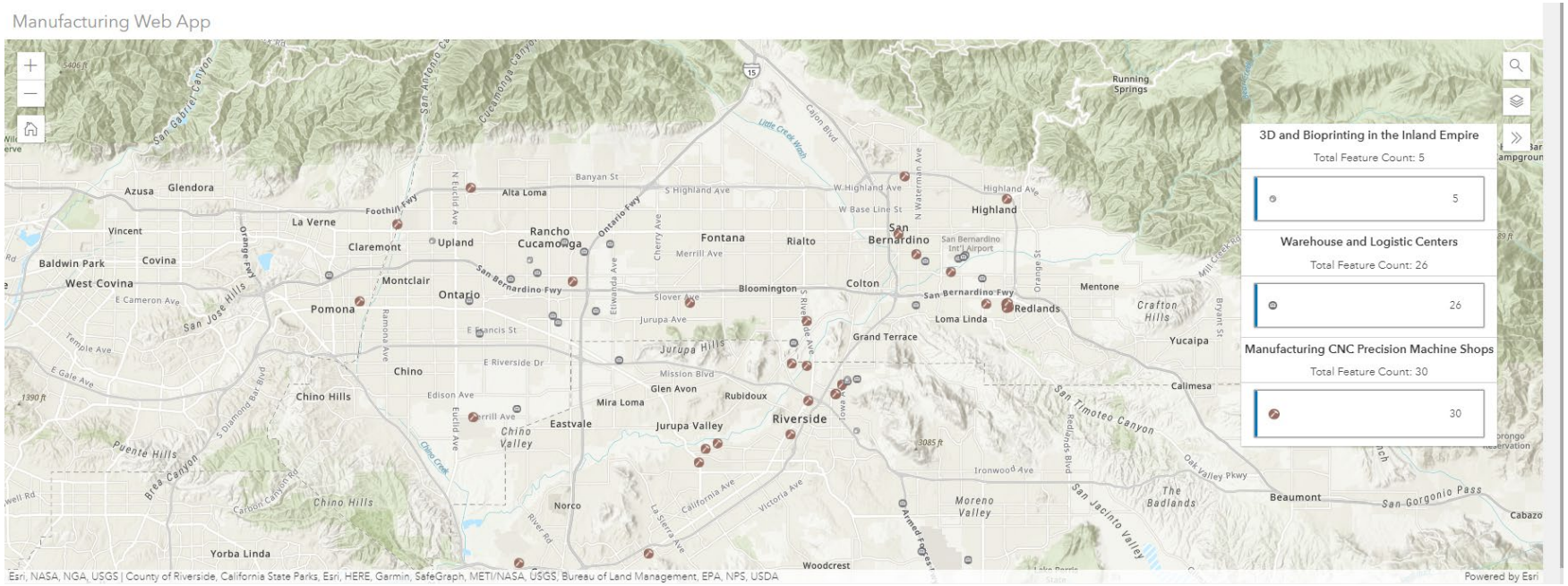
GIS Analysis for Alaska's Food Security

Analysis for Southern California



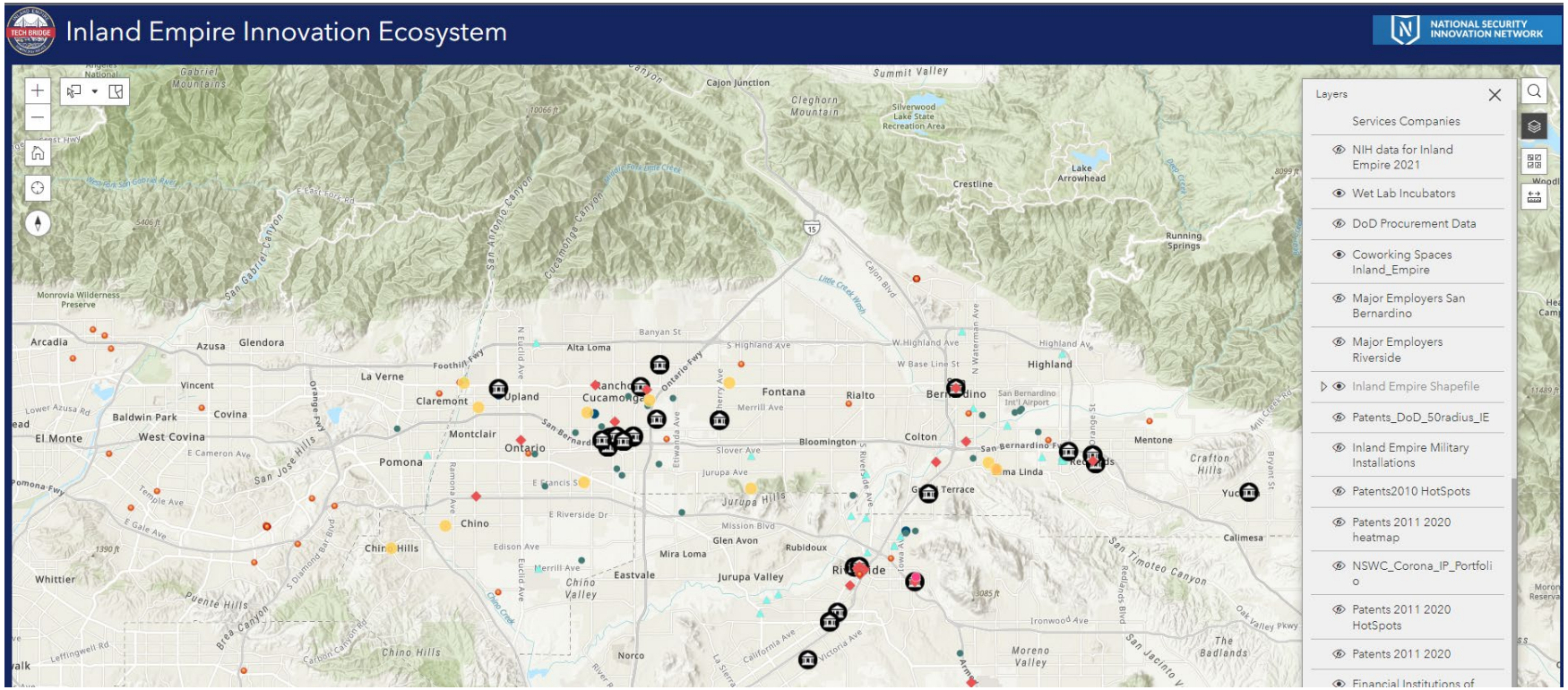
Schools with certificates and/or bootcamps for agriculture workforce development

