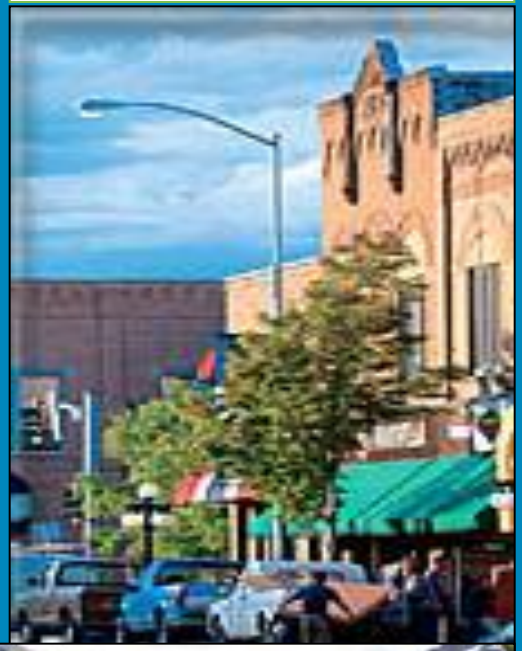



Crown Managers Partnership



Transboundary Collaborative Solutions to Ecosystem Management at the Landscape Scale

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[1] University of Calgary

[2] University of Montana




Landscapes Analysis

- A collaborative research project delivering knowledge and information products to managers on indicators of ecological integrity
- A focus on seamless, transboundary datasets spanning the entire CCE
- A flexible foundation capable of supporting a broad range of ecological applications
- A monitoring framework designed to capture changing landscape conditions

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Crown Managers Partnership (CMP)

Vision

"An ecologically healthy Crown of the Continent Ecosystem"

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Ecological Health Project

- Long-term, multi-faceted project aimed at defining a level of ecological health that can inform agencies' management;
- Multi-year strategic priority for CMP;
- Establish on indicators-based, environmental outcomes approach

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Indicators of Ecological Health

- Landscape
- Biodiversity
- Water quality
- Invasives
- Climate
- Air quality
- Cultural

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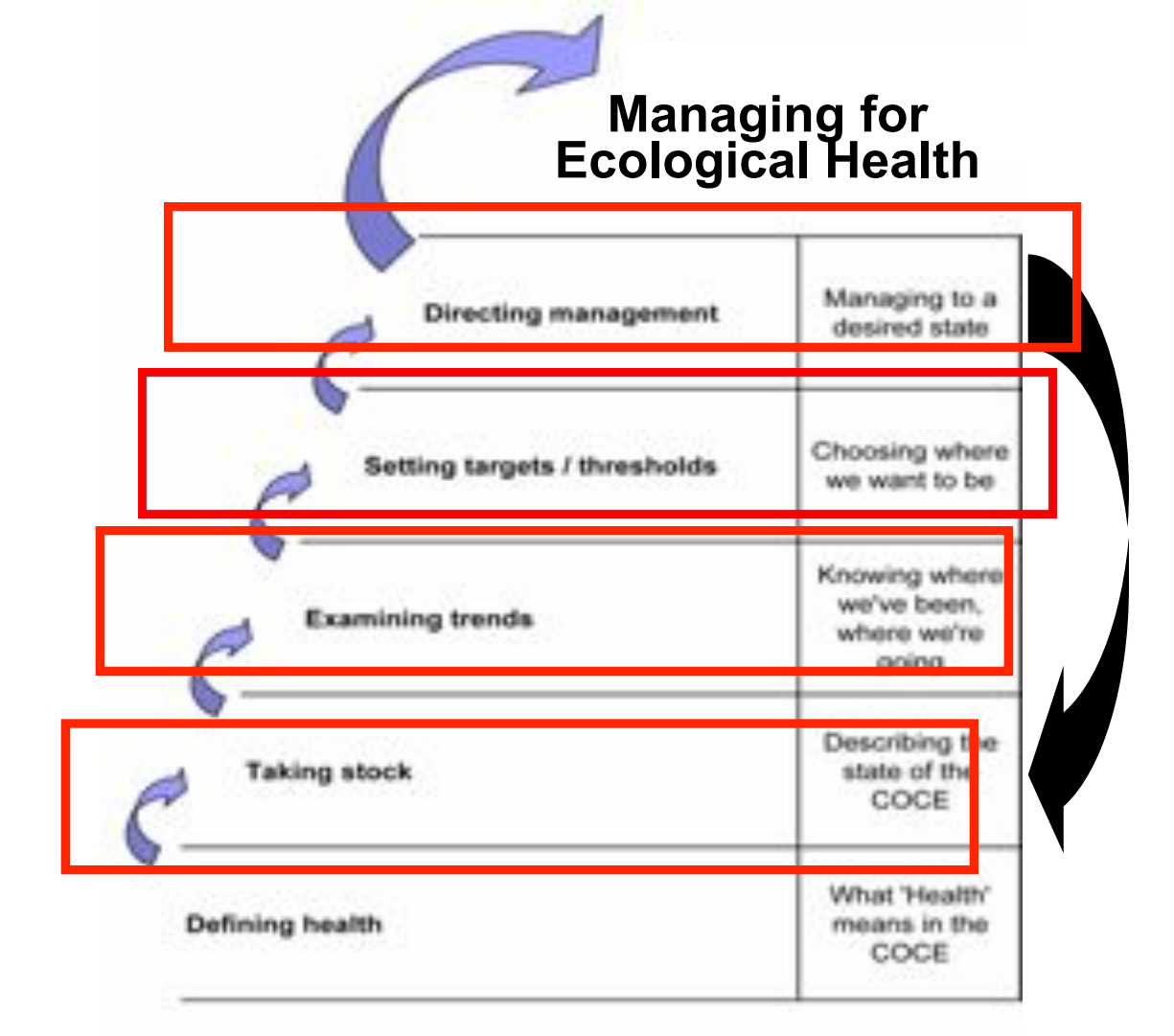
Managing for Ecological Health



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Landscape-scale Trend Analysis

- Synthesize existing datasets to create a seamless transboundary database for landscape indicators
- Measure change across the CCE – Trend analysis
- Baseline year: 2000 - update every 5 yrs

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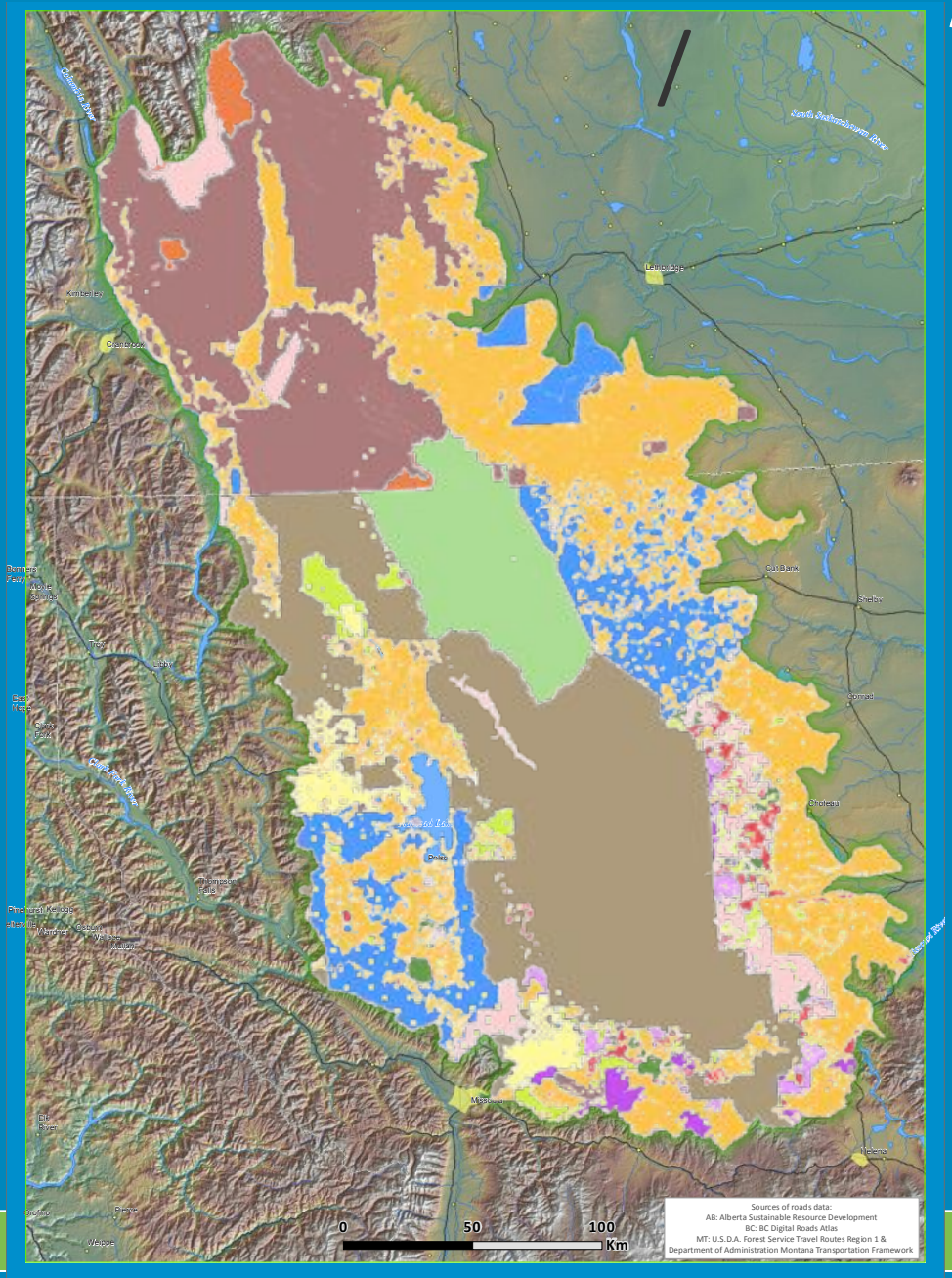
The Partnership

- Crown Managers Partnership – Steering Committee
- NPS – Rocky Mountain Inventory and Monitoring Network
- University of Calgary, Foothills Facility for Remote Sensing and GIScience
- Great Northern Landscape Conservation Cooperative
- Roundtable for the Crown of the Continent – Adaptive Management Initiative

Jurisdictional Complexity in the Crown of the Continent



- First Nations/Tribal land
- National Parks
- US Bureau of Land Management
- US Fish & Wildlife
- US Forest Service
- Federal
- Provincially Protected Areas
- State Trusts
- Montana Fish, Wildlife, & Parks
- Provincial/State
- Private Conservation Land
- Plum Creek Timber
- Private Land

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Landscape Indicators & Datasets

Develop a suite of comprehensive transboundary geospatial datasets and maps representing various attributes of the landscape at the CCE scale and applicable to the assessment

Indicators
Roads
Road use
Human structures and human use
Rivers/Riparian
Species composition
Vegetation structure
Net primary productivity
Forest/non-forest

Datasets
Roads/Railroads/Trails
Census statistics
Streams/hydrology
Land cover
Crown closure

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Landscape-scale Trend Analysis

- **Data-base: Inventoried and synthesized all of the freely available geospatial data within the CCE for the land cover, phenology, disturbances, hydrology and roads**
- **First series of baseline data maps**
- **Two Reports:**
  - ***CMP Landscapes Data Review Report – A Review of Baseline Geospatial Datasets for the Crown of the Continent Ecosystem Landscape Project***
  - ***NPscapes Products: Presenting examples of maps and statistical tables derived through NPscape (2010)***

