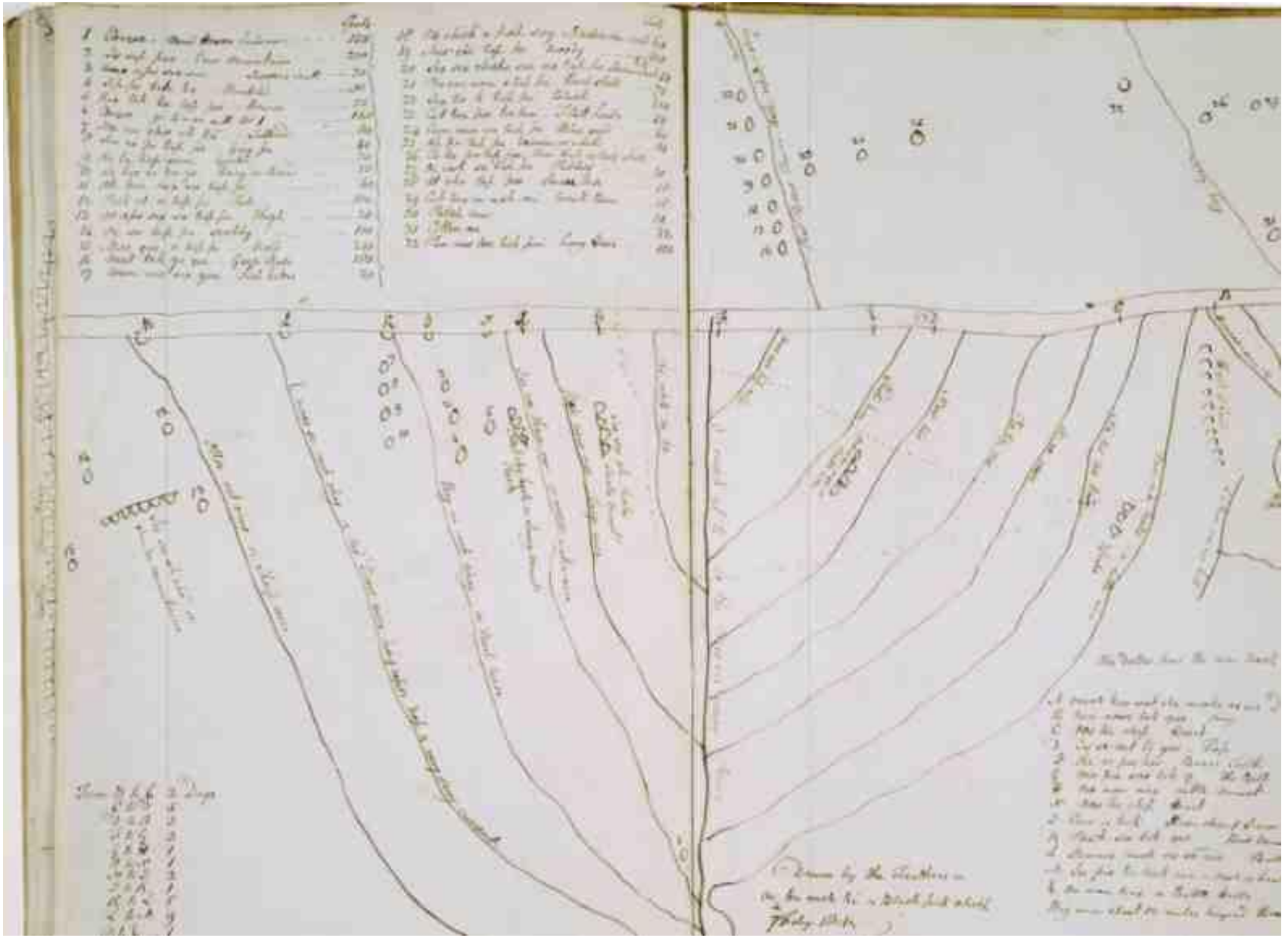
History of Cartography

World's oldest map ?
Babylonia, 6th century BC

https://www.geographyrealm.com/oldest-known-map-world/

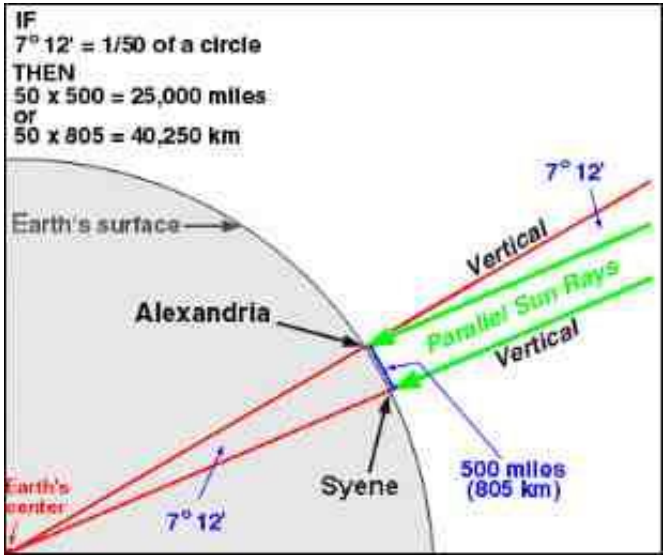
https://www.gislounge.com/mapping-through-the-ages/

In 1801, a Blackfoot named ‘**Ac ko mo ki’** drew a map in the snow or dirt for **Peter Fidler** of the Hudson's Bay Company.



