WHAT IS A GOOD MAP?

What is a Good Map?

Session Objectives:
At the conclusion of this session, you will be able to:

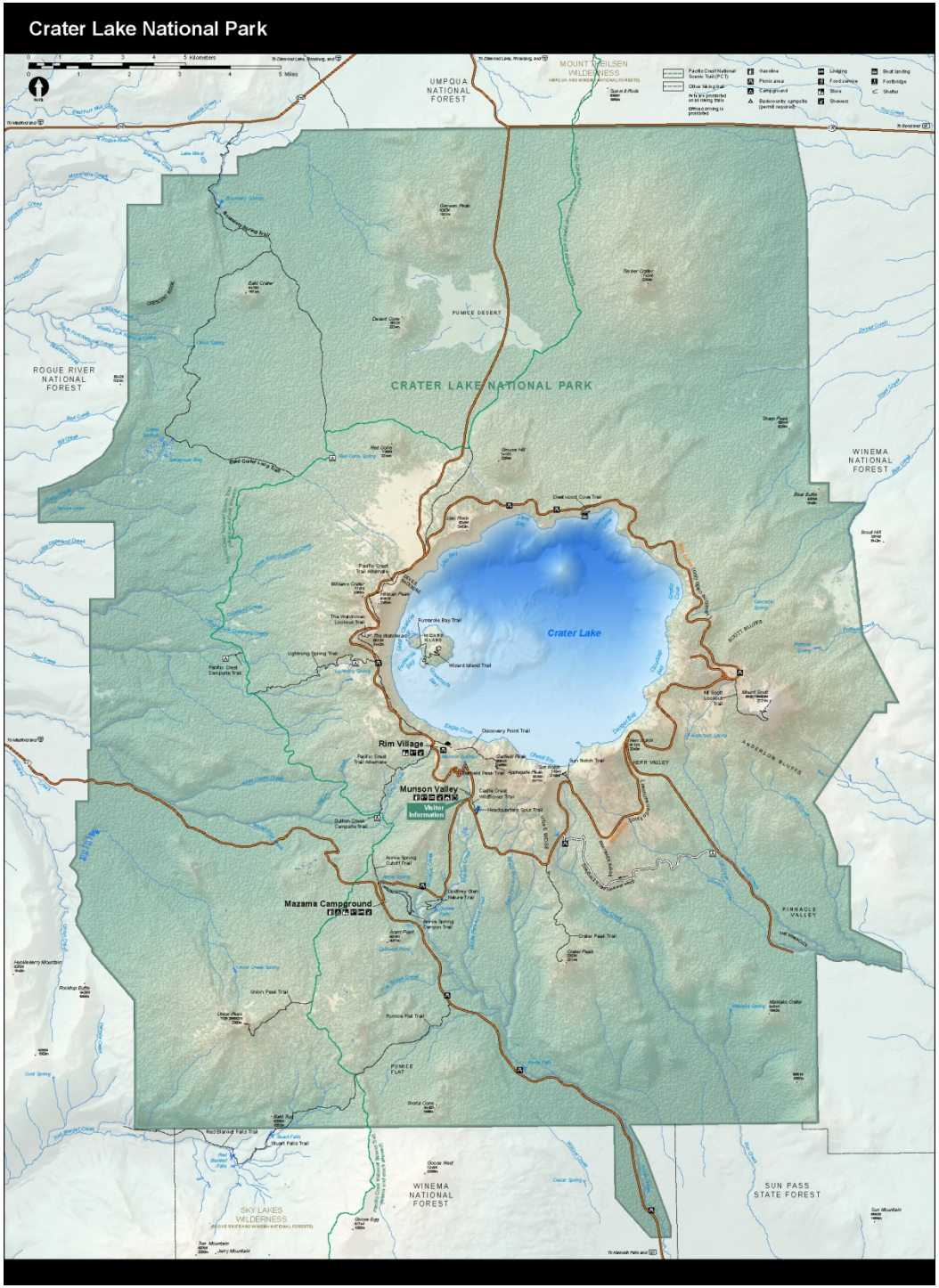
- Critique maps and understand the elements of good design

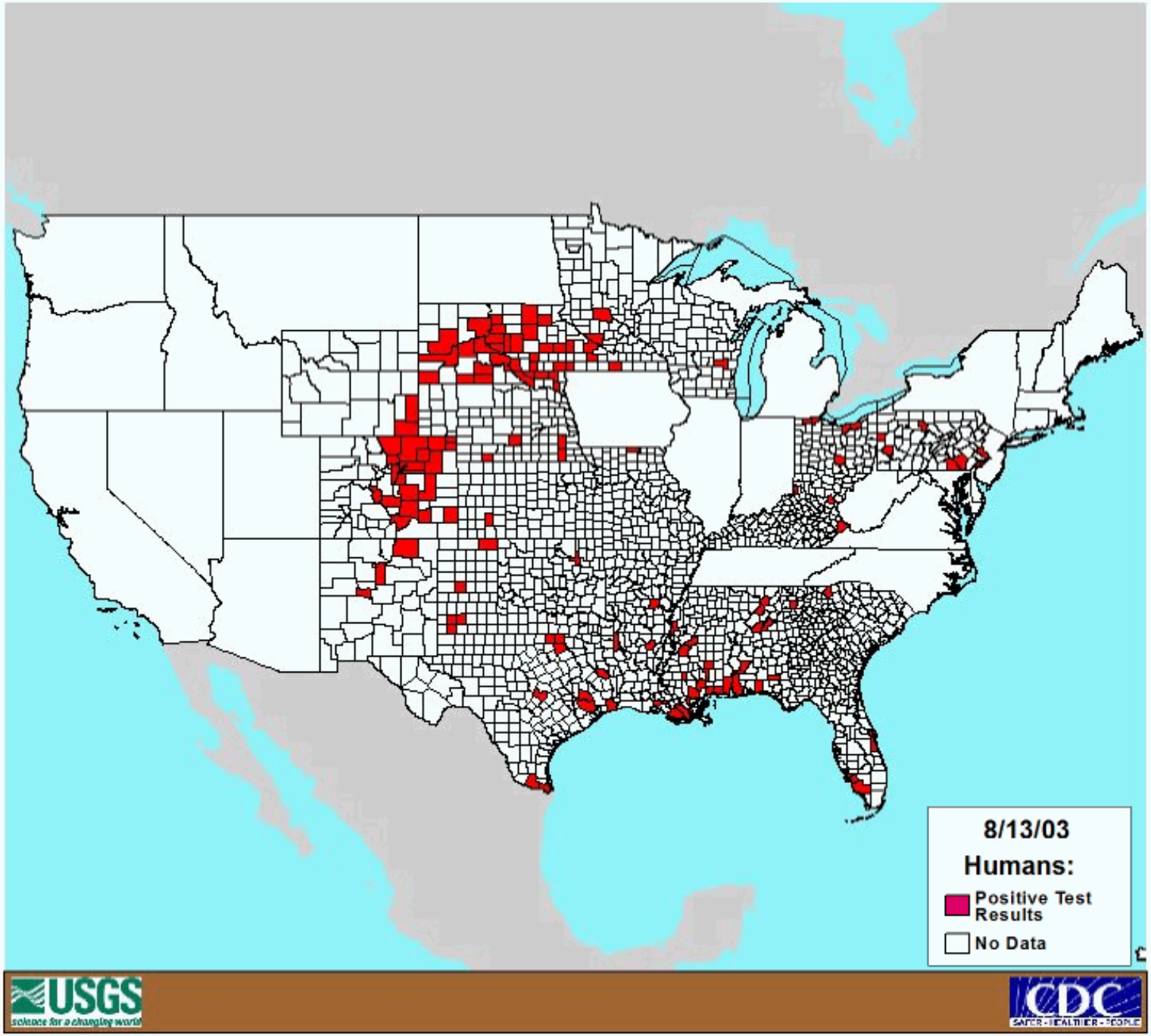
"I don't know much about cartography, but I know what I like."

A good map is...

- accurate ?
- current ?
- topical ?
- aesthetic ?
- timely ?
- relevant ?
- informative ?
- all the above ?