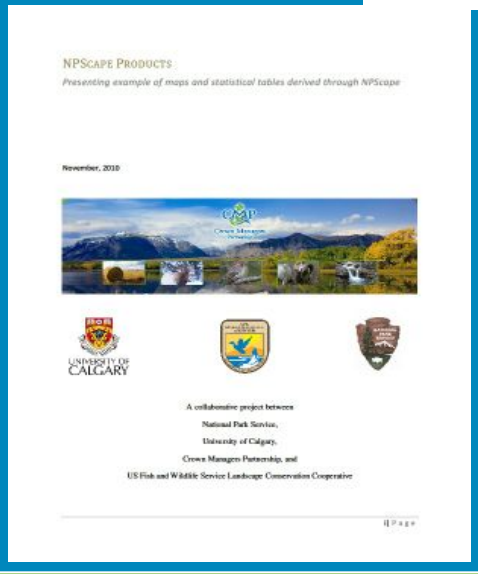

CROWN MANAGERS PARTNERSHIP LANDSCAPES DATA-REVIEW REPORT

A review of baseline geospatial datasets for the Crown of the Continent Ecosystem Landscape project

November, 2010

UNIVERSITY OF CALGARY

A collaborative project between
National Park Service,
University of Calgary,
Crown Managers Partnership, and
US Fish and Wildlife Service Landscape Conservation Cooperative


NPSCAPE PRODUCTS

Presenting example of maps and statistical tables derived through NPScape

November, 2010

UNIVERSITY OF CALGARY

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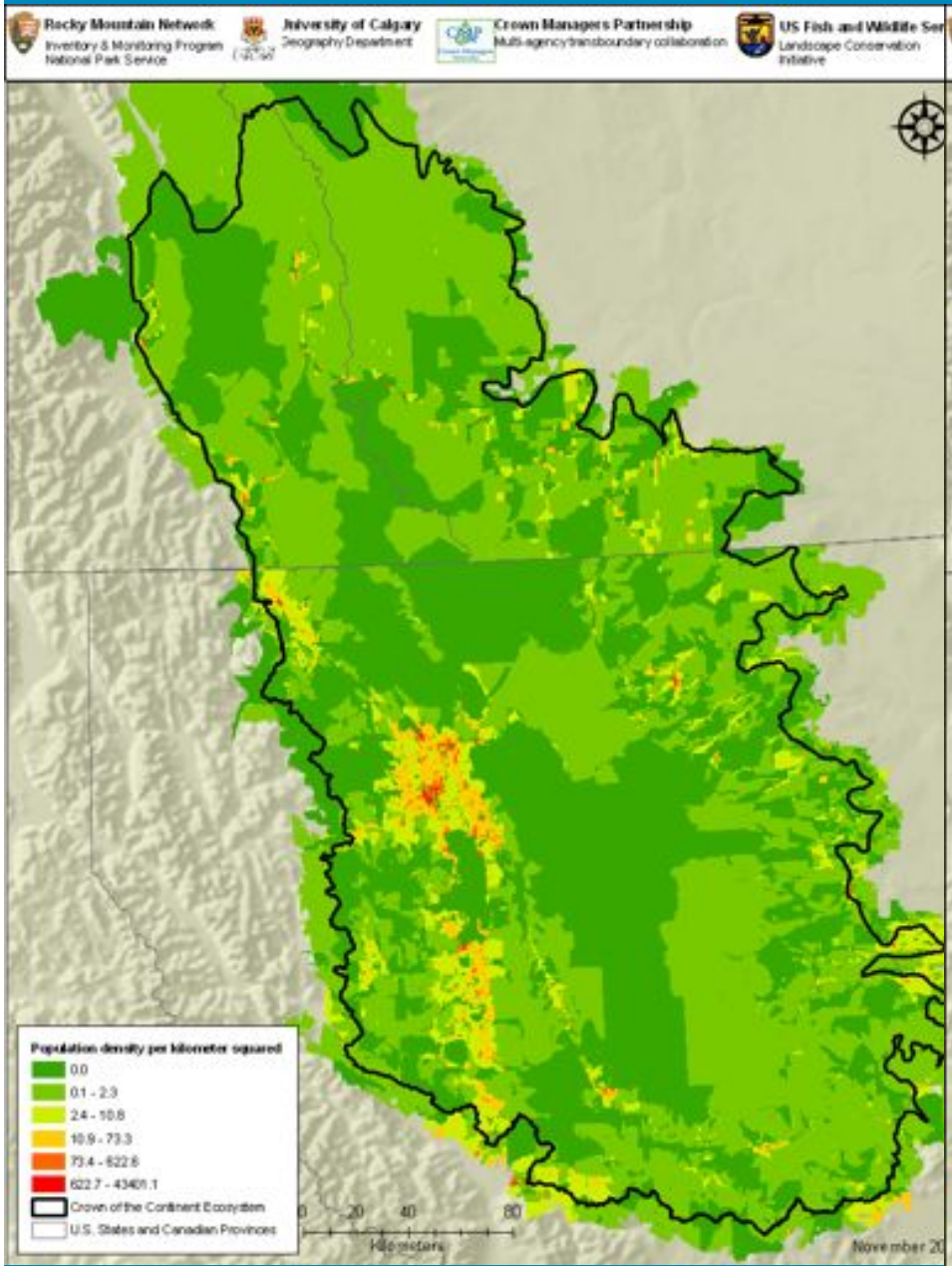
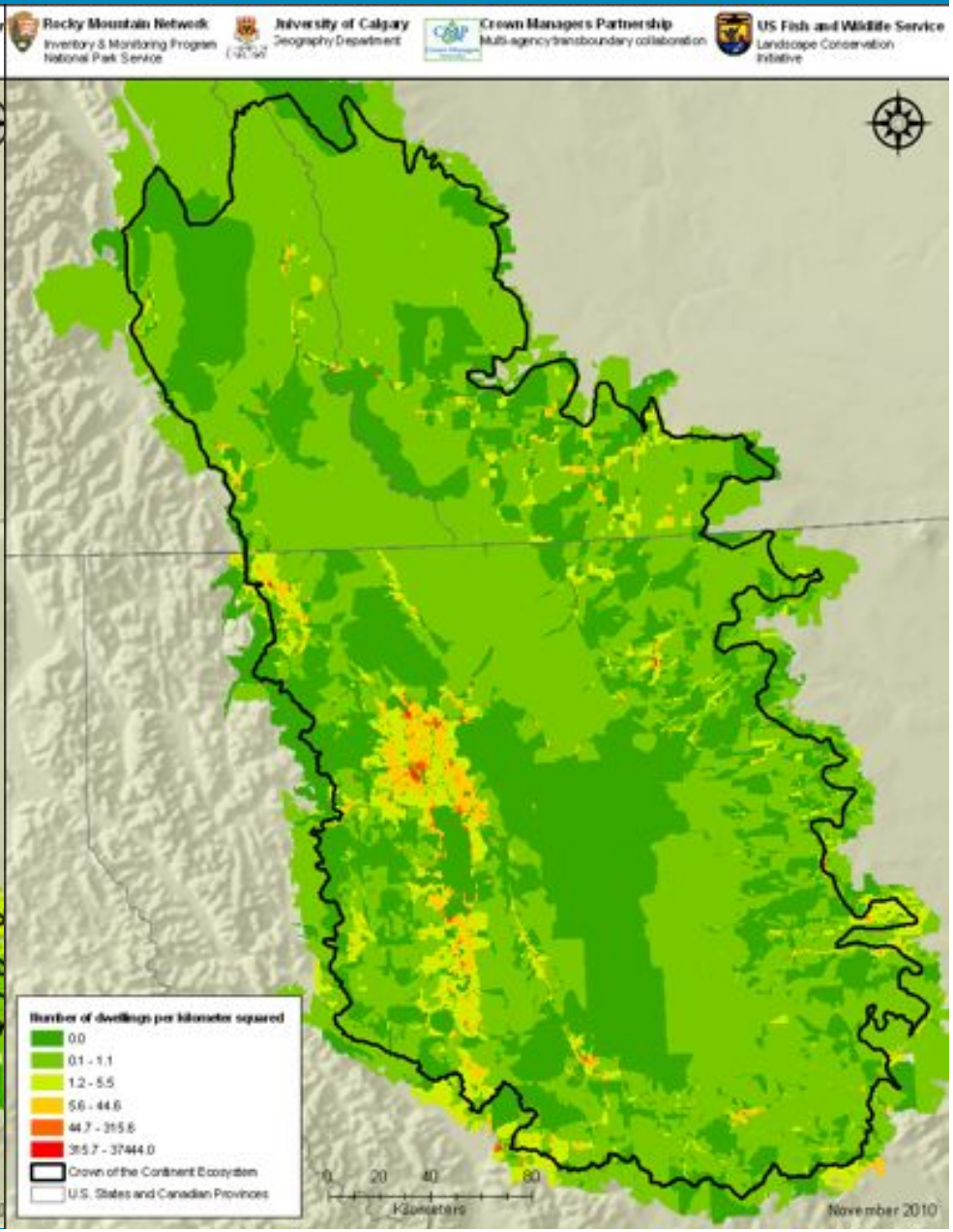
Census data