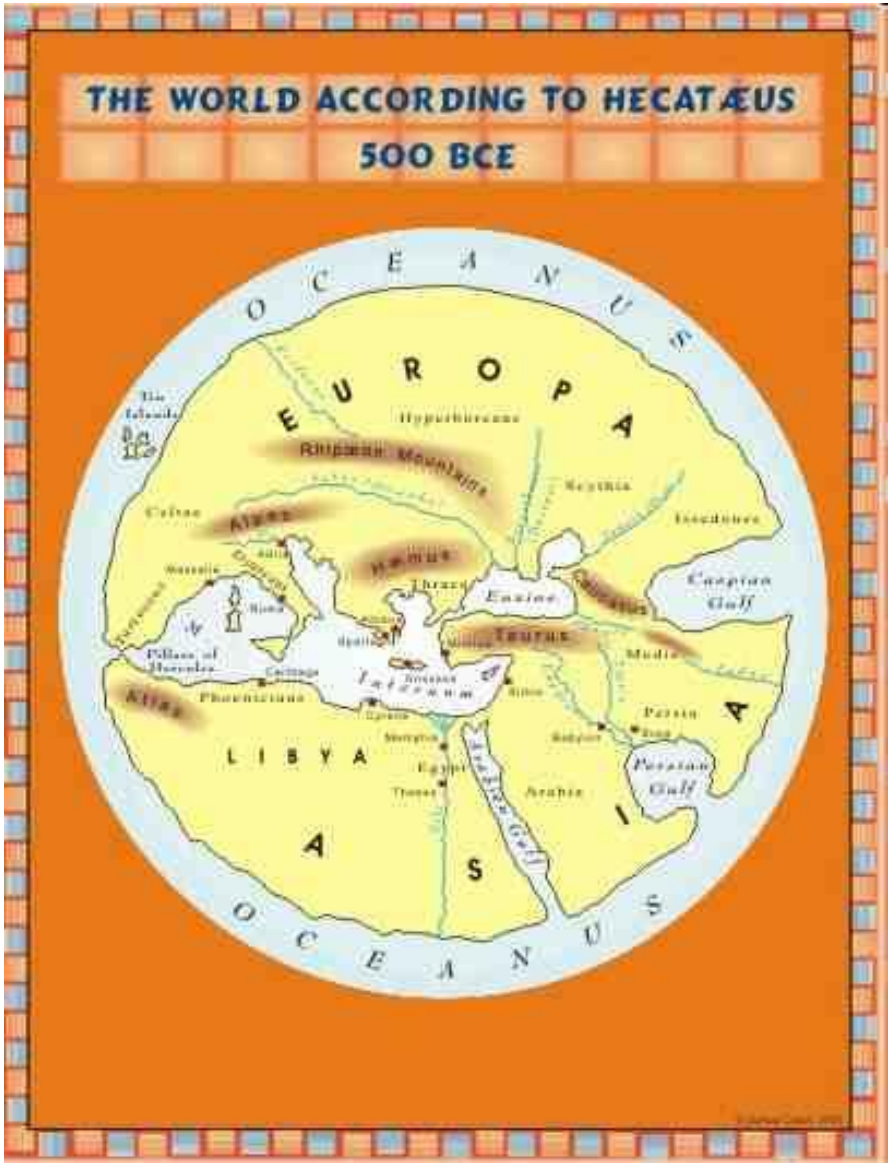
Ancient Greeks 500BC - 500AD

Eratosthenes (275-195BC)
- circumference of earth

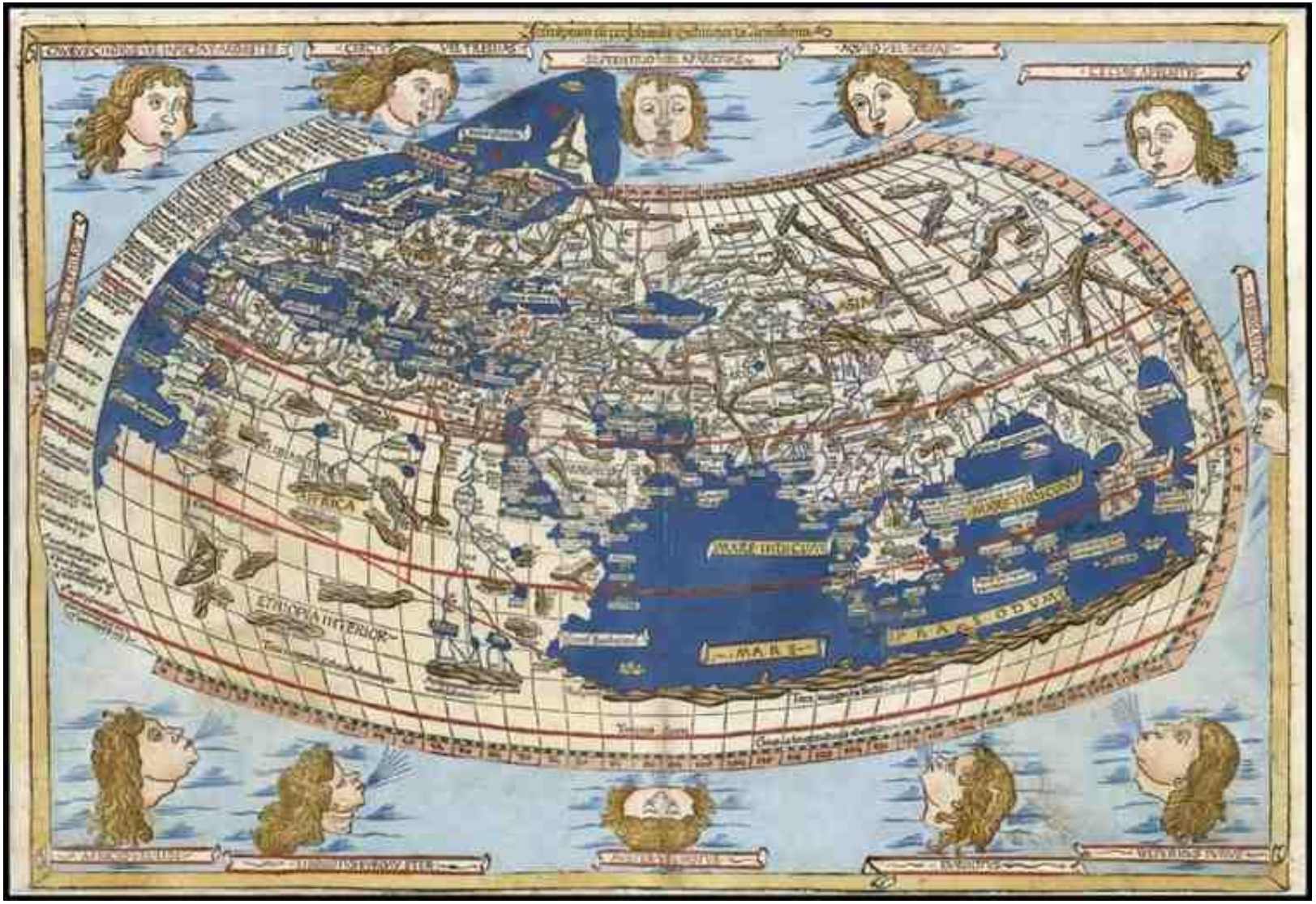


Hipparchus (190-120BC)
- latitude / longitude

First map projections
- azimuthal Thales, etc.)



Ancient Greeks Claudius Ptolemy, (AD 90-168)



Ptolemy compiled all known world locations

- Overestimation of longitude extent contributed to Columbus ‘bumping’ into America