Crater Lake National Park



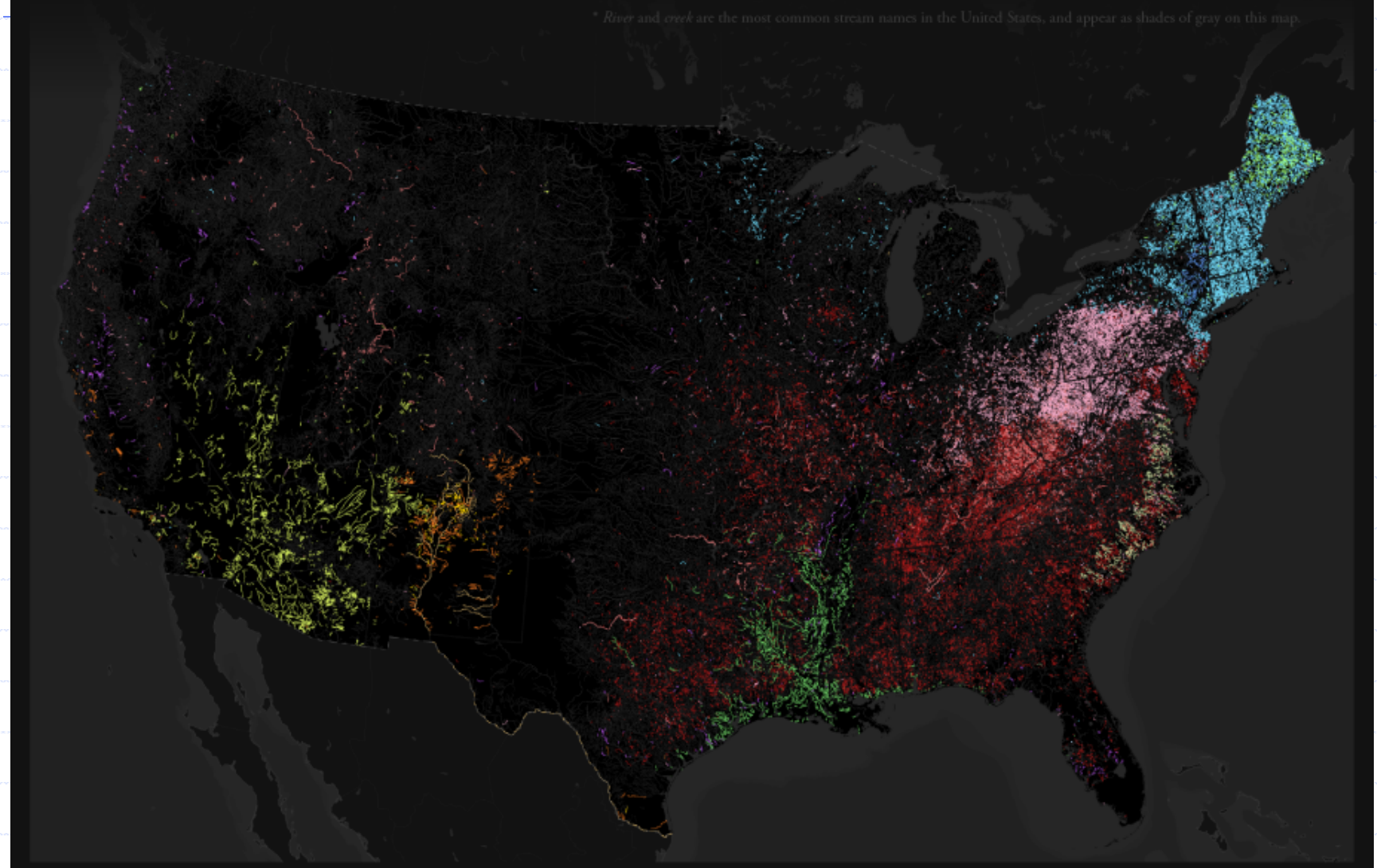

8/13/03
Humans:
Positive Test Results
No Data
USGS
science for a changing world
CDC

MAPPING GENERIC TERMS FOR STREAMS IN THE CONTIGUOUS UNITED STATES

Toponyms, or the names given to places, carry cultural information in their etymology and patterns of use. Generic toponyms, used to describe a general type of feature such as a *lake* or *pond*, tend to change more slowly than specific names. This map shows the distribution of the most popular* generic toponyms for streams in the United States. These names vary widely across America in their etymological roots, the types of features they refer to, and their cultural patterns of use. These variations reflect the interplay of cultural and physical factors that have influenced naming practices across the country.

BRANCH RUN FORK BROOK KILL STREAM BAYOU SWAMP SLOUGH WASH CAÑADA ARROYO RIO

* *River* and *creek* are the most common stream names in the United States, and appear as shades of gray on this map.



nationalatlas.gov
Where We Are

WEST NILE VIRUS

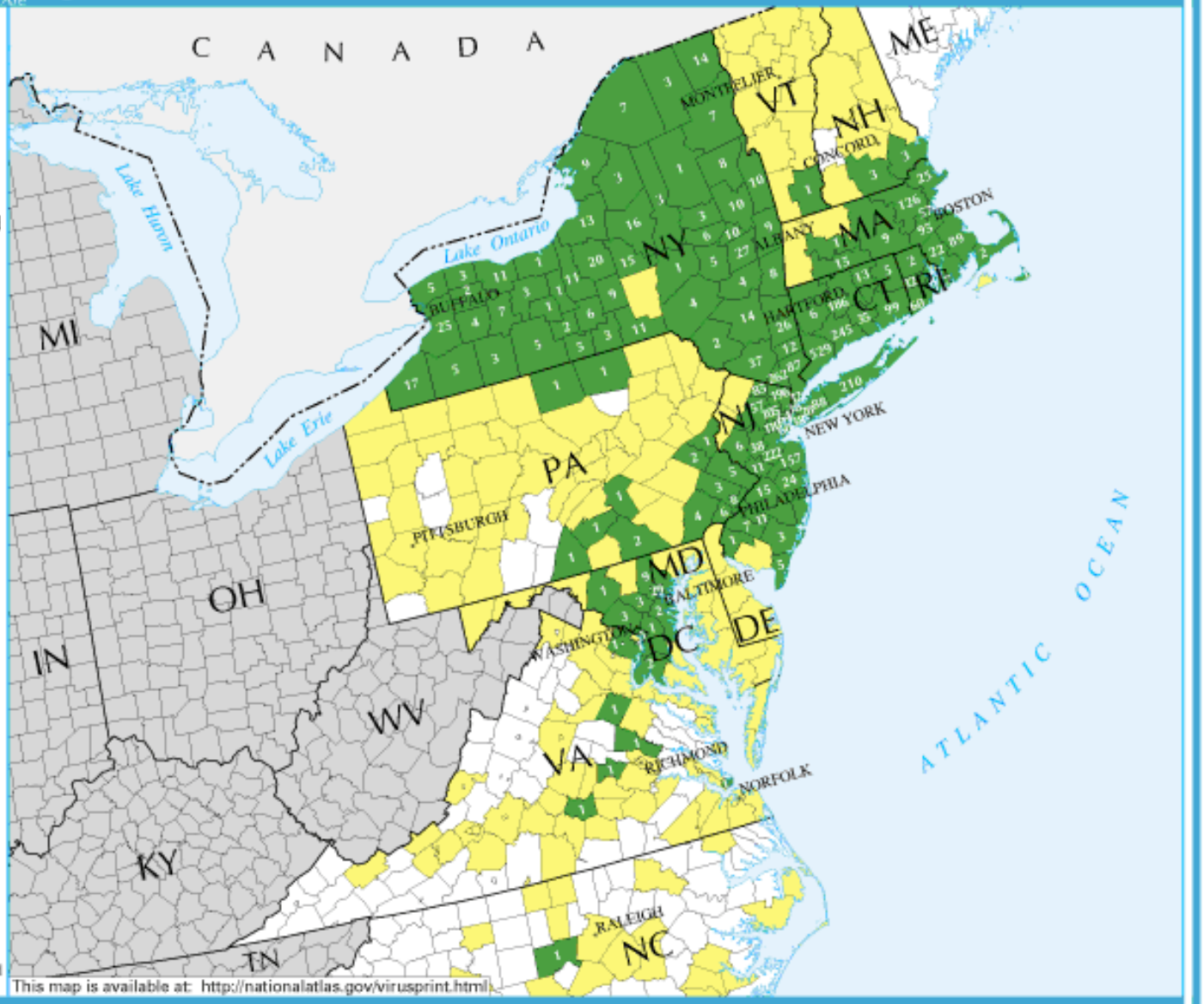
Wild Bird Cases: Cumulative Report

Data from reports made between 1 JAN 00 and 8 DEC 00.

- 1 — Number of Positives
- Test Samples Submitted
- No Reports
- Not Participating

These county and county equivalent data are based on tests of tissue samples from dead and diseased wild birds, provided by state health officials. Many of these data represent crows, which are especially sensitive to West Nile virus (WNV). Note that the map includes all areas of positive (confirmed or probable) WNV results, but not necessarily all areas with submitted samples or no reports.

Disclaimer: These data are provisional and may be revised or adjusted in the future.