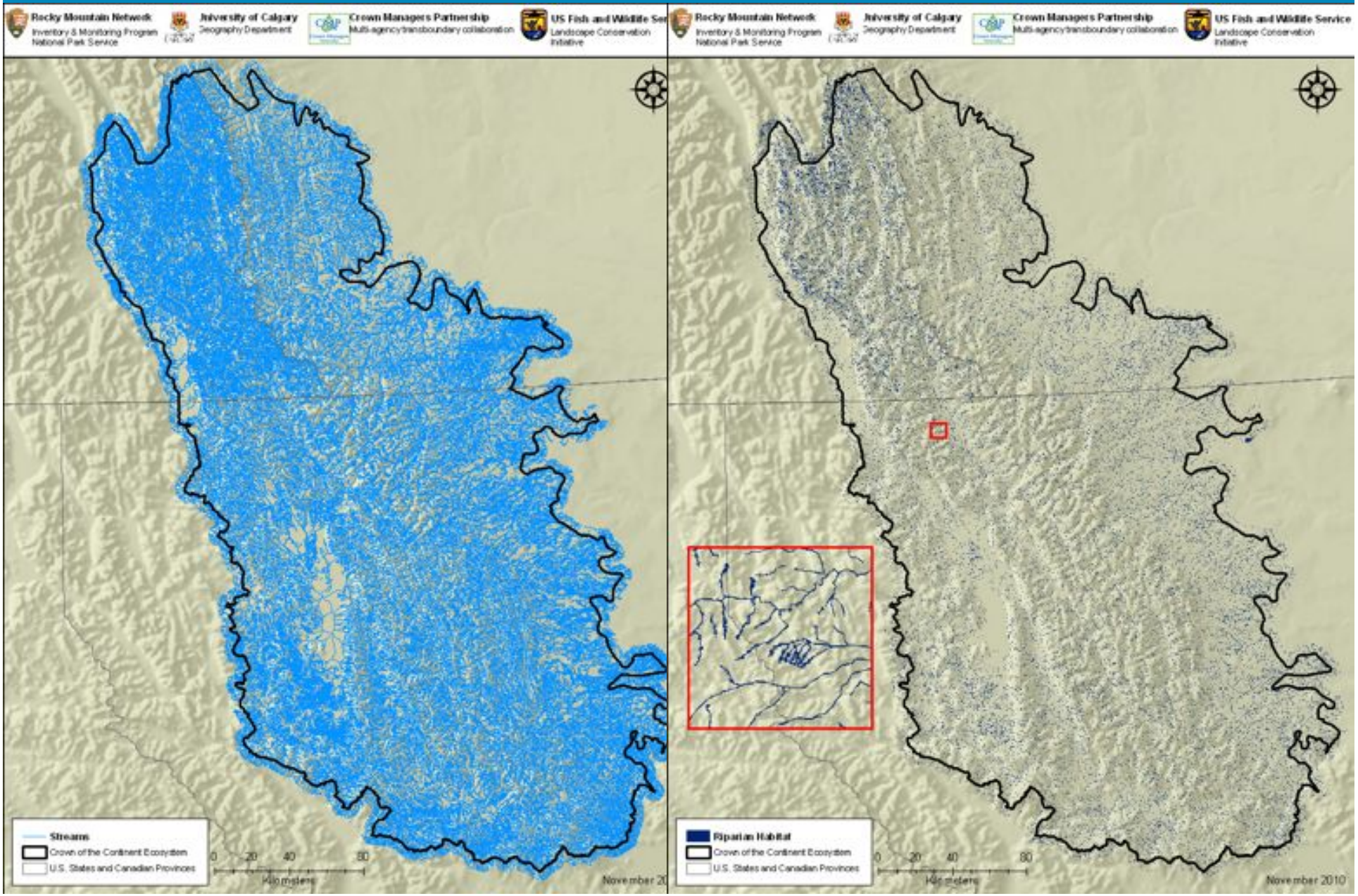
Population density



Dwelling density

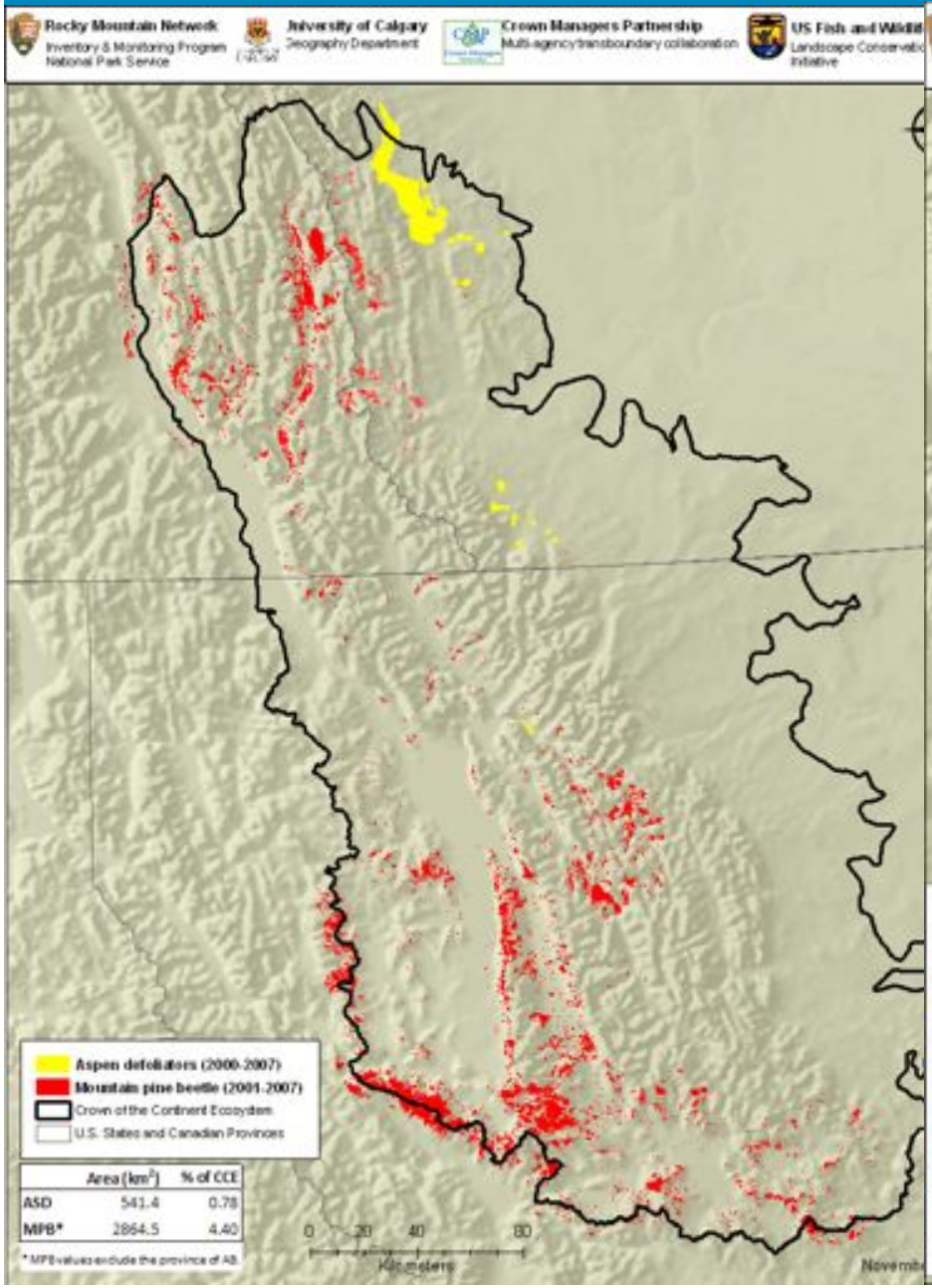


Streams and riparian buffers

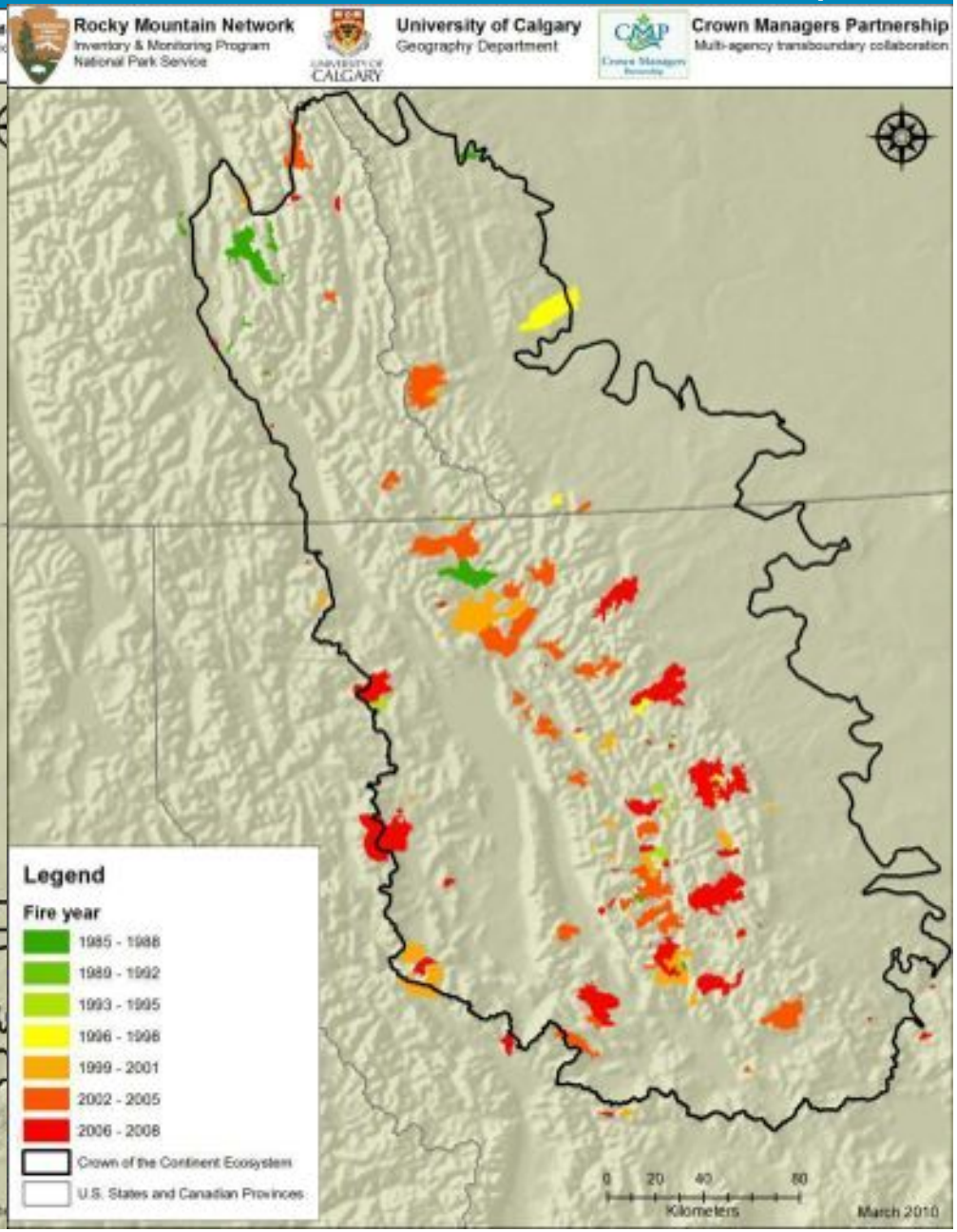


Natural disturbances

Insects



Fire history

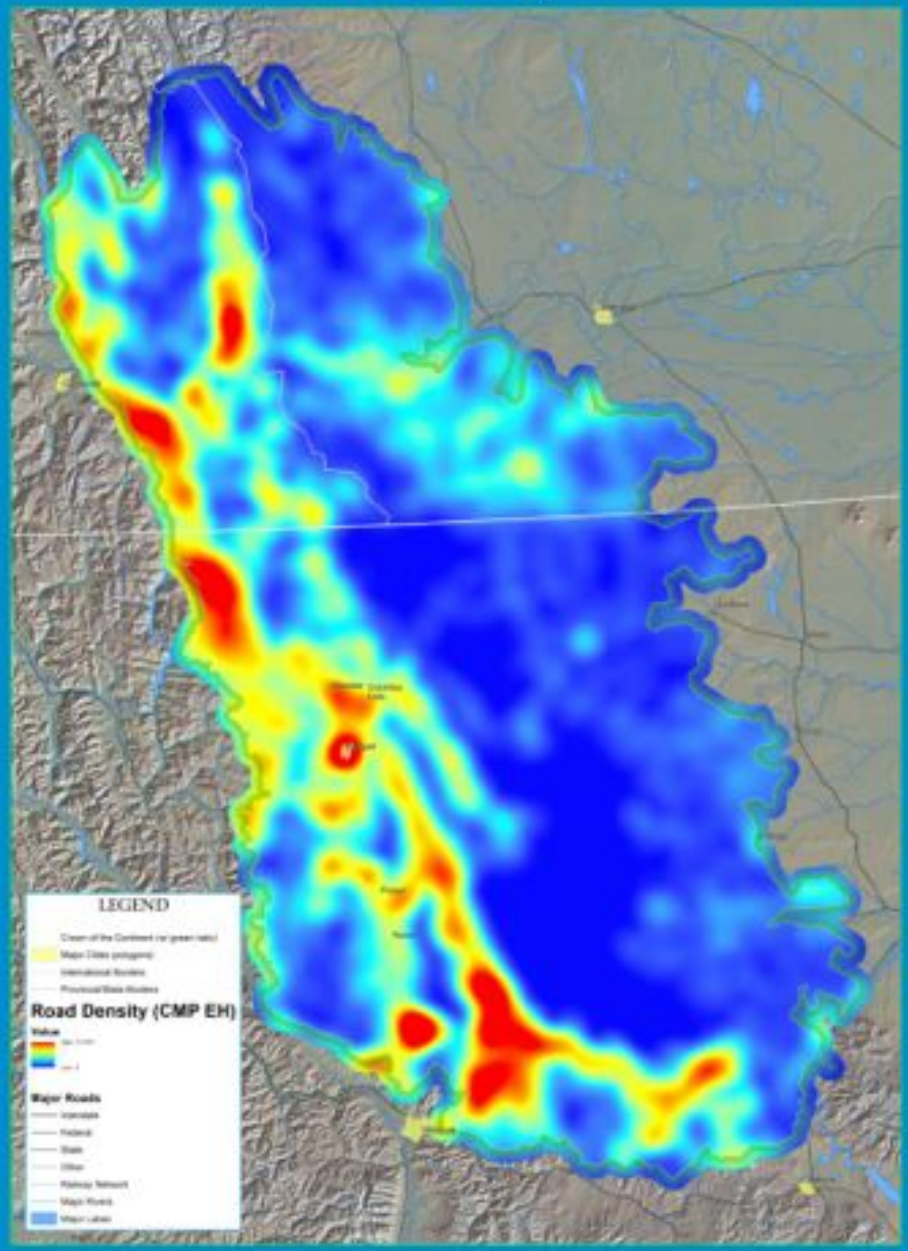


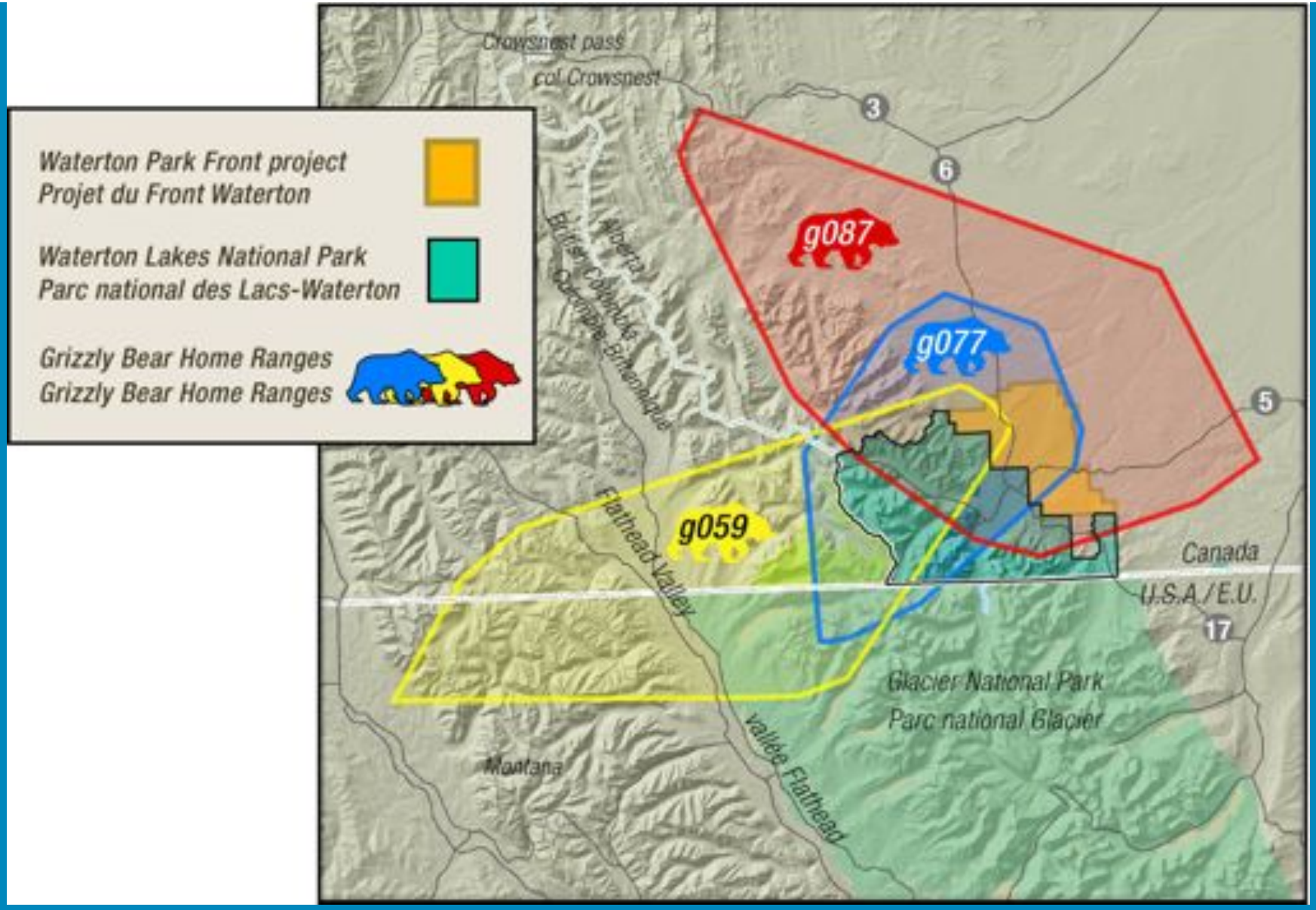
CROWN OF THE CONTINENT

Roads

CROWN OF THE CONTINENT

Road Density





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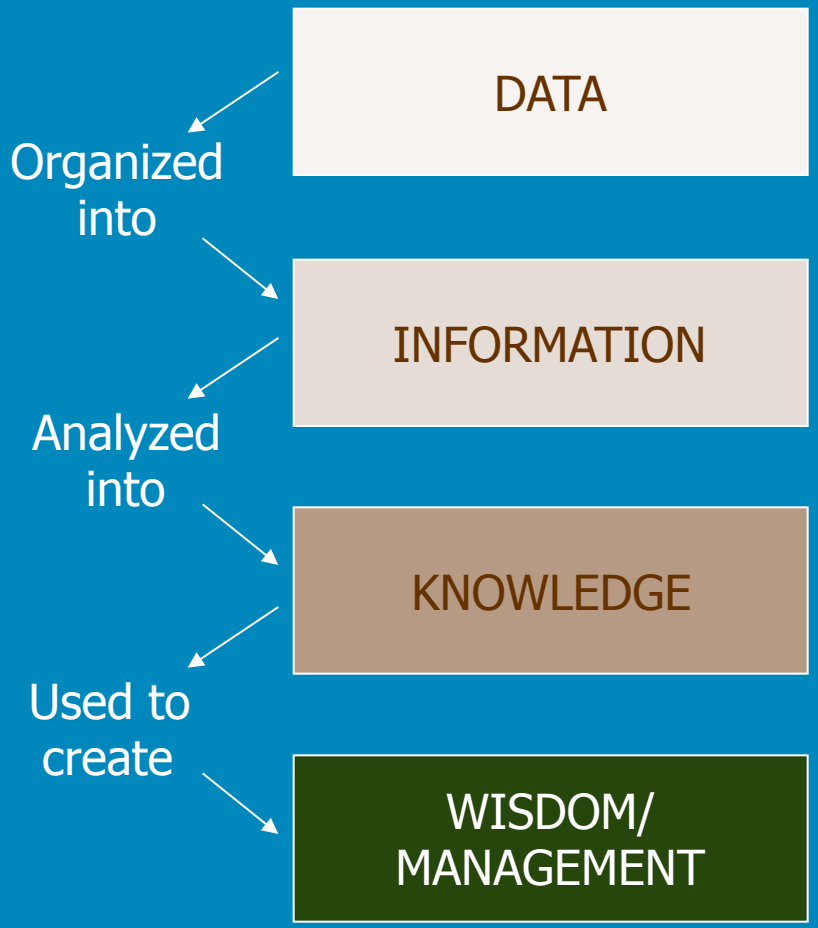