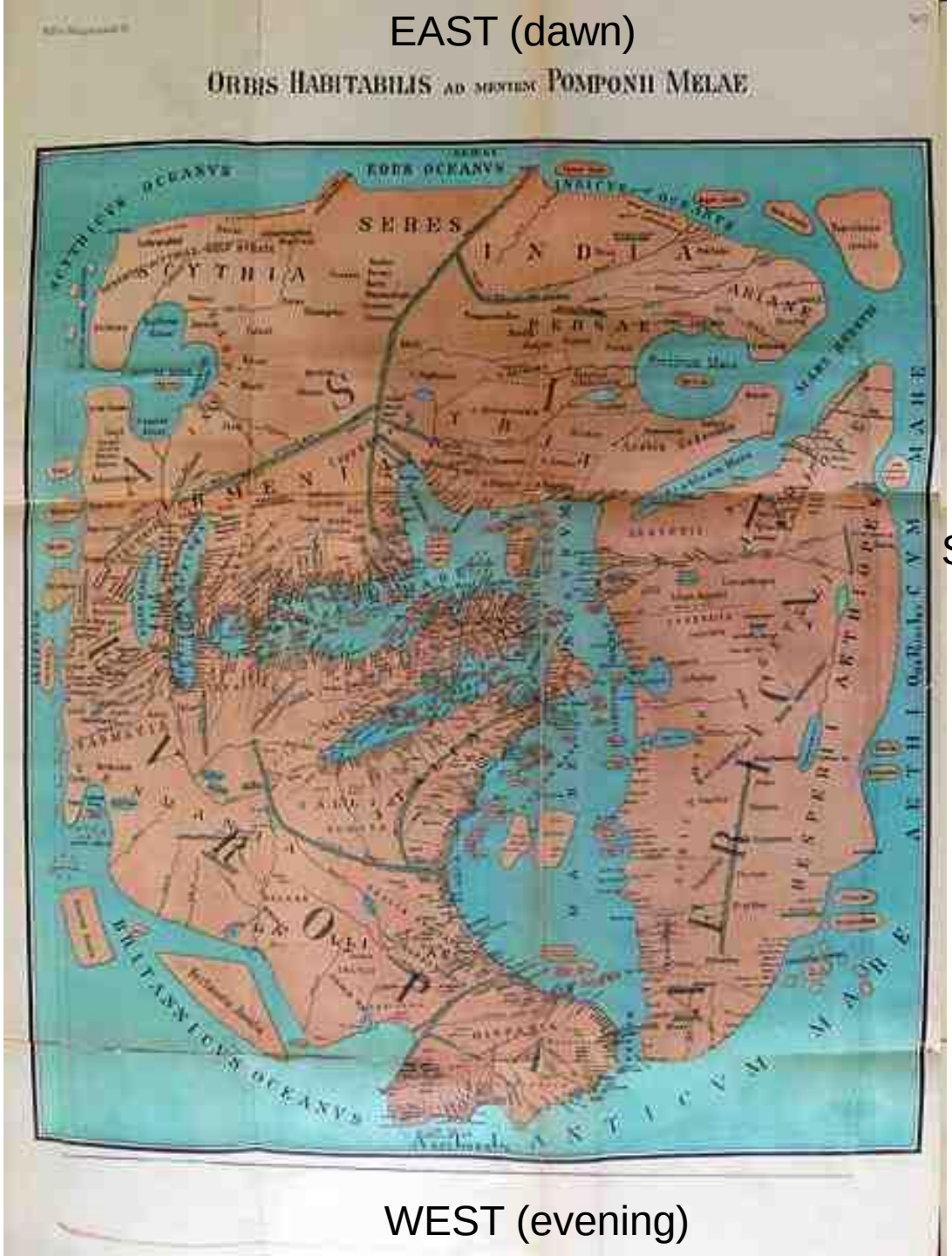

THE WORLD ACCORDING TO CHRISTOPHER COLUMBUS c.1490
OCEANUS SEPTRIONALIS
Lappland
Tartaria
Scithia
Tangut
Tartaria
Oceania
Magna Germania
Gallia
Tartaria
Serica
Cathaia
Cathay
China
OCEANUS ORIENTALIS INDIAE
SPAIN
Thebet
Azores
Mare Mediterraneum
India Intra
Assiria
Persia
India Extra
Manji
Atlas Montes
Sinus Persicus
Columbus' proposed route
Canary is.
Genea
Egyptia
Cipangu
Japan
Ciamba