This map is available at: http://nationalatlas.gov/virusprint.html

U.S. Department of the Interior
U.S. Geological Survey

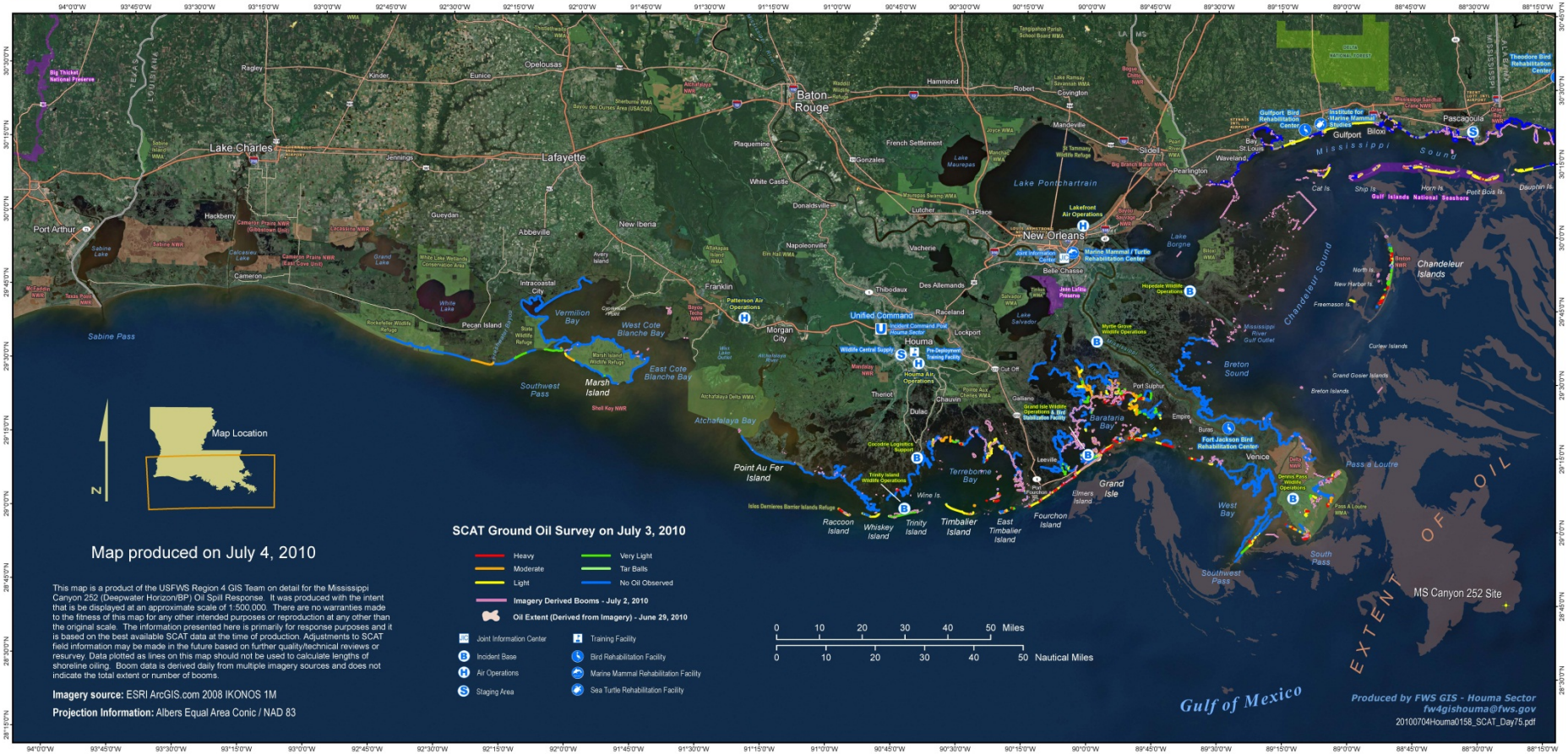
U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

The National Atlas of the United States of America®

Deepwater Horizon/BP - Daily Oil Impact Assessment

DAY 75

HOUMA SECTOR

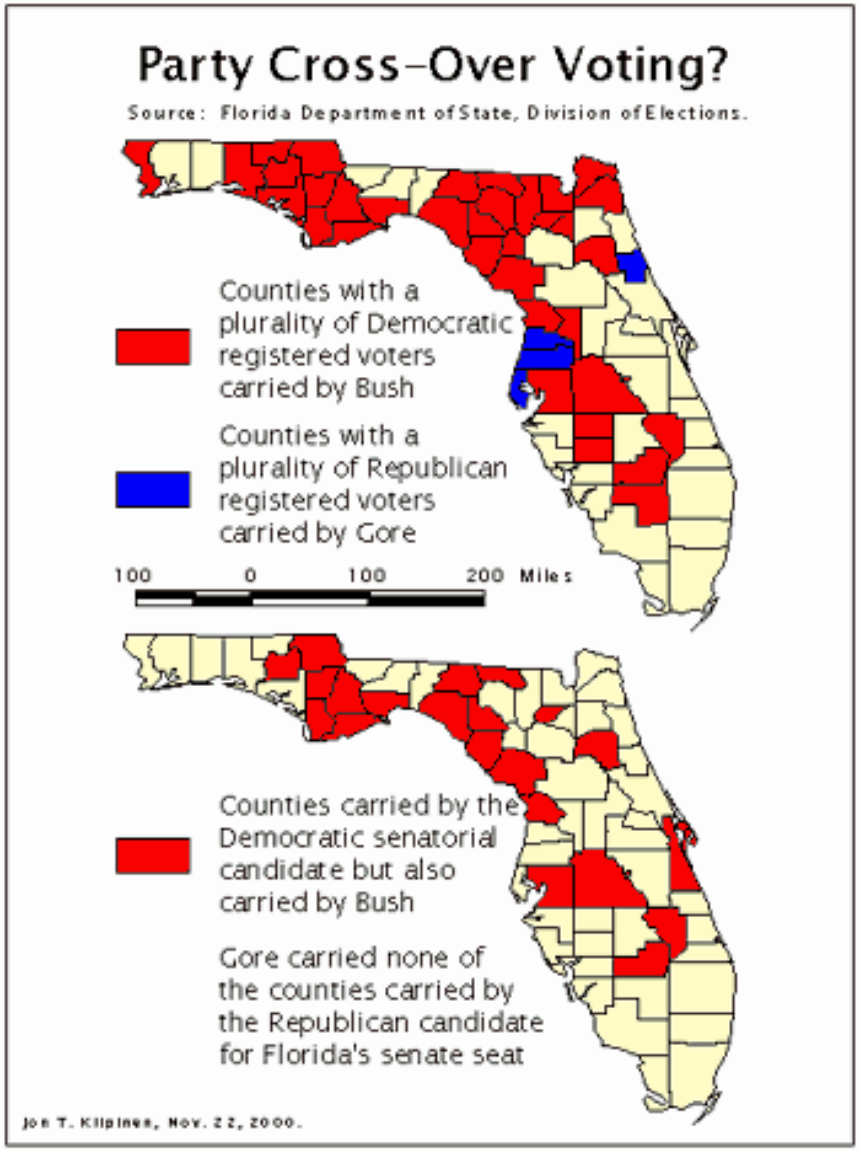


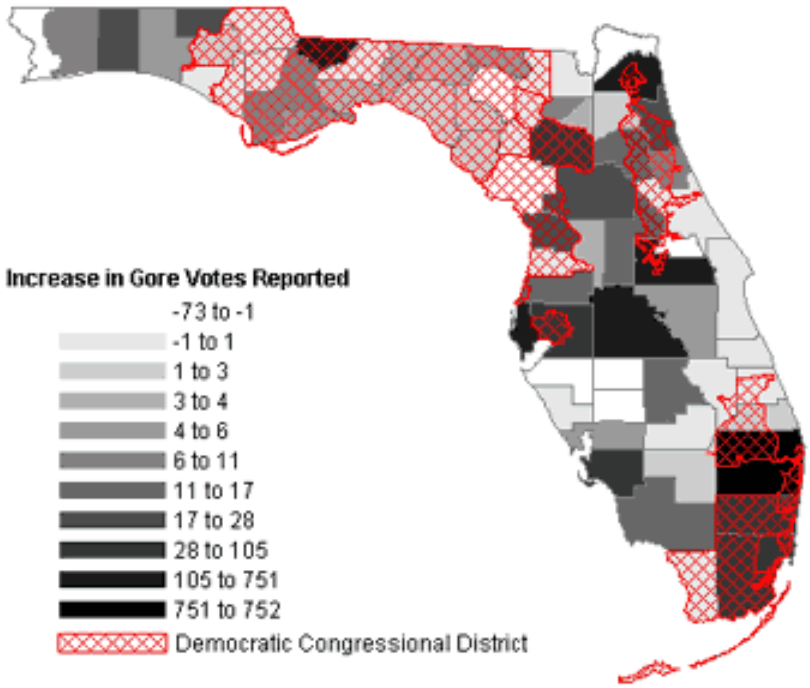
Map produced on July 4, 2010

This map is a product of the USFWS Region 4 GIS Team on detail for the Mississippi Canyon 252 (Deepwater Horizon/BP) Oil Spill Response. It was produced with the intent that is be displayed at an approximate scale of 1:500,000. There are no warranties made to the fitness of this map for any other intended purposes or reproduction at any other than the original scale. The information presented here is primarily for response purposes and it is based on the best available SCAT data at the time of production. Adjustments to SCAT field information may be made in the future based on further quality/technical reviews or resurvey. Data plotted as lines on this map should not be used to calculate lengths of shoreline oiling. Boom data is derived daily from multiple imagery sources and does not indicate the total extent or number of booms.