Knowledge Formulation: The Transformation of Data to Wisdom



Raw facts

Data selected, assembled, and prepared for a particular use

Information understood, usually with *context* and *evidence*

Informed decisions made

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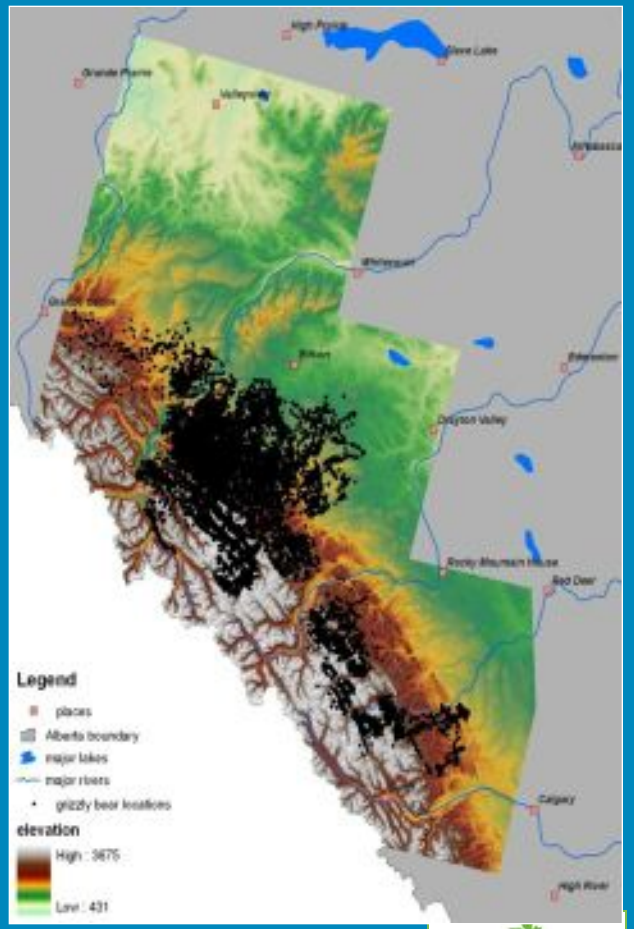
The Role of Geospatial Information

- Geospatial information plays a central role in modern resource management
- Establishes the foundation for higher-level knowledge products

Where are Grizzly Bears on the Landscape?