Libia
Atillia is.
Saba
Taprobana is.
Cape Verde
Ethiopia
Minupias is.
Coachi
Gambiagalo
Moabar
Sant Brandan
Aromata
OCEANUS SUPERIOURIS INDIAE
Abasia
Coylur
Loah
Seylan is.
Sri-Lanka
Java major
Candyn
Neucuram
Madagascar
OCEANUS INDIAE MERIDIONAL
Pentam
Angama
Java minor
OCEANUS EQUINOCTIARIS CIRCULUS
Zanzibar
WORLD HISTORY ENCYCLOPEDIA

Roman world map reconstruction

AD 43

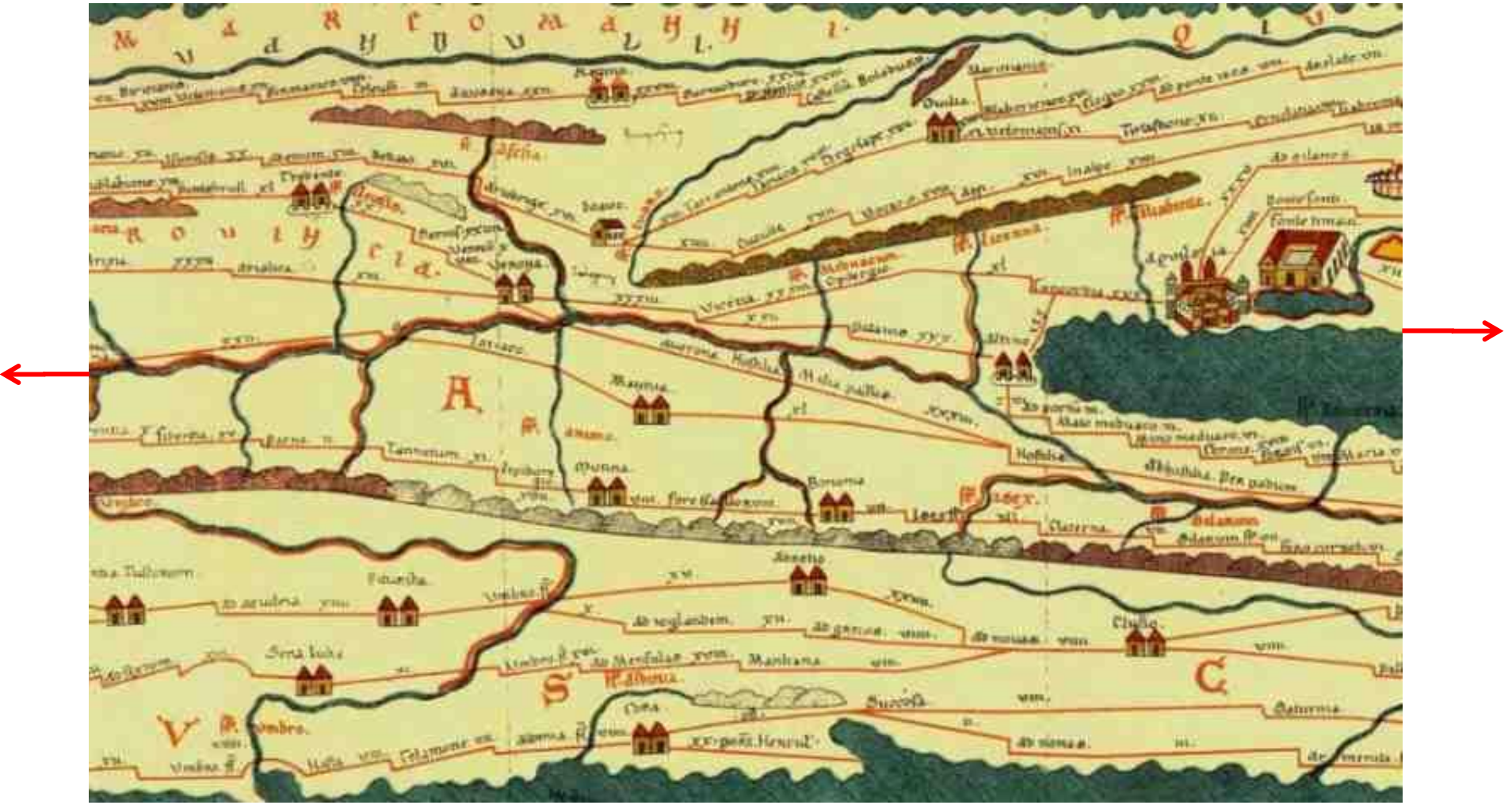
NORTH (Left)