Analysis for Southern California



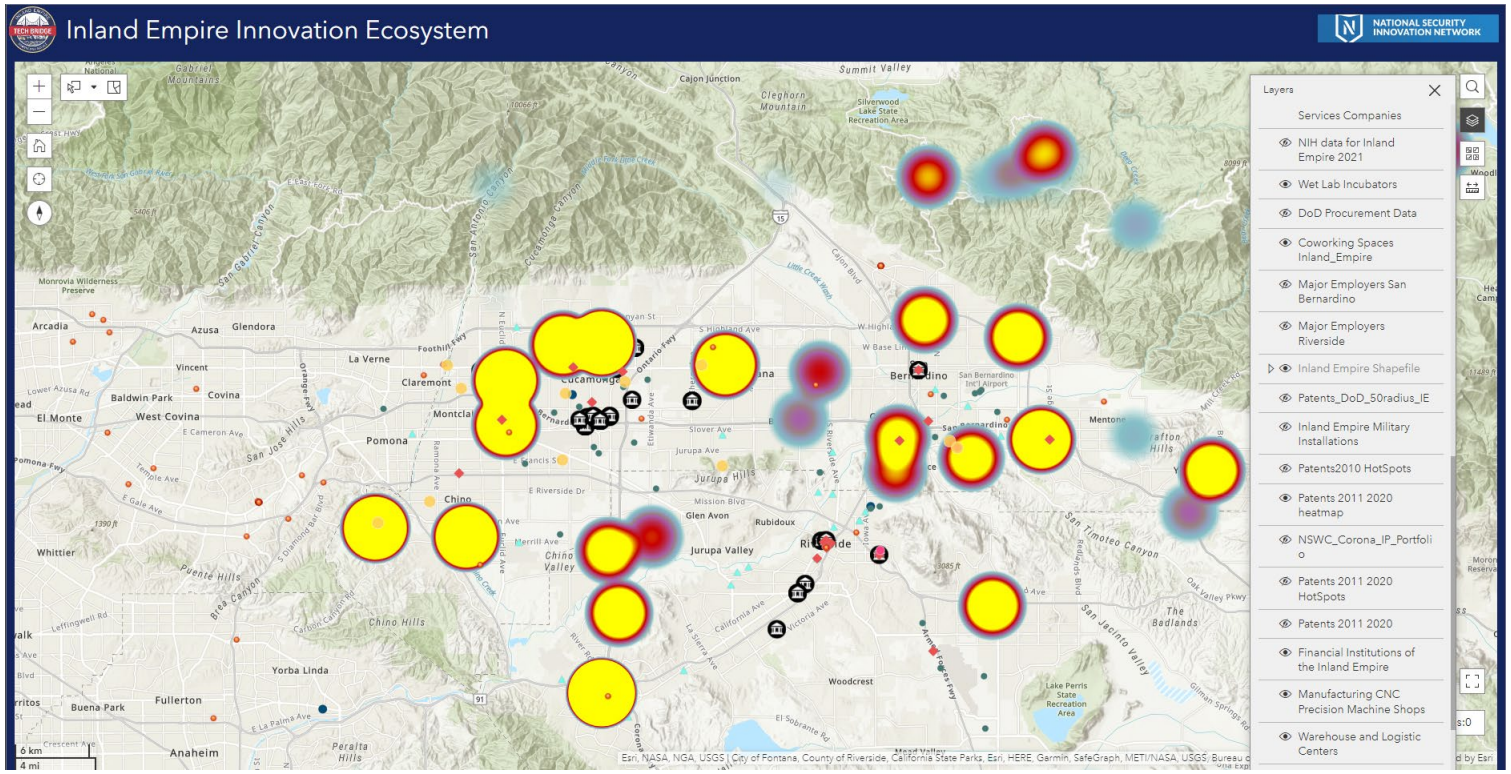
Manufacturing Locations

Analysis for Southern California



Schools + Manufacturing Locations Clustered with Banks

Analysis for Southern California

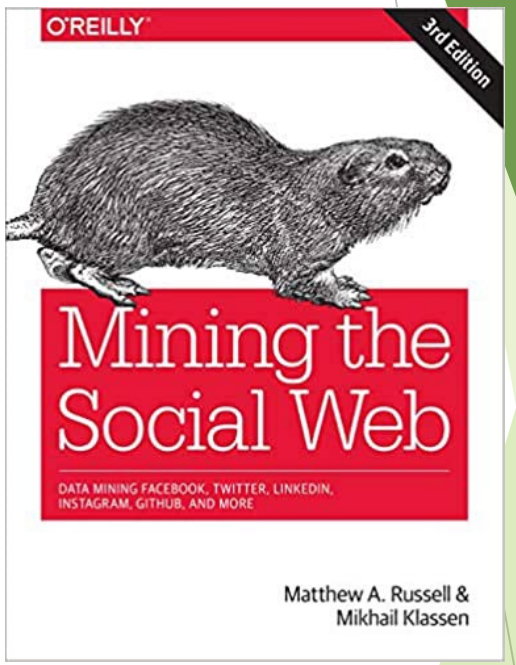


Innovation & Production Hot Spots for Agriculture Industry Human Capital

Figure out where our human talent is and what they are doing, then connecting them with training programs.

Alaska Department of Labor Apprenticeships

Alaska Works Partnership – Construction Education & Training – We are a non-profit organization that gives Alaskans access to jobs and careers in the construction industry.



GitHub - mikhailklassen/Mining-the-Social-Web-3rd-Edition: The official online compendium for Mining the Social Web, 3rd Edition (O'Reilly, 2018)

Mining the Social Web: Data Mining Facebook, Twitter, LinkedIn, Instagram, GitHub, and More 3, Russell, Matthew A., Klassen, Mikhail, eBook - Amazon.com

Precision Agriculture Technician Certificate (Undergrad and Graduate)

19-4012.01 - Precision Agriculture Technicians (onetonline.org)

Apply geospatial technologies, including geographic information systems (GIS) and Global Positioning System (GPS), to agricultural production or management activities, such as pest scouting, site-specific pesticide application, yield mapping, or variable-rate irrigation. May use computers to develop or analyze maps or remote sensing images to compare physical topography with data on soils, fertilizer, pests, or weather.