Imagery source: ESRI ArcGIS.com 2008 IKONOS 1M

Projection Information: Albers Equal Area Conic / NAD 83


Party Cross-Over Voting?
Source: Florida Department of State, Division of Elections.
Counties with a plurality of Democratic registered voters carried by Bush
Counties with a plurality of Republican registered voters carried by Gore
100 0 100 200 Miles
Counties carried by the Democratic senatorial candidate but also carried by Bush
Gore carried none of the counties carried by the Republican candidate for Florida's senate seat
Jon T. Klipinea, Nov. 22, 2000.


Increase in Gore Votes Reported
-73 to -1
-1 to 1
1 to 3
3 to 4
4 to 6
6 to 11
11 to 17
17 to 28
28 to 105
105 to 751
751 to 752
Democratic Congressional District


THE ESSENTIAL GEOGRAPHY OF
THE UNITED STATES OF AMERICA
LA GEOGRAFÍA ESENCIAL DE LOS ESTADOS UNIDOS DE AMÉRICA – LES ÉLÉMENTS FONDAMENTAUX DE LA GÉOGRAPHIE DES ÉTATS-UNIS D'AMÉRIQUE
USA
C A N A D A
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
MANITOBA
ONTARIO
QUÉBEC
NEW BRUNSWICK
WASHINGTON
OREGON
CALIFORNIA
NEVADA
IDAHO
MONTANA
WYOMING
UTAH
COLORADO
ARIZONA
NEW MEXICO
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
MINNESOTA
IOWA
MISSOURI
ARKANSAS
LOUISIANA
WISCONSIN
ILLINOIS
MICHIGAN
INDIANA
OHIO
KENTUCKY
TENNESSEE
MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
SOUTH CAROLINA
NORTH CAROLINA
VIRGINIA
WEST VIRGINIA
PENNSYLVANIA
NEW YORK
NEW JERSEY
MAINE
P A C I F I C   O C E A N
ATLANTIC OCEAN
Gulf of Mexico
MÉXICO
SONORA
CHIHUAHUA
COAHUILA
NUEVO LEÓN
TAMAULIPAS
BAHAMAS
CUBA
LA HABANA
WEST INDIES
LOS ANGELES
SAN DIEGO
TIJUANA
PHOENIX
DALLAS
HOUSTON
SAN ANTONIO
CHICAGO
NEW YORK
RUSSIA
ALASKA
CANADA
ARCTIC OCEAN
HAWAI'I
PACIFIC OCEAN
The United States of America and Outlying Areas

Bigfoot Sightings In the Pacific Northwest

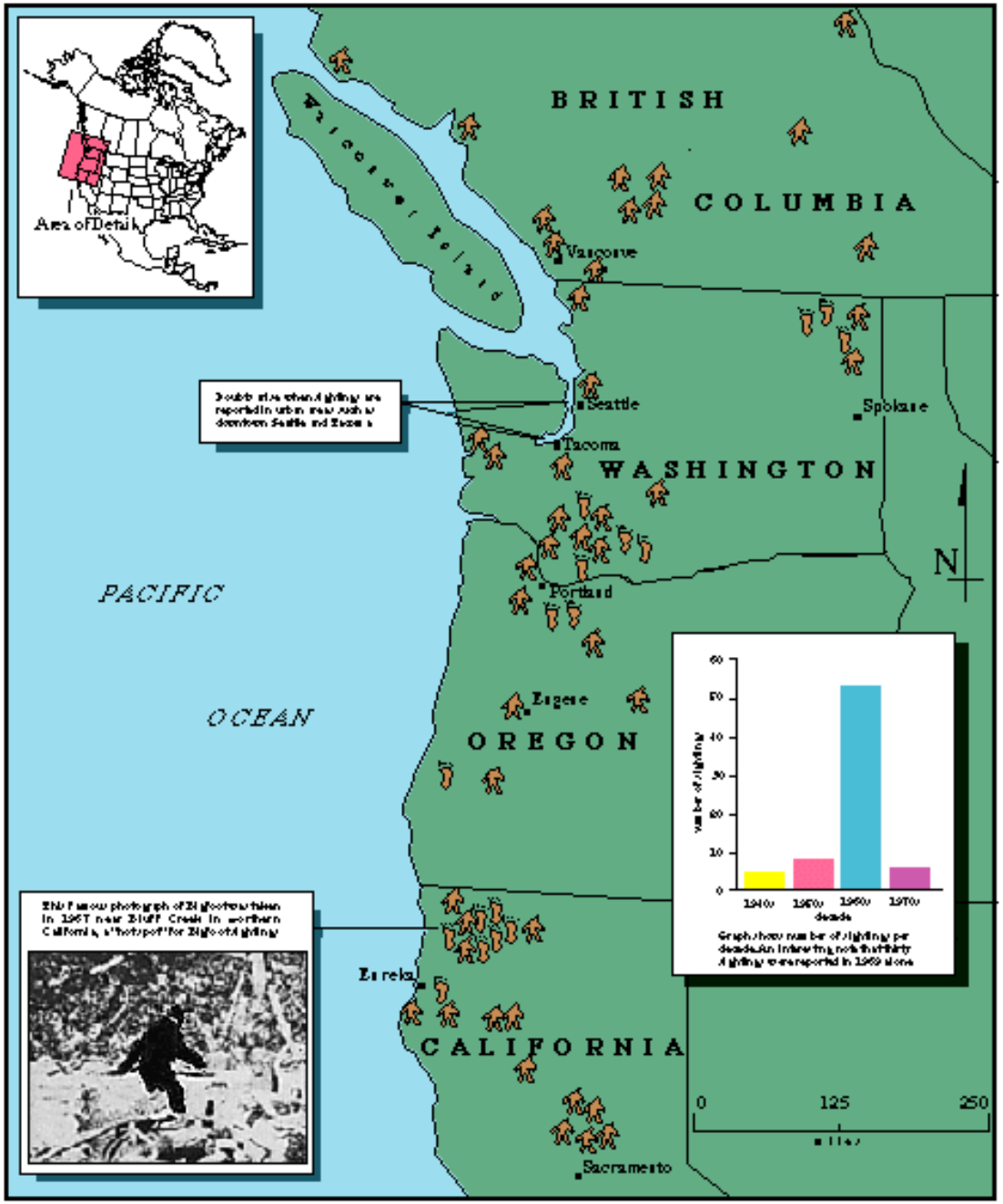
LEGEND

- Location of Bigfoot Sightings
- Location of Suspected Bigfoot Footprints
- Major Cities

Is Bigfoot Real ?

Man has an insatiable desire for myth, legend and the supernatural. In North American folklore this desire is manifest in bigfoot, also known as Sasquatch. Other cultures such as the Tibetan people in the Himalayan mountains have a similar legend, the Yeti, or the Abominable Snowman. Although both Bigfoot and the Yeti are different in their described characteristics, both are said to possess a human like appearance. Even if Bigfoot is never proven to exist in reality, it will forever live in folklore and legend.

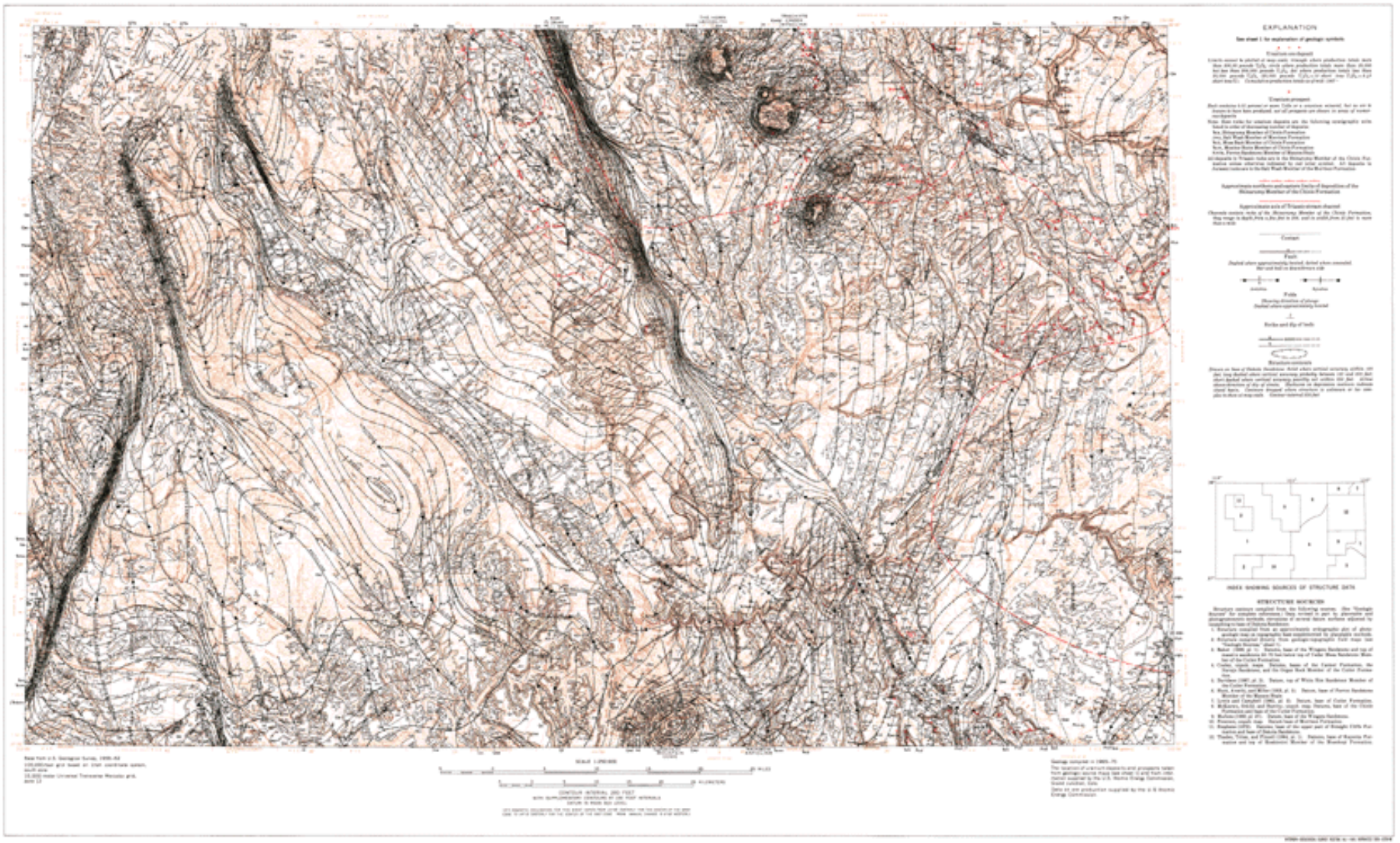
Left: Photograph of an orangutan showing remarkable resemblance to the human description of Bigfoot



DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
U.S. ATOMIC ENERGY COMMISSION

MISCELLANEOUS GEOLOGIC INVESTIGATIONS
MAP I-744 (SHEET 2 OF 2)



Structure and uranium deposits

GEOLOGY, STRUCTURE, AND URANIUM DEPOSITS OF THE ESCALANTE QUADRANGLE, UTAH AND ARIZONA

Compiled By
Robert J. Hackman and Donald G. Wyant

1973

Using GIS To Develop a Priority Work Area Map in Western North Carolina

Introduction

The U.S. Fish and Wildlife Service's Asheville Field Office (AFO) is responsible for reviewing for endangered species compliance for all federally authorized, funded, and permitted projects, and implementing listing and recovery activities for federally listed endangered and threatened species and candidate species of concern in Western North Carolina (WNC). These activities include conserving the habitats upon which the ecosystems these species depend, reducing impacts to these rare species and their habitats from development, and conducting education and outreach activities which support federal trust resource conservation. In an effort to prioritize the work area of the AFO and share this information with AFO constituents, we used geographic information systems to develop a work area habitat prioritization model. This model uses a wide variety of land use, land cover, and wildlife species data to rank the AFO work area landscape on a 1-10 scale based upon federal trust resource priorities of the AFO staff. The priority work area map was constructed in raster format using the Spatial Analyst extension of ArcGIS (ESRI, Redlands, CA). The pixel size used for the analysis was 30 x 30 m.

The USFWS Asheville Field Office location and work area extent

Model Construction

The data layers used as inputs in the model fell into two categories; layers beneficial to federal trust resources (beneficial layers) and layers which are a threat to federal trust resources (threat layers). All data layers were classified on a 0 – 10 scale; with 10 being of most benefit for the beneficial layers, and 10 being of greatest threat for the threat layers. A correlation analysis was run and layers significantly correlated were removed. AFO staff ranked each layer on a 1 – 10 scale based upon perceived benefit or threat to federal trust resources and an average layer rank was calculated for each layer. All layers were multiplied by it's AFO rank and summed by category (benefit or threat). The final step was to subtract the sum of the threat layers by the sum of the beneficial layers and classify the result into a 1-10 scheme. A high score indicates an area that ranked high in the beneficial layers (numerous benefits) but low in the threats layers (limited threats) and vice versa for a low score.

Threat Layers*

Dam Density – Prioritizes hydrologic subbasins (10 digit) based on the storage capacity of dams. Data from the National Inventory of Dams and the NC Dept. of Environment and Natural Resources.

Discharge Density – Prioritizes hydrologic subbasins (14 digit) by number of discharge sites and violations. Data obtained from the NC Division of Water Quality and the US Environmental Protection Agency.

Forest Insect and Disease Risk – Composite results of the USFS analysis of forest insects and disease risks on the national forests.

Mining Density – Prioritizes hydrologic subbasins (10 digit) based on mining density. Data obtained from the NC Dept. of Environment and Natural Resources and USGS Mineral Resources.

Impervious Surface Density – Identifies and prioritizes hydrologic subbasins (14 digit) by percentage of area that is an impervious surface. Data from the USGS National Land Cover Dataset.

Road Density with Traffic Volume – Ranks WNC based upon road density. Road and annual average daily traffic data obtained from the NC Dept. of Transportation.

Windpower – Ranks WNC by potential to support wind farms. Data obtained from the NC State Energy Office.

Beneficial Layers*

Aquatic Subbasin Rank – Prioritizes hydrologic subbasins based upon fish and benthic macroinvertebrate monitoring data from the NC Division of Water Quality.

Important Bird Areas – Identifies areas vital to birds and other biodiversity. Data obtained from the National Audubon Society.

Indian Lands – Identifies all lands which American Indian Tribes have the primary governmental authority.

Managed Lands – Identifies lands managed for conservation. Data obtained from the NC Dept. of Environment and Natural Resources One NC Naturally program.

Natural Lands Density – A ranking of the NC GAP landcover dataset by density of natural lands.

Wetlands – A prioritization by AFO staff of the National Wetlands Inventory dataset. Prioritization is based wetland type.

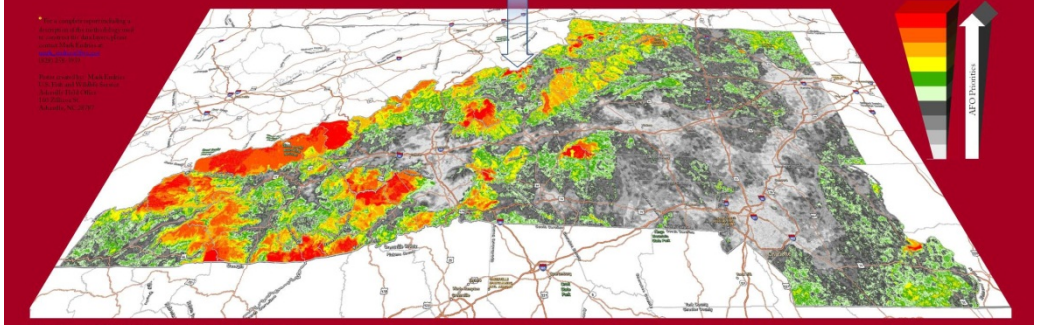
Significant Natural Heritage Areas (SNHA) – A prioritization of the NC Heritage Program SNHA dataset by listed species occurrence, rank, and diversity.

Critical Habitat – Identifies all lands designated as critical habitat by the US Fish and Wildlife Service.

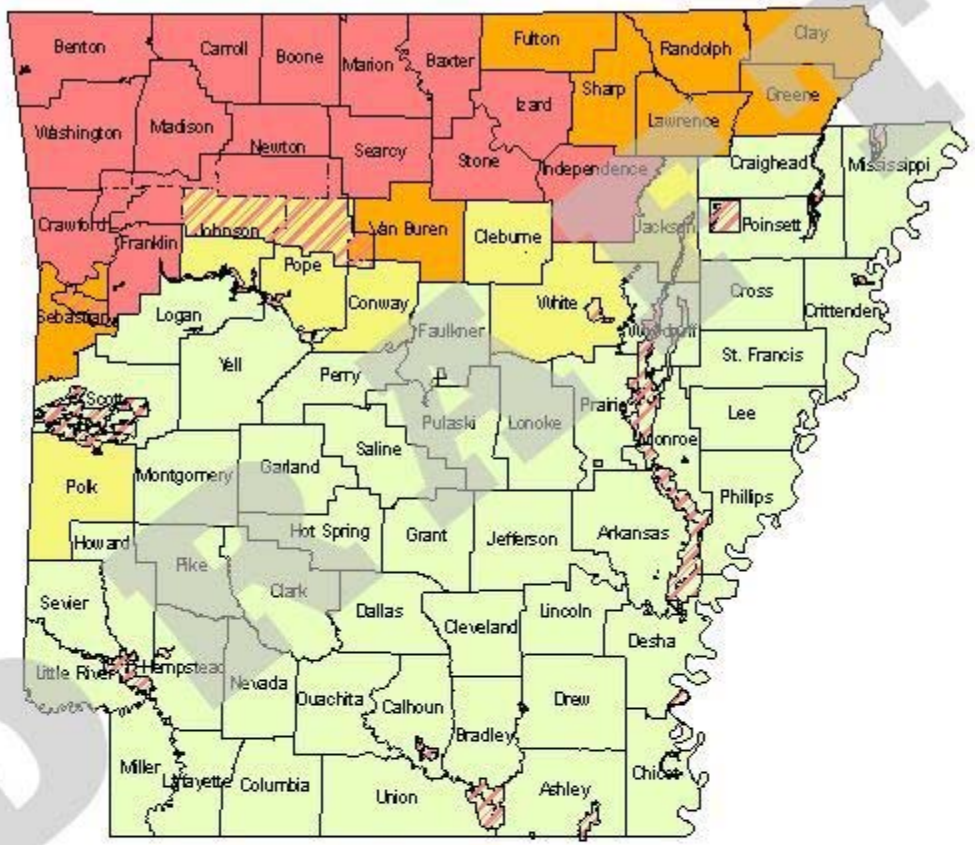
AFO Landowner Priorities – A prioritization of the NC GAP landcover habitat classes by AFO staff.