East (Orient) to top



Romans: Tabula Peutingeriana (4th century)

The Tabula Peutingeriana (*Peutinger table*) shows the road network in the Roman Empire. It is a 13th-century copy of an original map dating from the 4th century, covering Europe, parts of Asia (India) and North-Africa.



Early car navigation device, like the Peutinger table:

Pre-GPS 1910s

The Medieval Dark Ages: "T-in-O" maps

T is the Mediterranean and Nile/Don Rivers O is the extent of the known world:

Anglo-Saxon map 1050AD

Hereford Mappa Mundi ~1300

'T in O' map

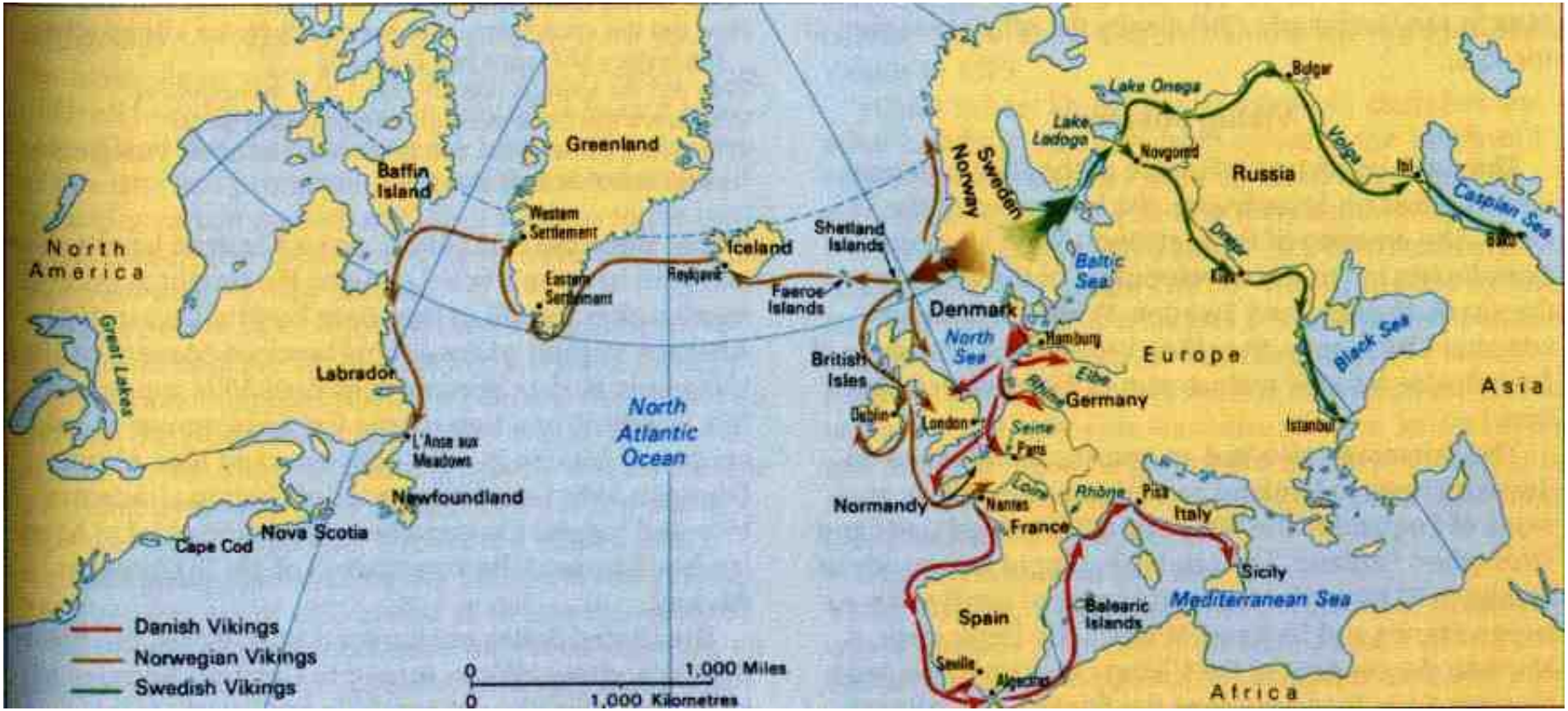
Viking voyages of 'exploration' : 793-1066AD

Faroes 825 (510: St. Brendan)