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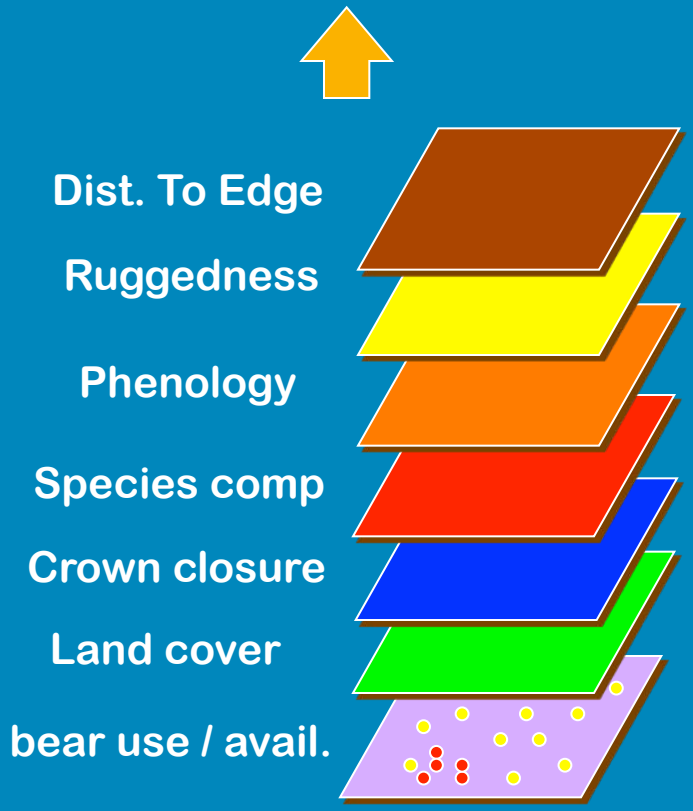
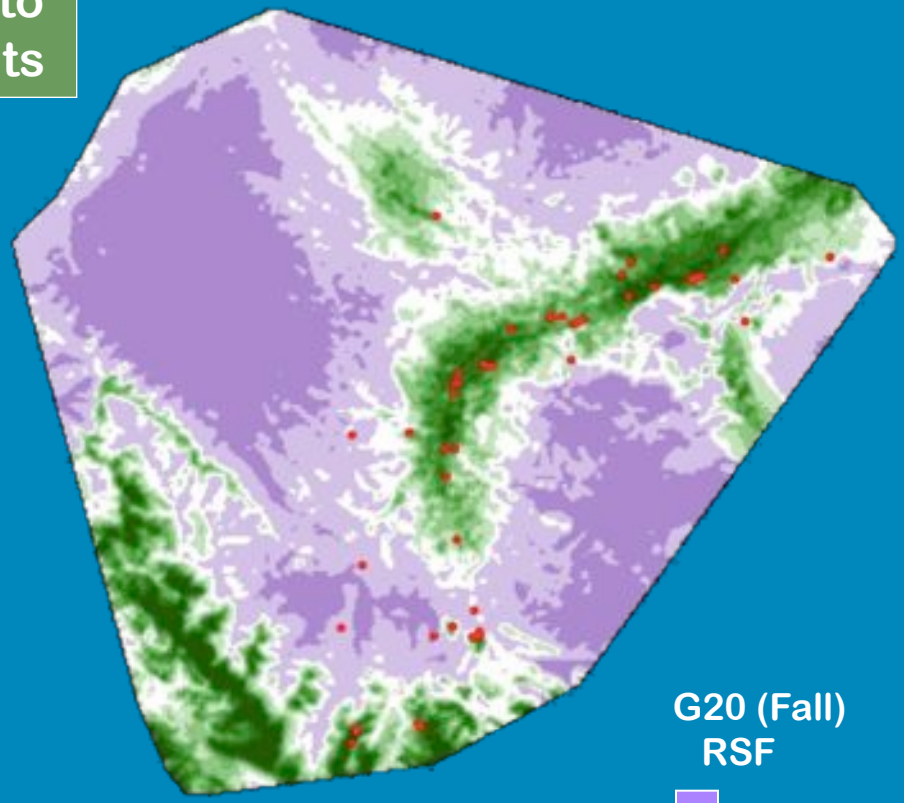
RSF "Probability of Occurrence" Maps. An RSF is any function that is relative to the probability of use for resource units

Statistical Modeling





Testing pt (validation location)

G20 (Fall) RSF

Low
Mid
High

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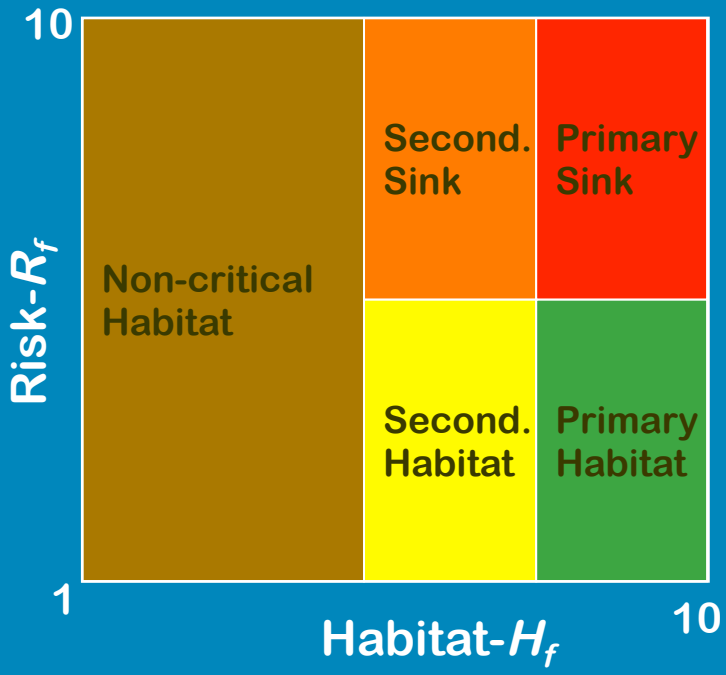
Two-Dimensional Habitat Model



- Non-critical habitat
- Secondary sink
- Secondary habitat
- Primary sink
- Primary habitat

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Creating a seamless transboundary database

- Goal: To acquire and synthesize existing datasets to create a seamless transboundary database across the entire CCE

- Baseline year: 2000
- Update every 5 years

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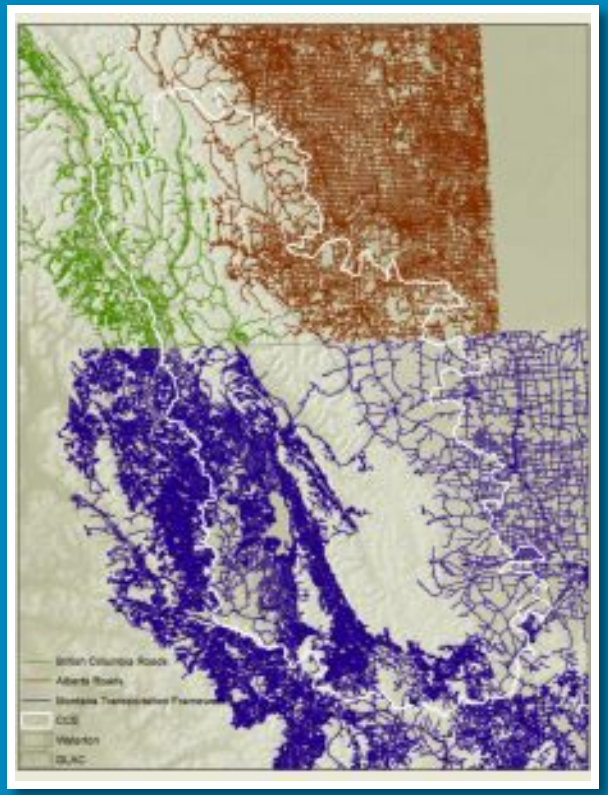
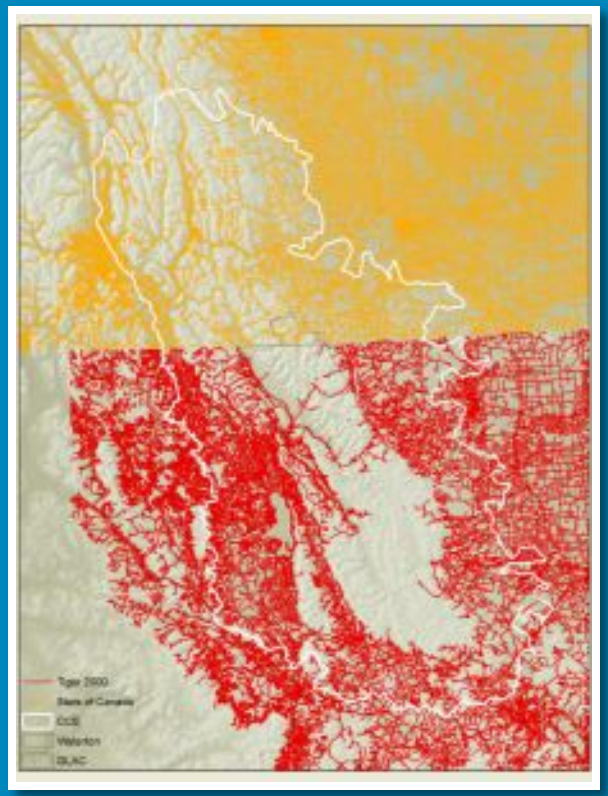
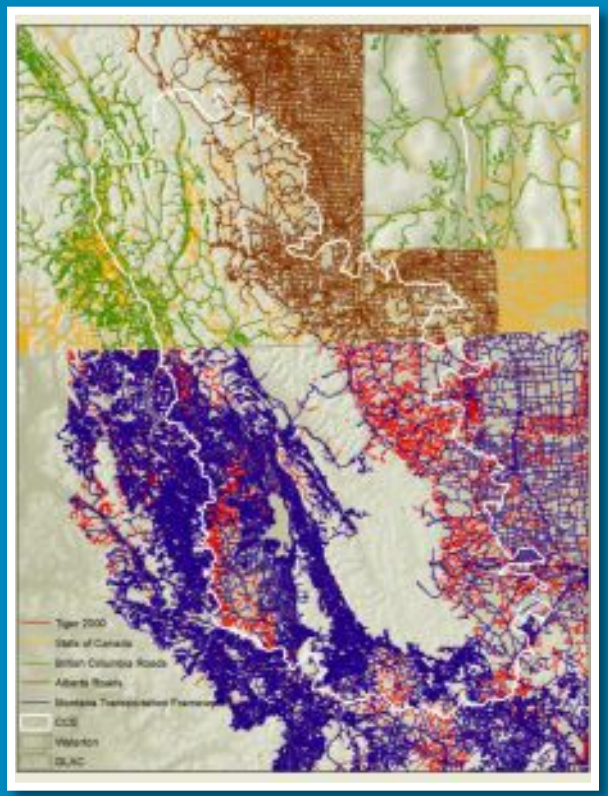
Creating a roads layer