Habitat Connectivity – A prioritization of potential habitat connectivity in North Carolina. Dataset developed by the NC Wildlands Clusters project.

* For a complete description including a description of the methodology used to construct the data layers please contact Mark Endries at mark_endries@fws.gov or (828) 258-3939.



Poster created by: Mark Endries
U.S. Fish and Wildlife Service
Asheville Field Office
160 Zillicoa St.
Asheville, NC 28801



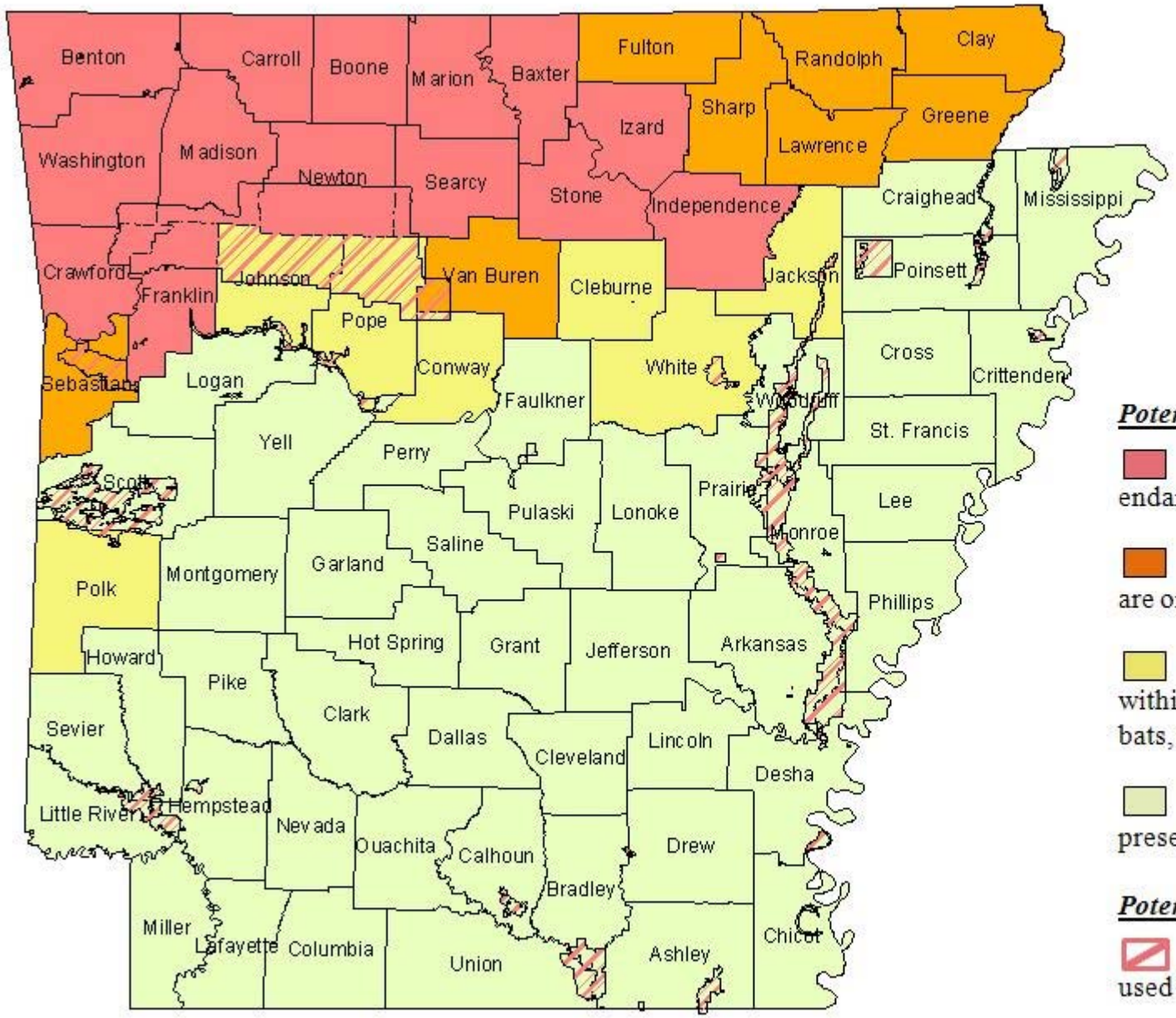
Potential Risk: BATS

	High	Important caves used by endangered bats are present in this county
	Moderate-High	Endangered bats are or have been present in this county
	Moderate	These counties are within the potential range of endangered bats, but none have been documented
	Low	No known or predicted presence of endangered bats

Potential Risk: BIRDS

	High	Important known habitat used by local and migratory birds

NOTE: The map above depicts potential risk (due to construction of wind farms) for endangered bats (by county) as wel



Potential Risk t Endangered Bat and Migratory Birds from Win Farms

***Potential* Risk: BATS**

High - Important caves used by endangered bats are present in this cou

Moderate-High - Endangered b are or have been present in this county

Moderate - These counties are within the potential range of endanger bats, but none have been documented

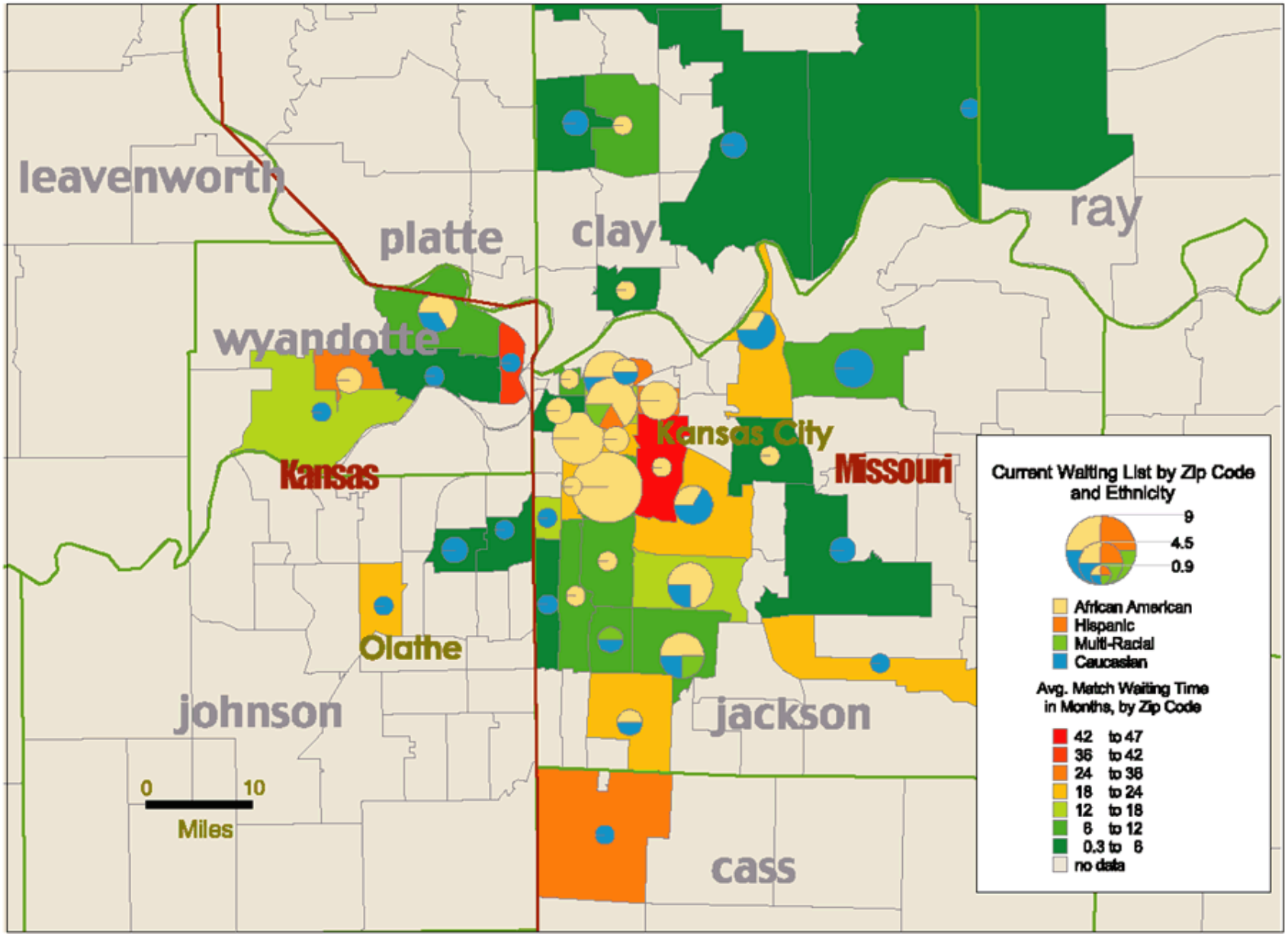
Low - No known or predicted presence of endangered bats