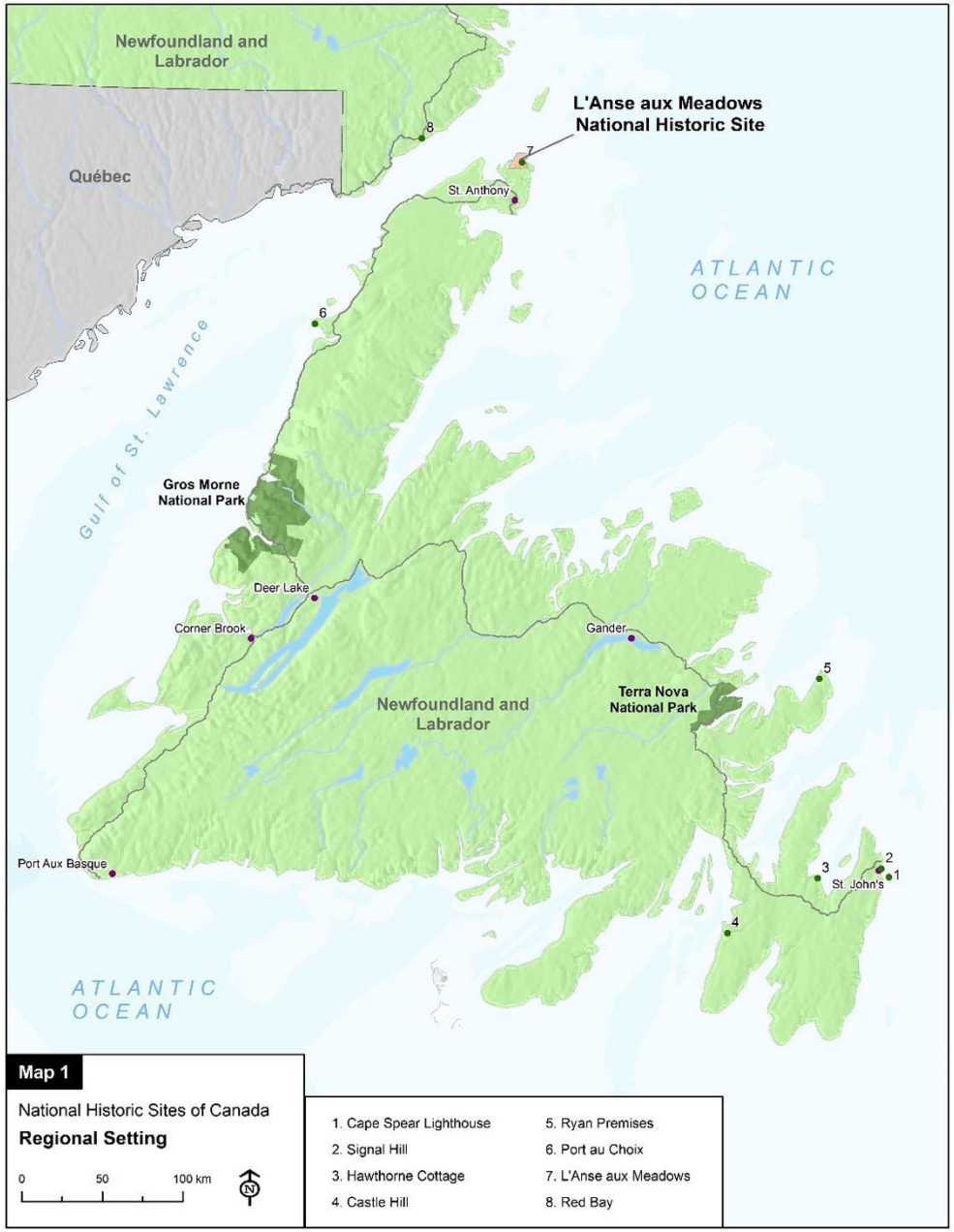
Iceland 874 (Irish monks earlier)

Greenland 980

Newfoundland 986 (proven in the 1960s)



L'Anse aux meadows, NL
Leif Erikson ~ 995 (1000) AD



Vinland map: Discovered 1957, dated to ~1440

contained 1920s inks and radioactive elements from 1950s showed it to be a likely fake – did Europeans know about America before 1492 ?