State and Provinces Roads



Statistics and Census Roads



Comparison

Gaps

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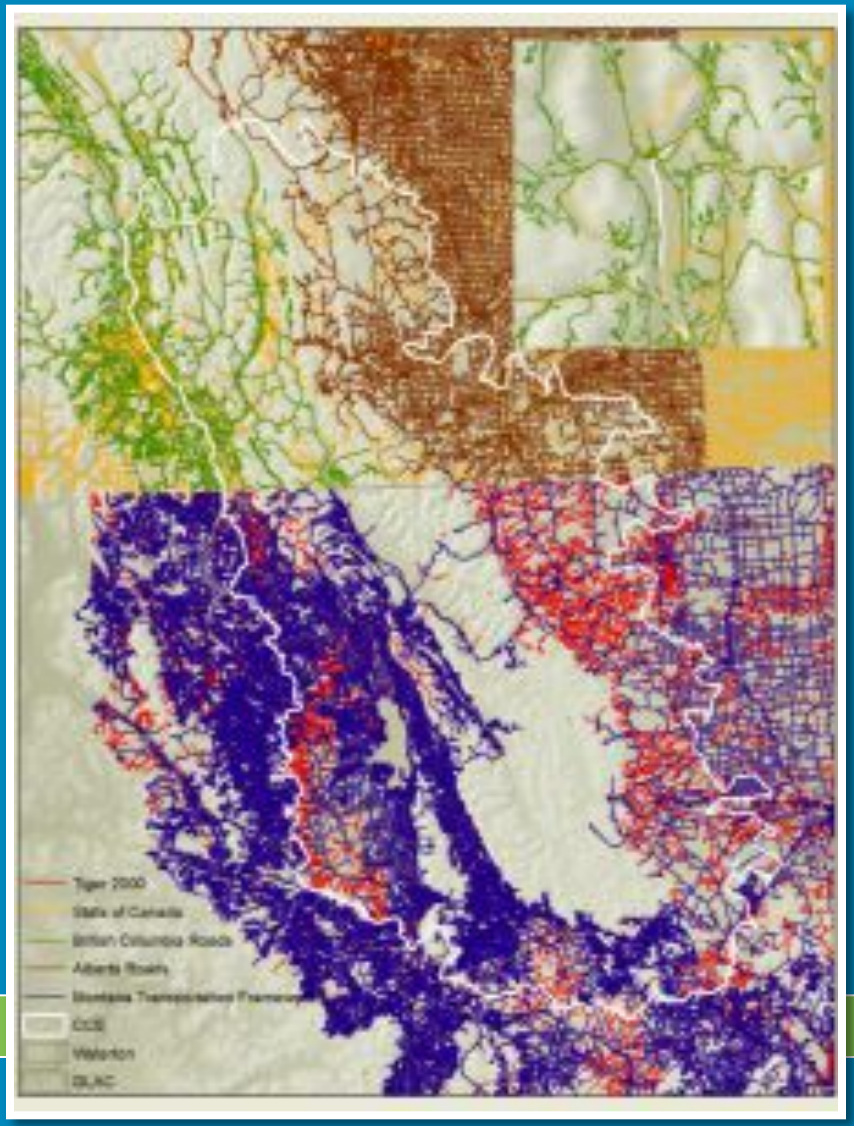
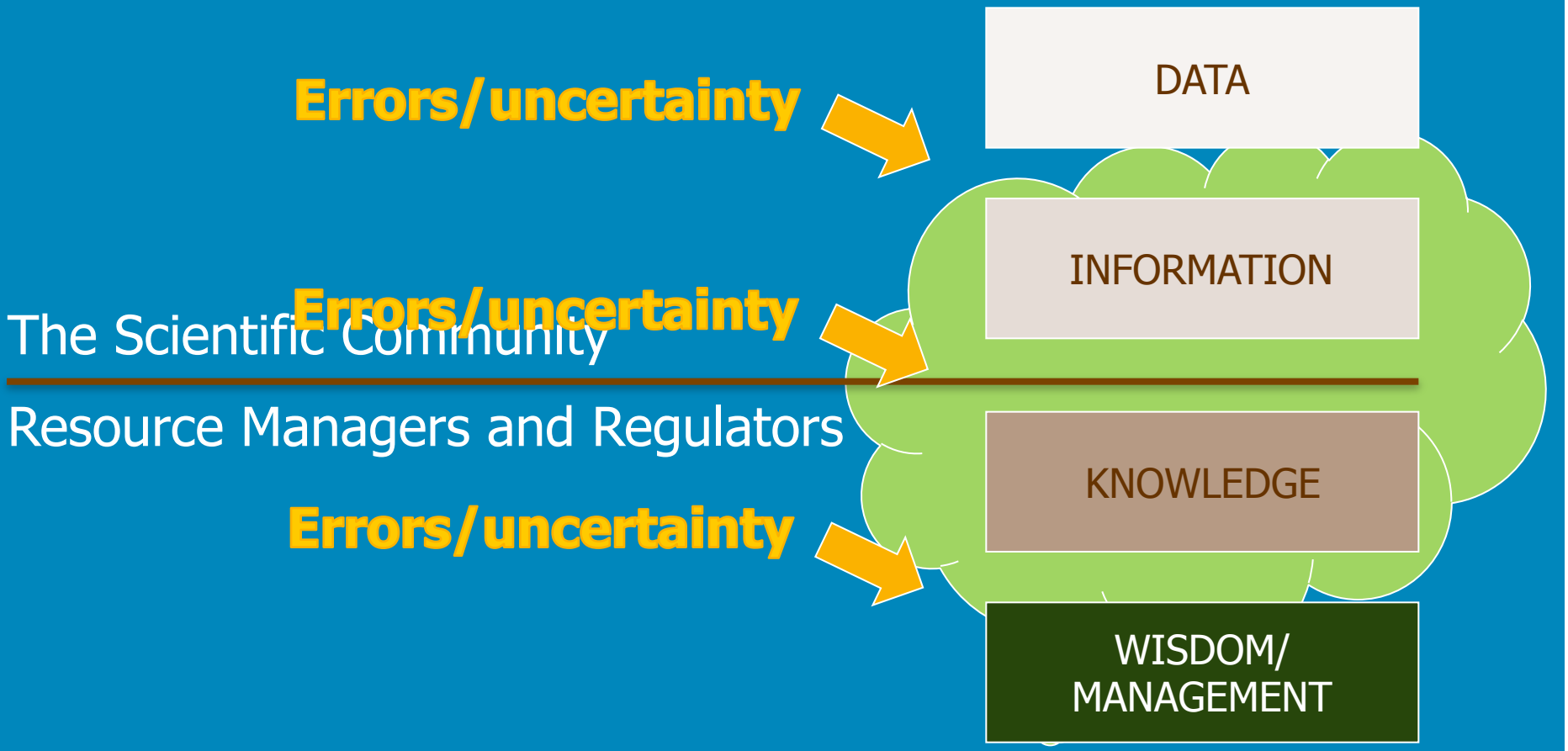
The Need for Accurate and Consistent Multi-Jurisdictional Information

- Issues surrounding geospatial data sets are significant, and often overlooked
- We require high-quality map products that are consistent, reliable, and up-to-date



Knowledge Formulation in Applied Science



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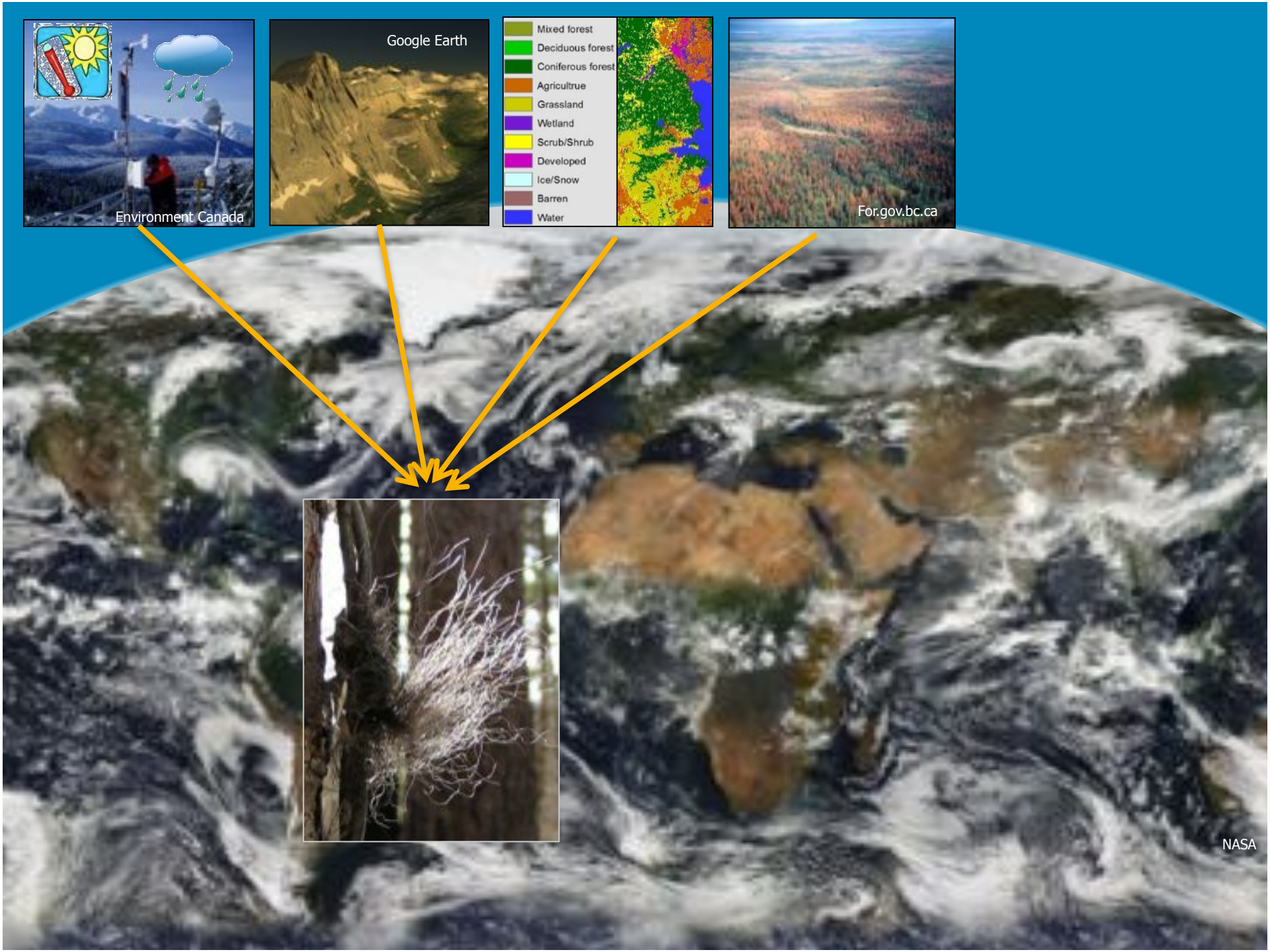
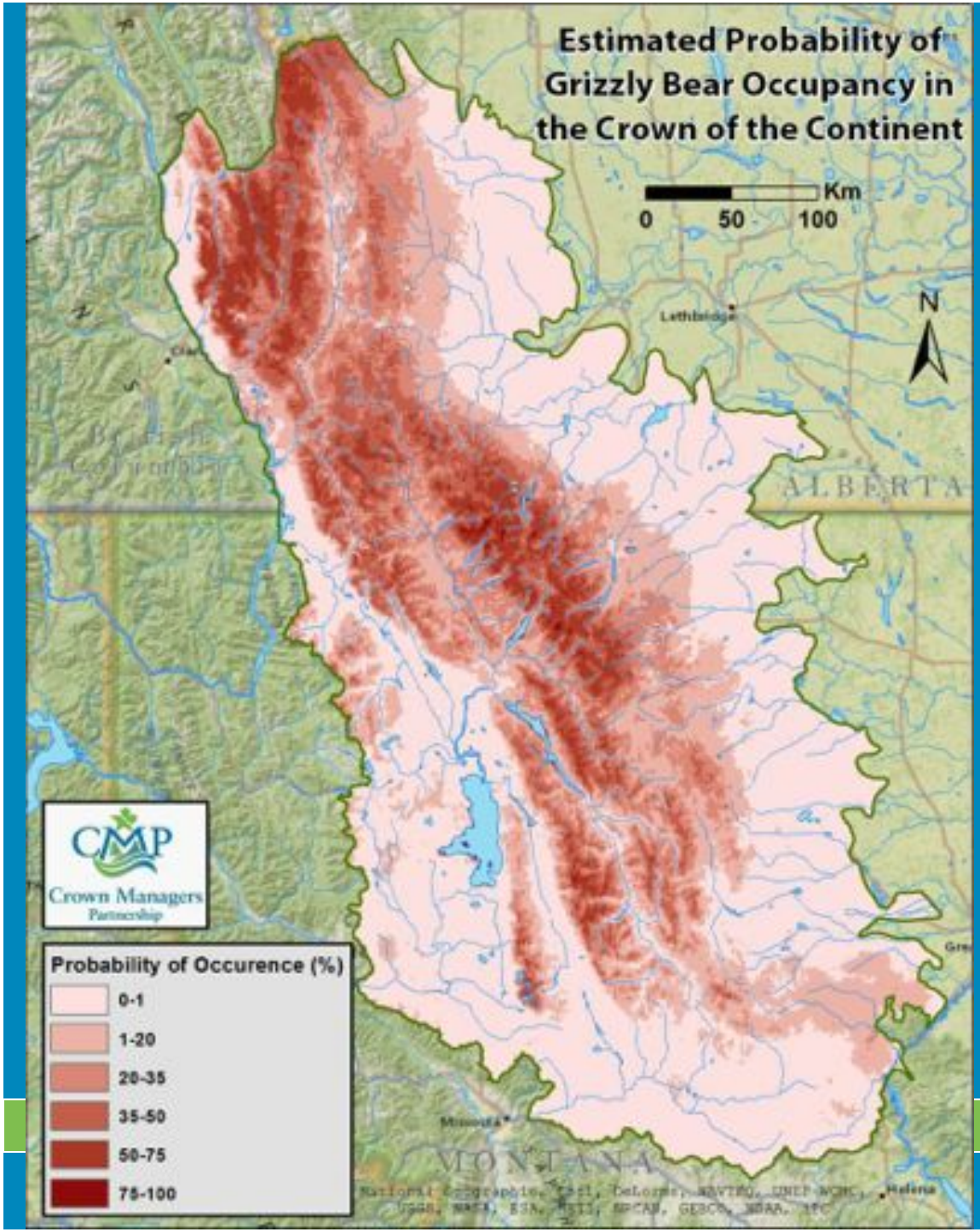
Grizzly Bears