***Potential* Risk: BIRDS**

High - Important known habita used by local and migratory birds

NOTE: The map above depicts *potential* risk (due to construction of wind farms) for endangered bats (by county) as well as local and migratory birds (known habitat areas). Proposed construction in a high risk county or known bird use area

Big Brothers Big Sisters of the Greater Kansas City Area
Little Brother Waiting List as of March 1999




ÉTATS-UNIS
Frontière depuis 1853
Golfe de la Californie
Sierra Madre Occidental
Sierra Madre Oriental
Sierra Madre del Sur
Golfe du Mexique
Océan Pacifique
Mer des Caraïbes
Peninsula du Yucatán
Mexico
Monterrey
Puerto Vallarta
Acapulco
Veracruz
Campeche
Mérida
Cancún
Belize
Le Mexique contemporain peut être divisé en trois grandes régions : le Nord (El Norte), le Centre (El Centro) et le Sud (El Sur).
El Norte est une région aride; dans cette partie du pays, anciennement couverte d'haciendas (grandes exploitations rurales), se développent aujourd'hui des villes industrielles prospères.
El Centro, région de vallées et de montagnes densément peuplée, se caractérise depuis des temps immémoriaux par une vie culturelle, politique et économique très intense, qui s'articule autour de la ville de Mexico.
El Sur, riche en ressources naturelles, est une terre tropicale essentiellement indienne qui englobe notamment la péninsule du Yucatán.
Modern Mexico can be divided into three main cultural regions: the North (El Norte), the Centre (El Centro) and the South (El Sur).
El Norte is an arid region formerly covered with haciendas (large rural estates) where, today, industrial cities flourische.
El Centro, a densely populated region famous for its valleys and mountains, and known since time immemorial for its very intense cultural, political and economic life, lies around the city of Mexico.
El Sur, rich in natural resources, is a basically tropical Indian region which includes the Yucatán peninsula.
Axe Néovolcanique
0
200
km


Afghanistan
China
Jammu
Chandigarh
Pakistan
New Delhi
Nepal
Bhutan
Jaisalmer
Jaipur
Ghaghara
Ganges
Benares
India
Bangladesh
Okha
Narmada
Surat
Calcutta
Burma
Nagpur
Mahanadi
Mouths of the Ganges
Mumbai (Bombay)
Godavari
Bay of Bengal
Arabian Sea
Krishna
Panaji
Guntakal
Bangalore
Chennai (Madras)
Coleroon
Kavaratti
Madurai
Laccadive Sea
Sri Lanka
PBS.org

PAPAHĀNAUMOKUĀKEA
MARINE NATIONAL MONUMENT

Produced by NOAA National Marine Sanctuary Program

United States and Japanese ships sunk during the Battle of Midway, June 4-7, 1942.

Between 1996 and 2005, 294 metric tons of marine debris were removed from Pearl and Hermes Atoll, more than half of all nets and other large debris removed from the Monument's reefs.

Over 14 million seabirds nest in the Monument and many forage in the waters surrounding the breeding colonies. Laysan Island has the greatest diversity of bird species in the Monument.

During World War II, Midway served as an important naval air station and submarine refit base. The atoll was attacked twice, first on December 7th 1941, and again during the pivotal Battle of Midway, June 4-6, 1942. This Corsair is one of the remnants of military presence during WWII.

Pearl and Hermes Atoll has the highest percentage of endemic fish species of any area in the Hawaiian Archipelago. Over half of all fish recorded here are only found in Hawai'i. The masked angelfish, Genicanthus personatus, is one of these endemic species.

With approximately 250 individuals, French Frigate Shoals has the largest Hawaiian monk seal colony in the Monument.

Over 90% of all green sea turtle nesting in the Hawaiian Archipelago occurs at French Frigate Shoals.

A large number of archaeological features on the islands of Nihoa and Mokumanamana attest to early Native Hawaiian presence in the region. Both islands are on the National Register of Historic Places.

Kilometers: 0, 200, 400
Statute Miles: 0, 100, 200, 300

Relative Biogeographic Comparison

Data Classified as Quantiles, Equal Interval and Weighting, 2006

	Endemic Fish %	Biomass Tons per Hectare	Coral Cover %	Fish Species #
Nihoa	20	0.4	12	127
Mokumanamanamt	35	0.5	14	125
FFS	46	0.8	15	178
Gardner	36	1.0	7	124
Maro	49	0.8	64	142
Laysan	41	1.0	22	131
Lisianski	58	1.0	53	124
Pearl & Hermes	72	0.9	13	174
Midway	54	0.3	10	163
Kure	56	0.1	14	155

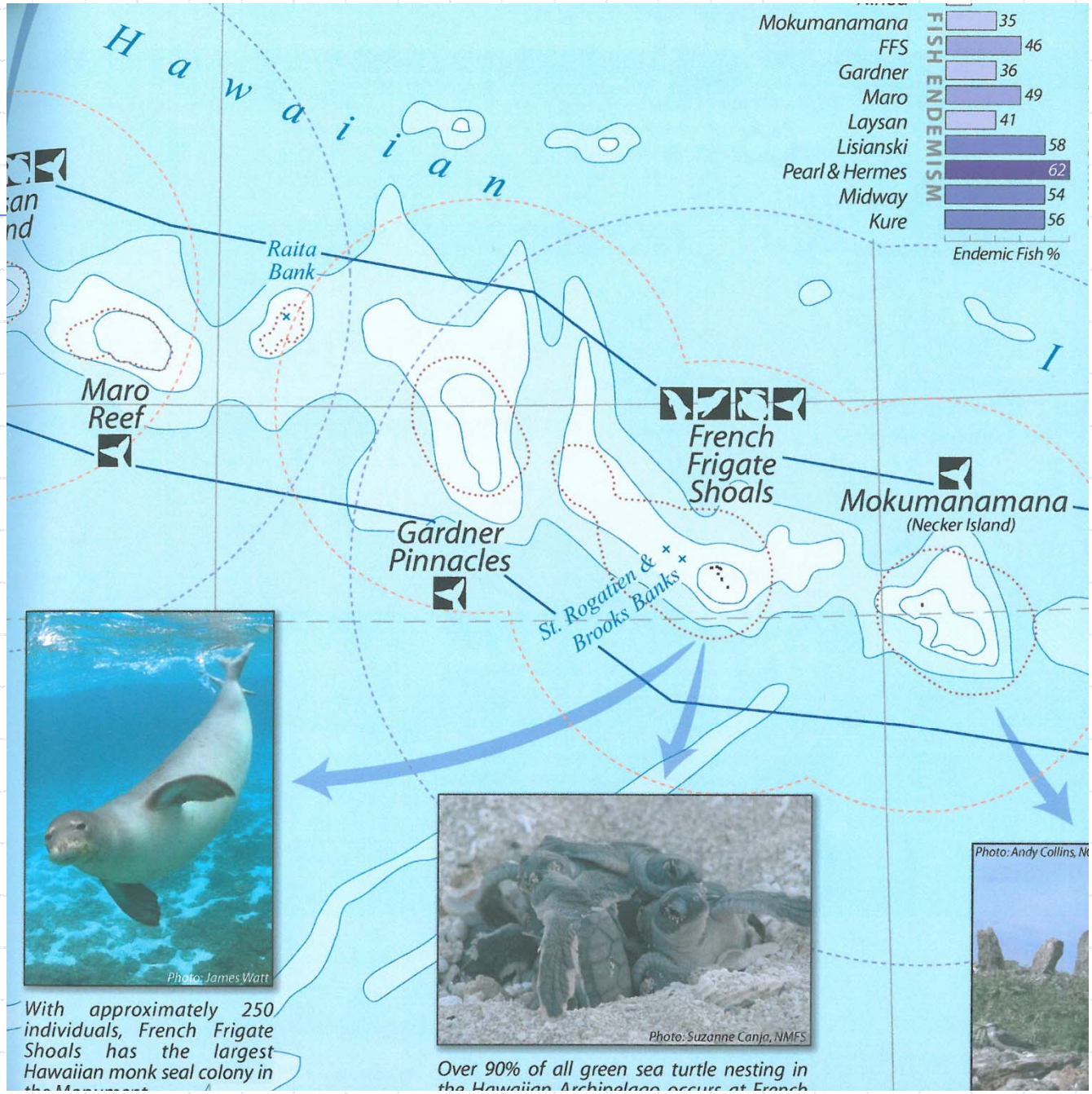
Legend

Marine National Monument
- Boundary

Foraging Ranges
- Hawaiian Monk Seal
- Masked Booby
- Red Footed Booby

Protected Species
- Spinner Dolphin Resting Area
- Largest Nesting Sites for Seabirds of Highest Concern
- Hawaiian Monk Seal Colony
- Green Sea Turtle Nesting Site
- Wintering Humpback Whales

Bathymetry
- 0 to 100 Fathoms
- 100 to 1,000 Fathoms
- 1,000 to 2,000 Fathoms
- 2,000+ Fathoms



With approximately 250 individuals, French Frigate Shoals has the largest Hawaiian monk seal colony in

Over 90% of all green sea turtle nesting in

What is a good map?