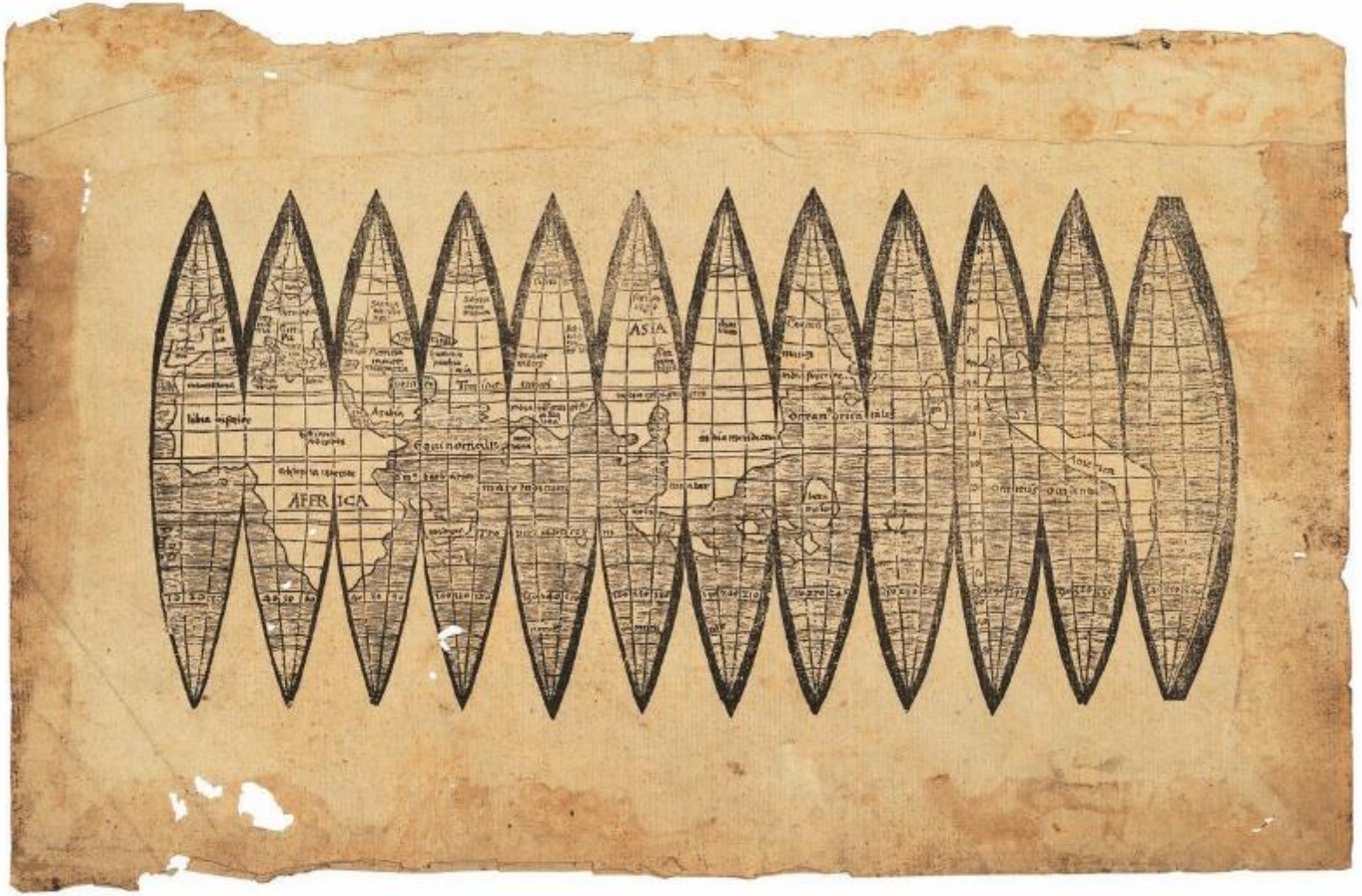
Chinese map, 1763 copied from 1418 ?

Arabic cartography: Al-Idrisi 12th century

The *Tabula Rogeriana*, by Muhammad al-Idrisi for Roger II of Sicily 1154.

The Renaissance (~1400): Ptolemy's world is 'rediscovered'

First European map showing America, 1507
from voyages of discovery: Martin Waldseemüller,



Voyages of discovery, rediscovering the Greek cartography …..
But the biggest change in the renaissance and the 2nd millenium was:

Invention of the printing press by Gutenberg, 1440

(though movable type was developed in China in 1041 by Bi Sheng)