Grizzly Bear Chair, gift to President Johnson from

- What are the local and regional factors controlling occupancy and abundance?
- What predictors should be monitored over time?
  - e.g. roads, oil/gas, mining, forestry
- What is the value of parks and protected areas?
- What is the difference between areas where we find and don't find bears
- What are potential habitat areas as grizzly bear populations expand?


Environment Canada
Google Earth
Mixed forest
Deciduous forest
Coniferous forest
Agricultrue
Grassland
Wetland
Scrub/Shrub
Developed
Ice/Snow
Barren
Water
For.gov.bc.ca
NASA



Some of our objectives:

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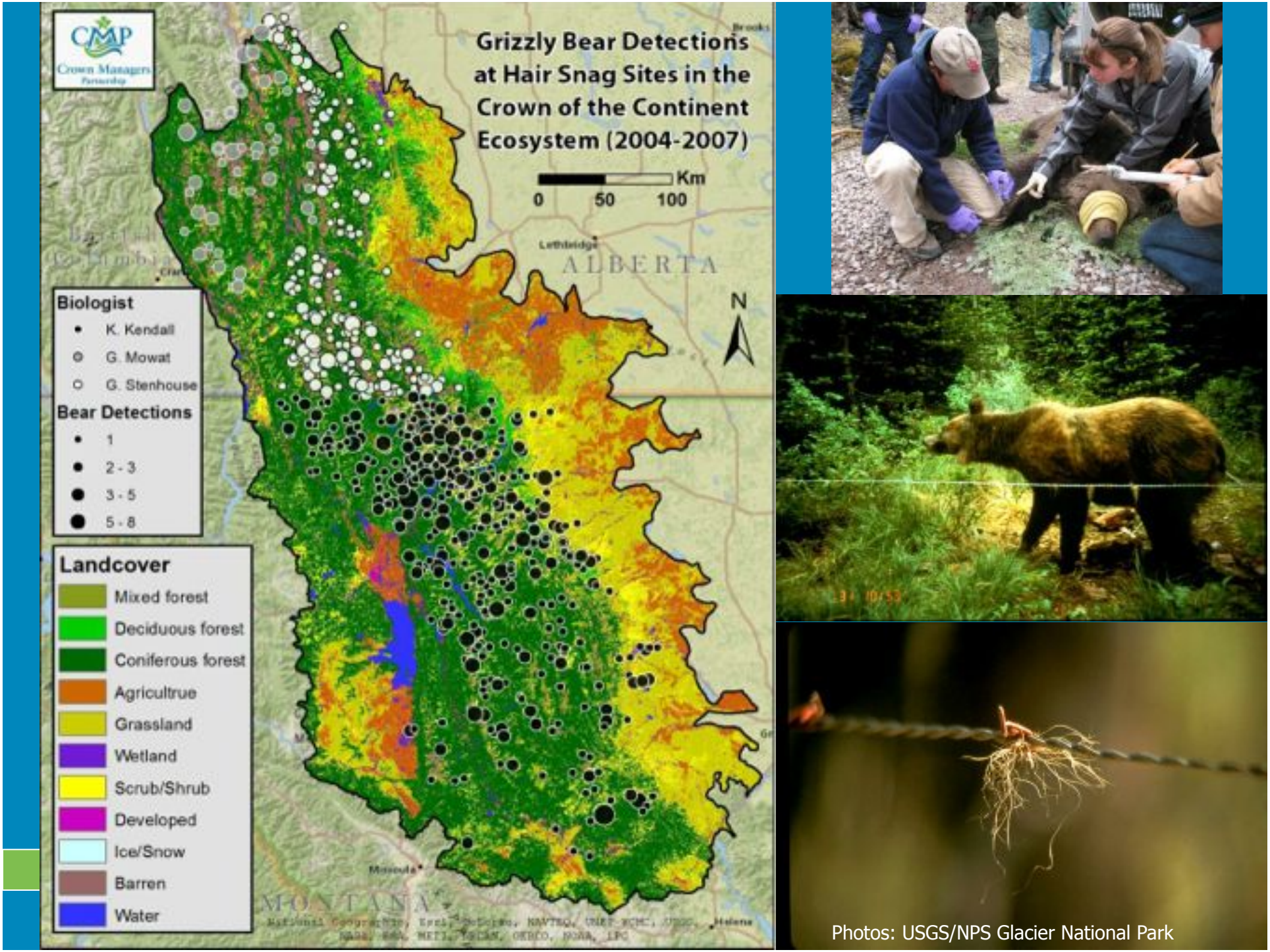
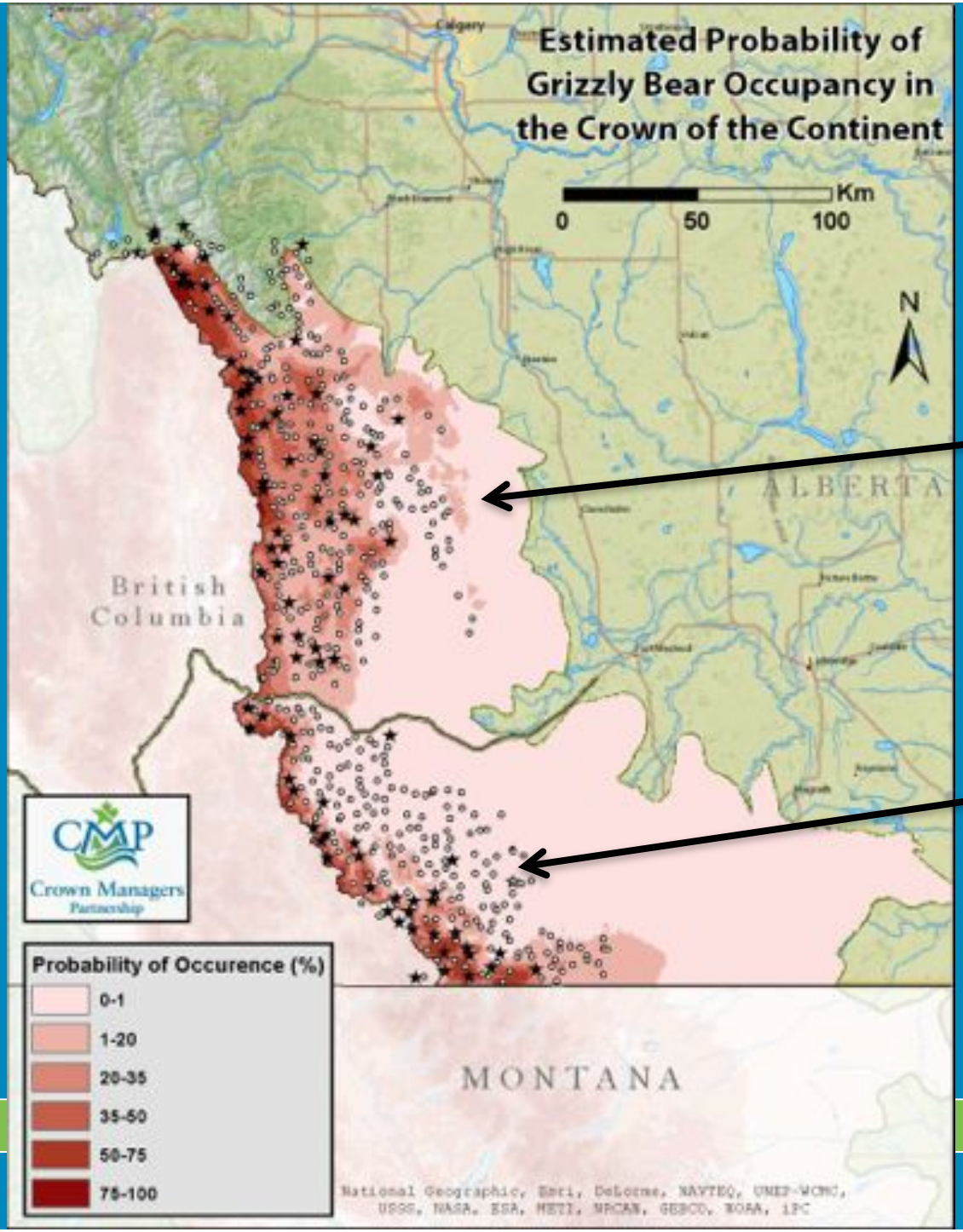

Grizzly Bear Detections at Hair Snag Sites in the Crown of the Continent Ecosystem (2004-2007)
Km
0
50
100
Lethbridge
ALBERTA
MONTANA
Missoula
Helena
N
Biologist
K. Kendall
G. Mowat
G. Stenhouse
Bear Detections
1
2 - 3
3 - 5
5 - 8
Landcover
Mixed forest
Deciduous forest
Coniferous forest
Agricultrue
Grassland
Wetland
Scrub/Shrub
Developed
Ice/Snow
Barren
Water
Photos: USGS/NPS Glacier National Park



Factors controlling local and regional abundance

- Vegetation (NDVI)
- Density of wells

- Mean Temperature
- Mean Precipitation
- Terrain Roughness
- Net Primary Productivity
- Protected Areas
- Human Population Density
- Distance to Highway

- Density of riparian habitat
- **Mean temperature**
- **Distance to pine beetle disturbance**