- …the measure of a good map is how well it conveys information to its readers to enlighten, convince, or persuade
- …so, a "good map" is a relative thing, based mostly upon the interpretation of the viewer
- …but...

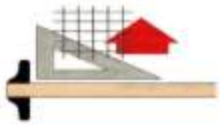
What is a good map?

- …the cartographer can create a map which will be accurate, current, topical, aesthetic, timely, relevant, and informative by…

- controlling map size, map elements, symbology, typography, use of color…and

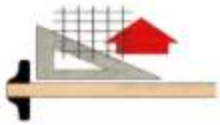
good design

Map Design Process

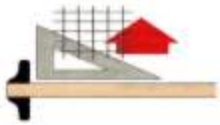


"The purpose of design is to focus the attention of the user."

Map Design Process



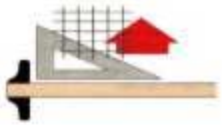
"know your audience"



Map Design Process

Before you start to design, you should know...

- the final dimensions of the map
- how the map will be displayed
- the purpose of the map
- who will use the map
- *who will pay for the map*



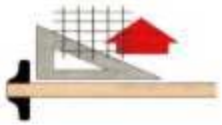
Map Design Process

Five Principles of Map Design

1. *concept before compilation*
2. *hierarchy with harmony*
3. *simplicity from sacrifice*
4. *maximum information at minimum cost*
5. *engage emotion to engage understanding*

- *from the Society of Cartographers, 1999*

Map Design Process

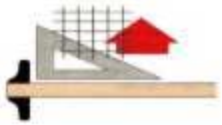


1. *"concept before compilation"*

- once concept is understood, no feature will be included which does not fit
- design the whole before the part
- design once, devise, design again

from the Society of Cartographers, 1999

Map Design Process

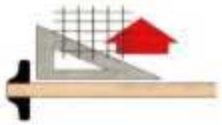


2. *"hierarchy with harmony"*

- important things must look important
- "they also serve who only stand and wait"
- all the parts contribute to the whole

◆ *from the Society of Cartographers, 1999*

Map Design Process

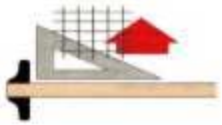


3. *"simplicity from sacrifice"*

- great design tends toward simplicity
- map design is complete when you can take nothing else out
- content determines scale or scale determines content

from the Society of Cartographers, 1999

Map Design Process

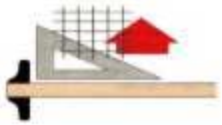


4. *"maximum information at minimum cost"*

- how much information can be gained from this map at a glance?
- not $ - minimize the user investment in effort
- all designs are a compromise

from the Society of Cartographers, 1999

Map Design Process

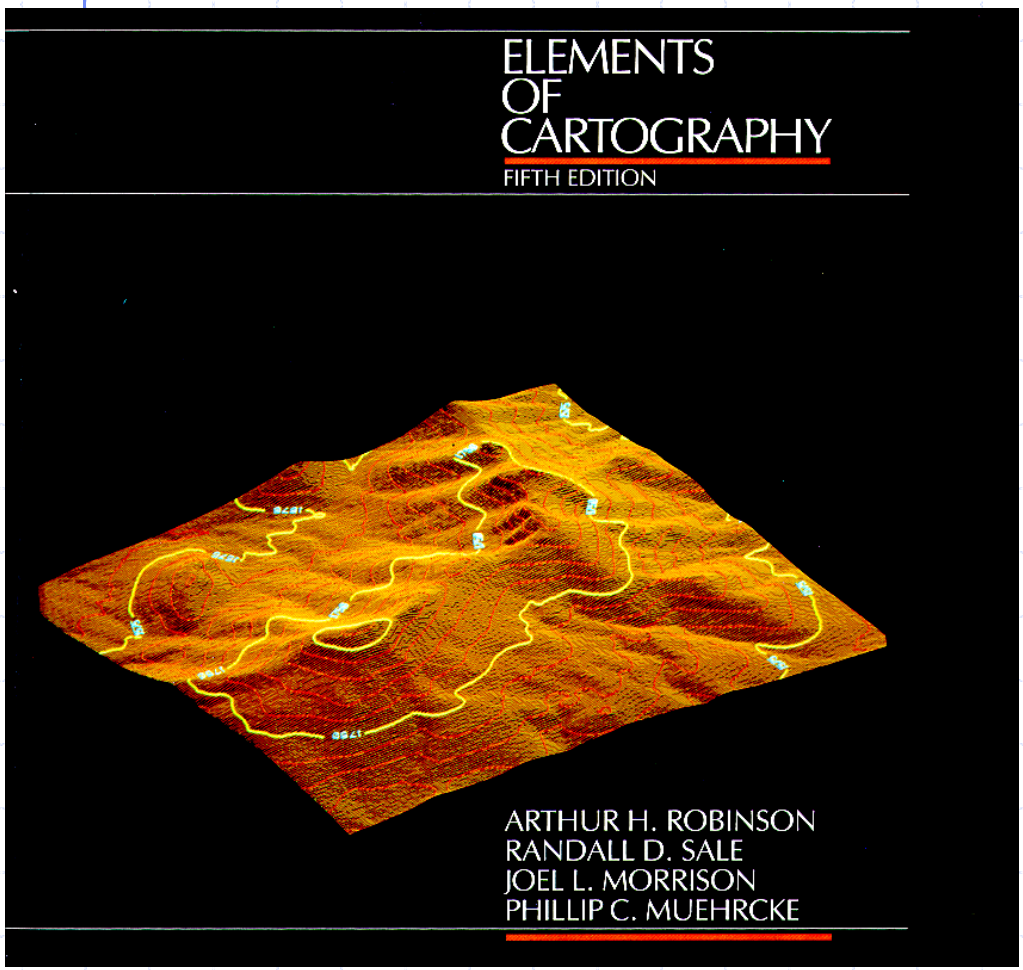


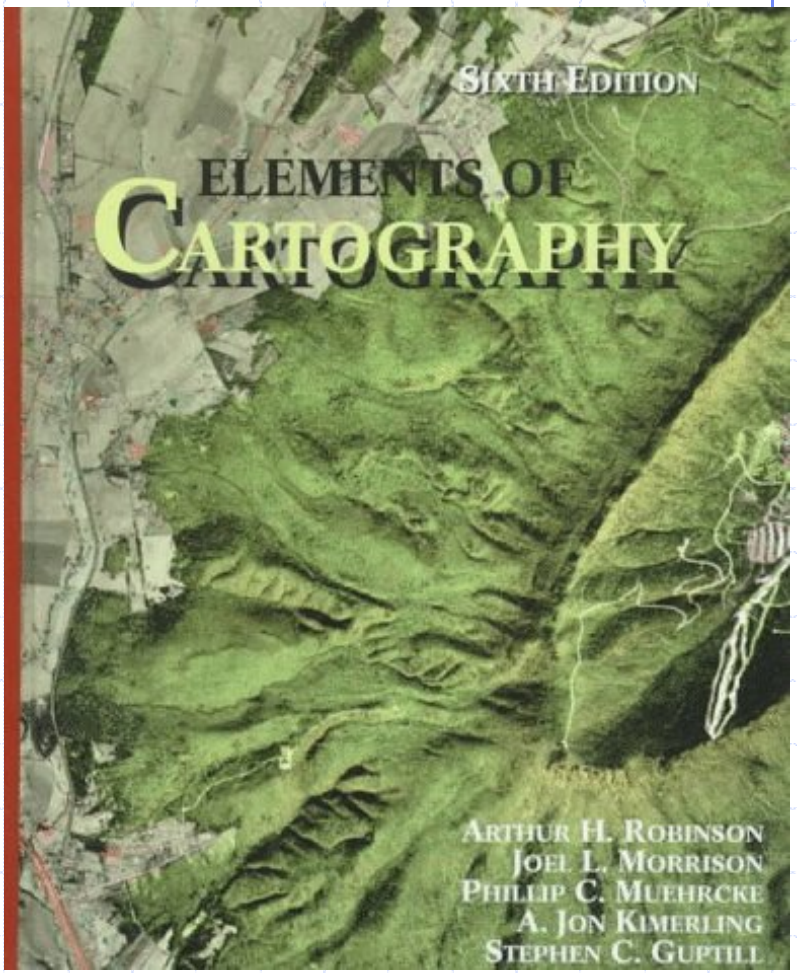
5. *"engage emotion to engage understanding"*

- only by feeling what the user feels can we see what the user sees
- aesthetics focuses the attention
- focusing the attention is the purpose of map design

from the Society of Cartographers, 1999

Book Recommendations





Book Recommendations