Sample of reported job titles: Crop Specialist, Independent Crop Consultant, Nutrient Management Specialist, Precision Agriculture Specialist (Precision Ag Specialist), Precision Farming Coordinator, Soil Fertility Specialist

Occupational Endorsement Certificate in Geographic Information Systems < CourseLeaf (alaska.edu)

Dietetics & Nutrition | School of Allied Health | University of Alaska Anchorage

Project Management Department | Project Management | University of Alaska Anchorage

Supply Chain Management - Master's Degree | Admissions | University of Alaska Anchorage

Occupations Critical for Agriculture – How many do we have in Alaska?

- Agricultural Engineers
- Biologists
- Conservation Scientists
- Environmental Scientists and Specialists, Including Health
- Geoscientists, Except Hydrologists and Geographers
- Hydrologists
- Industrial Ecologists
- Microbiologists
- Precision Agriculture Technicians
- Range Managers

- Agricultural Technicians
- Conservation Scientists
- Environmental Scientists and Specialists, Including Health
- Farmers, Ranchers, and Other Agricultural Managers
- Forest and Conservation Technicians
- Geological Technicians, Except Hydrologic Technicians
- Industrial Ecologists
- Range Managers
- Soil and Plant Scientists

“He aha te me nui o te ao.
He tangata, He tangata.”

--Maori Proverb (Found in Chad Ford - Dangerous Love - A Self Help Book on Transforming Conflict (dangerouslovebook.com))

“What is the most important thing in the world?
It is people. It is people. It is people.”