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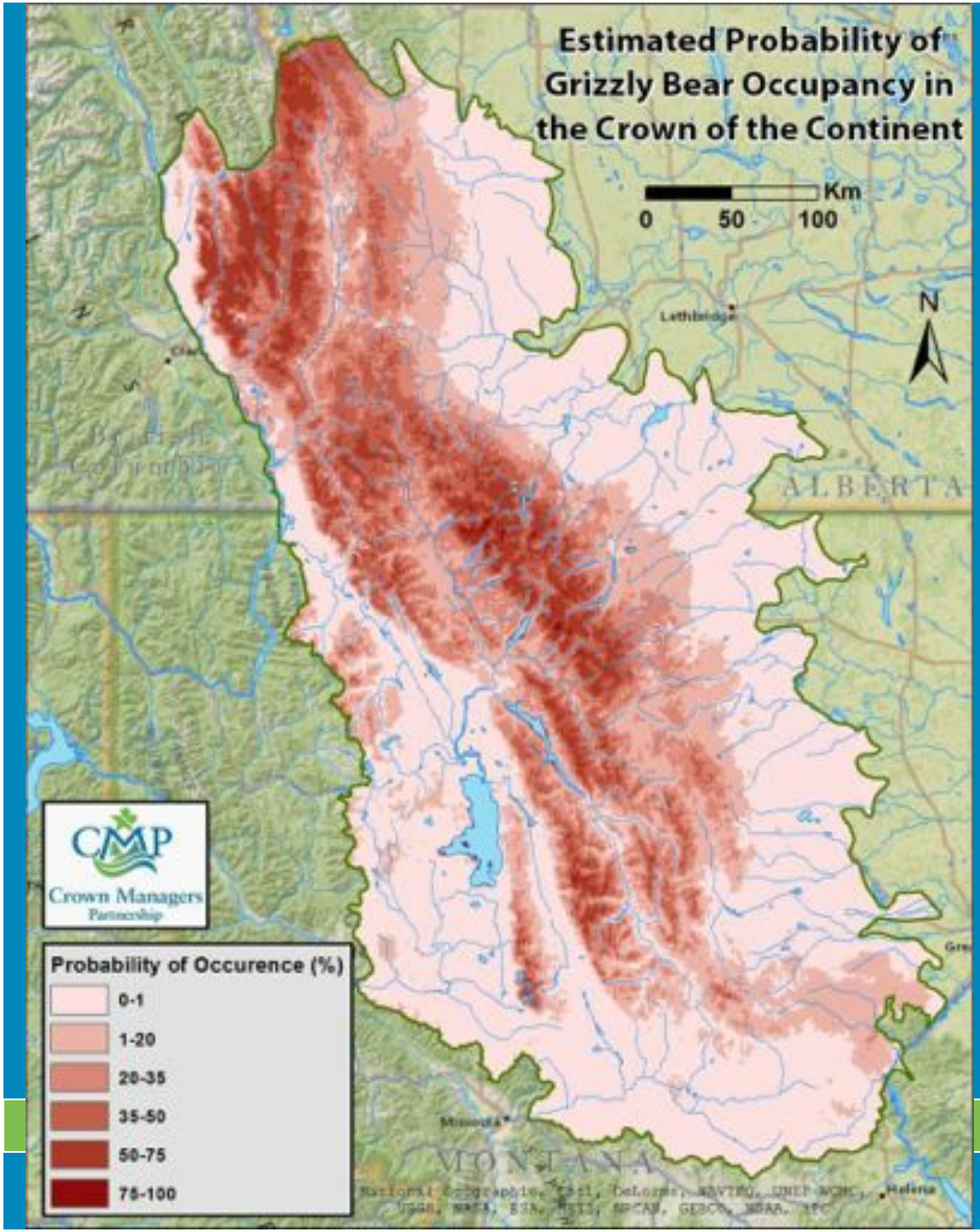

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Next steps…

- Moving through time: trend analysis
- Expanding our collaborations: terrestrial and aquatic invasives
- Other species

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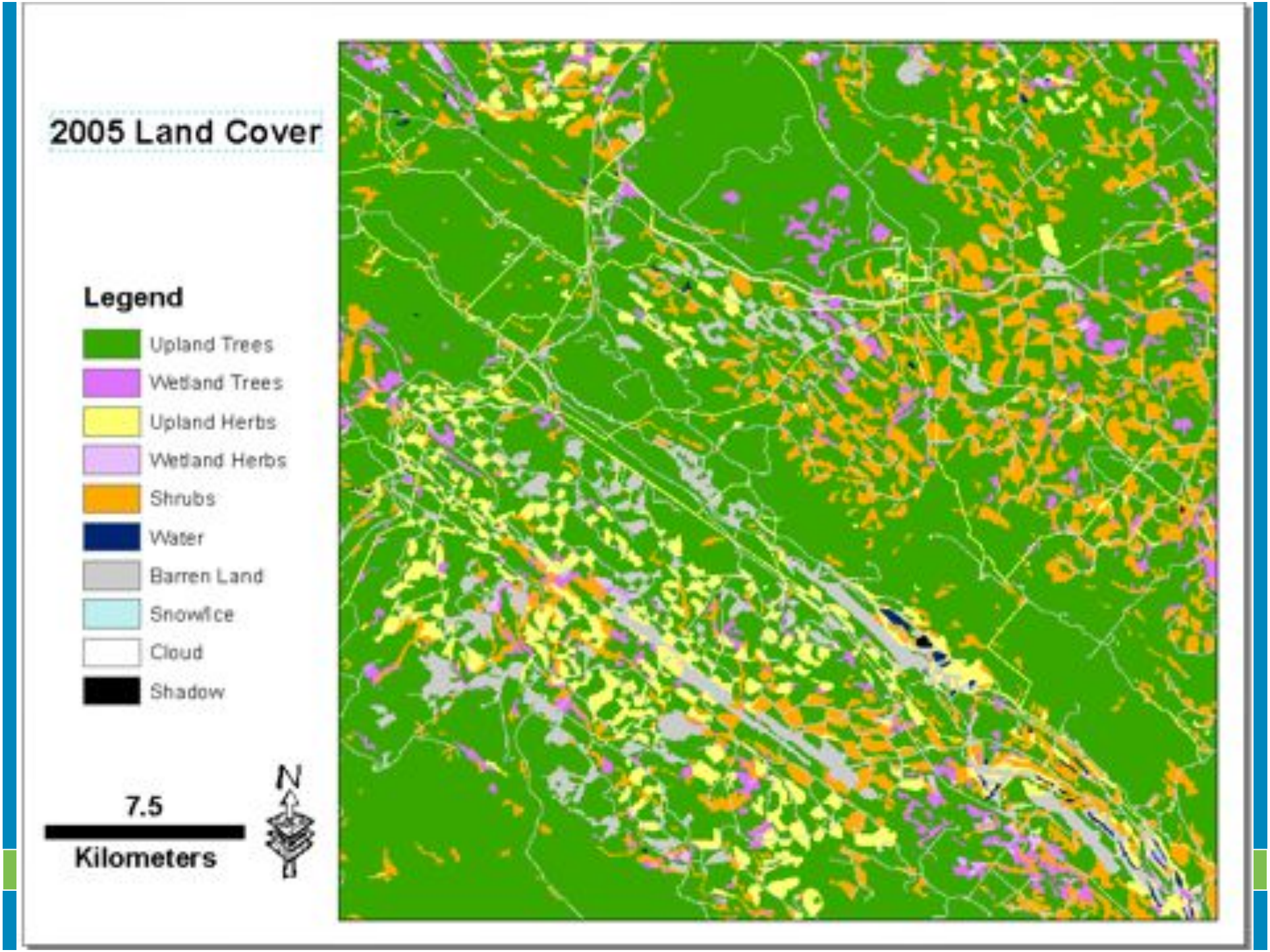
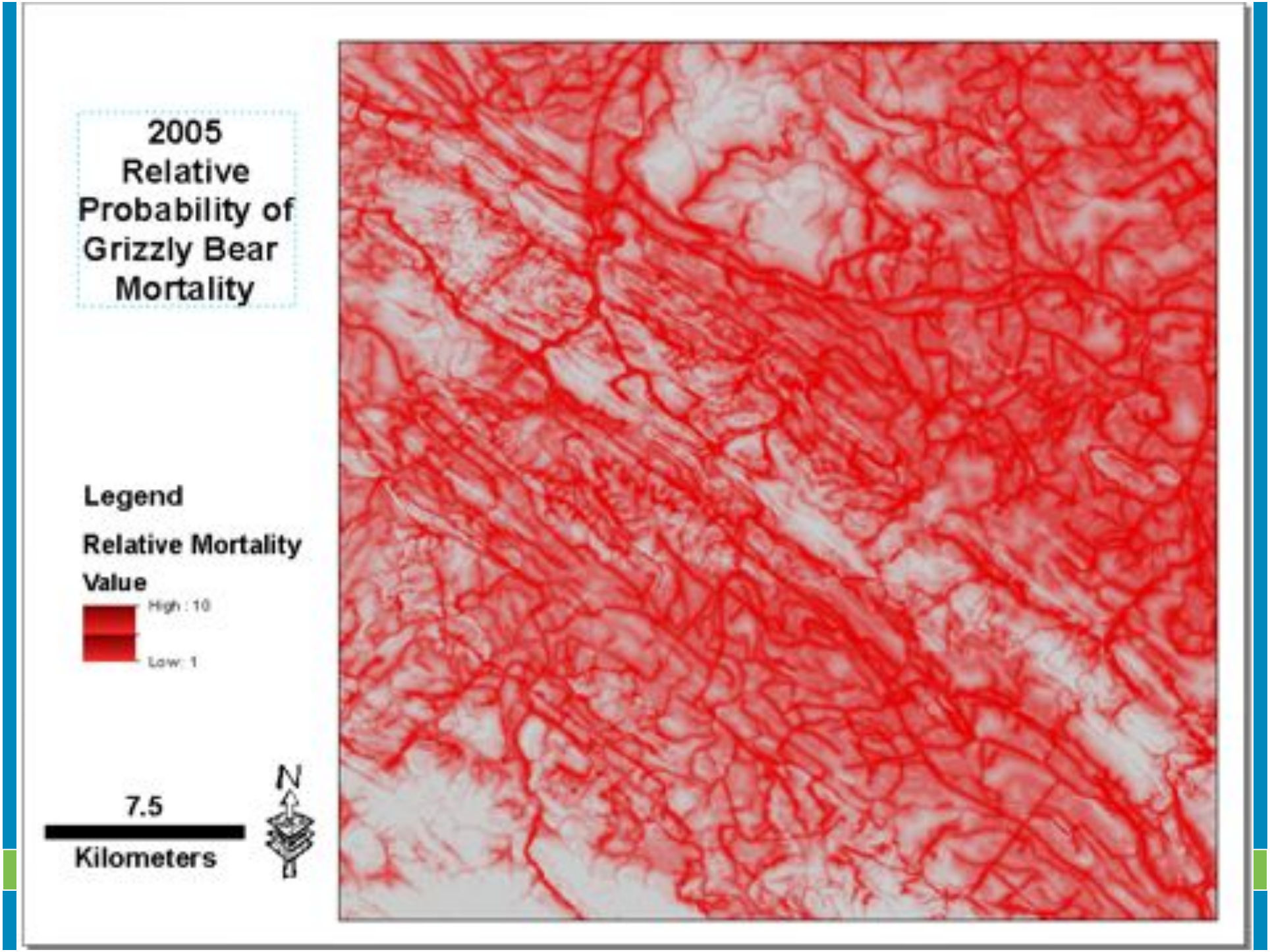

2005 Land Cover
Legend
Upland Trees
Wetland Trees
Upland Herbs
Wetland Herbs
Shrubs
Water
Barren Land
Snow/Ice
Cloud
Shadow
7.5
Kilometers
N


2005
Relative
Probability of
Grizzly Bear
Mortality
Legend
Relative Mortality
Value
High : 10
Low: 1
7.5
Kilometers
N

The End

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