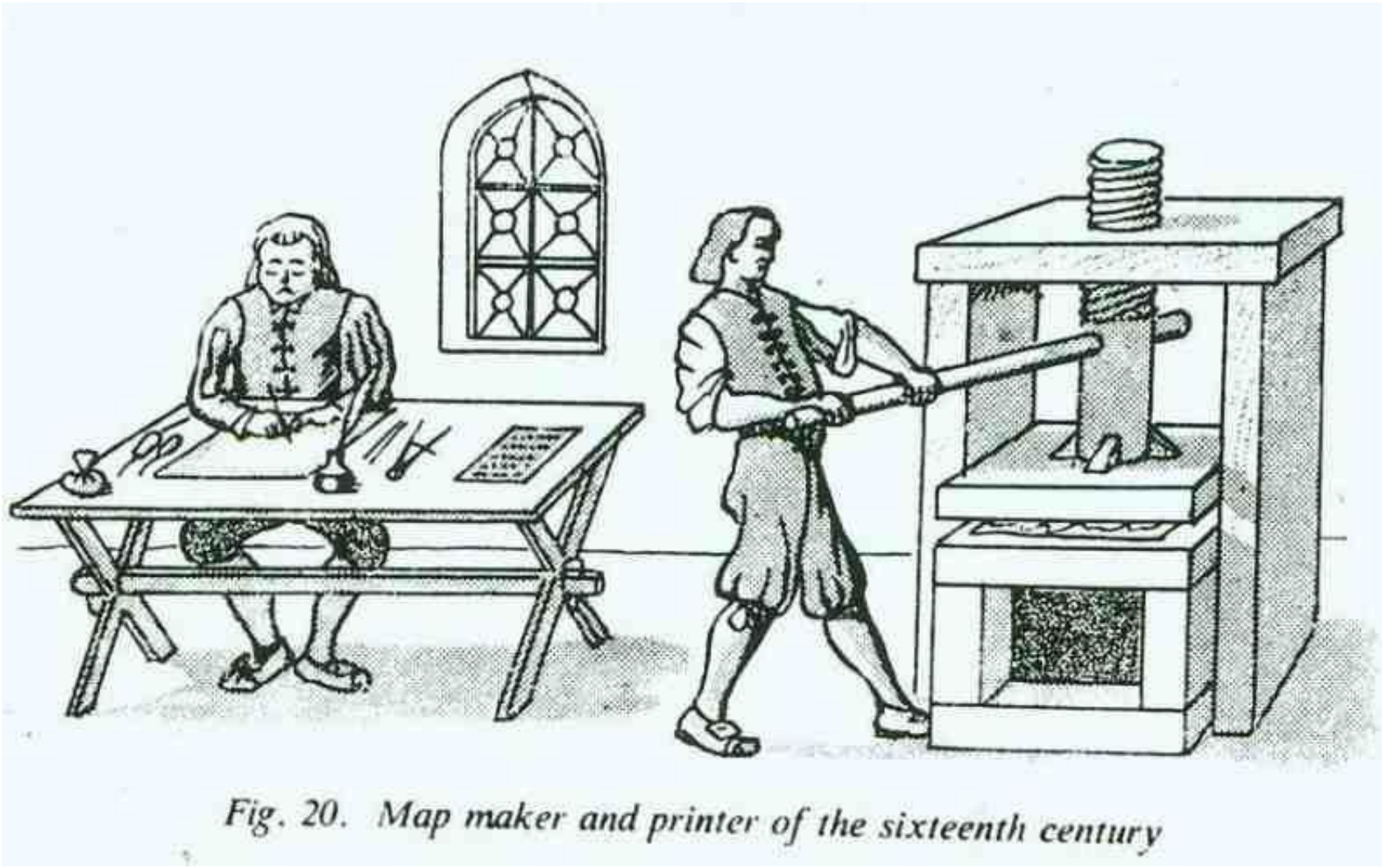
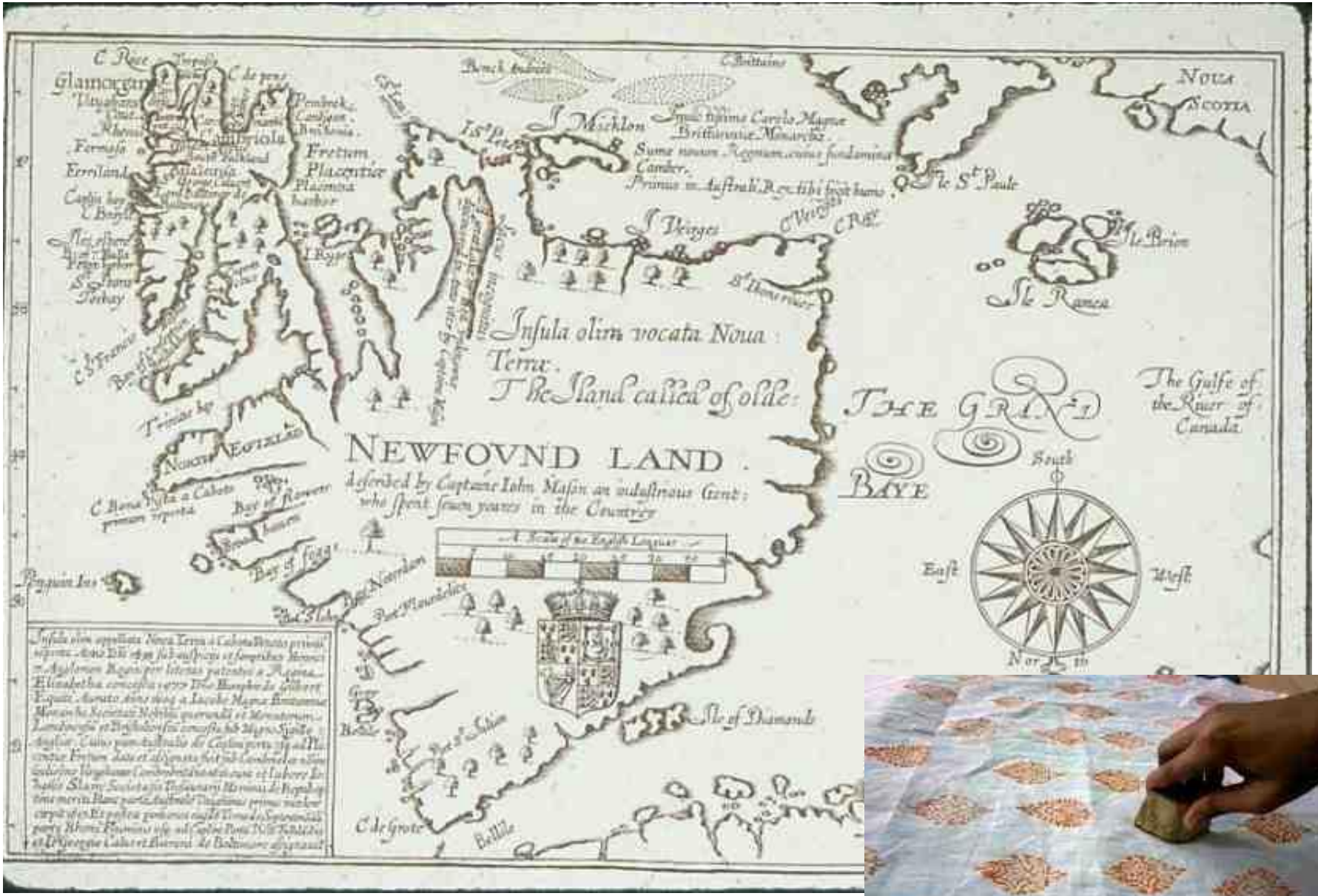


Fig. 20. Map maker and printer of the sixteenth century

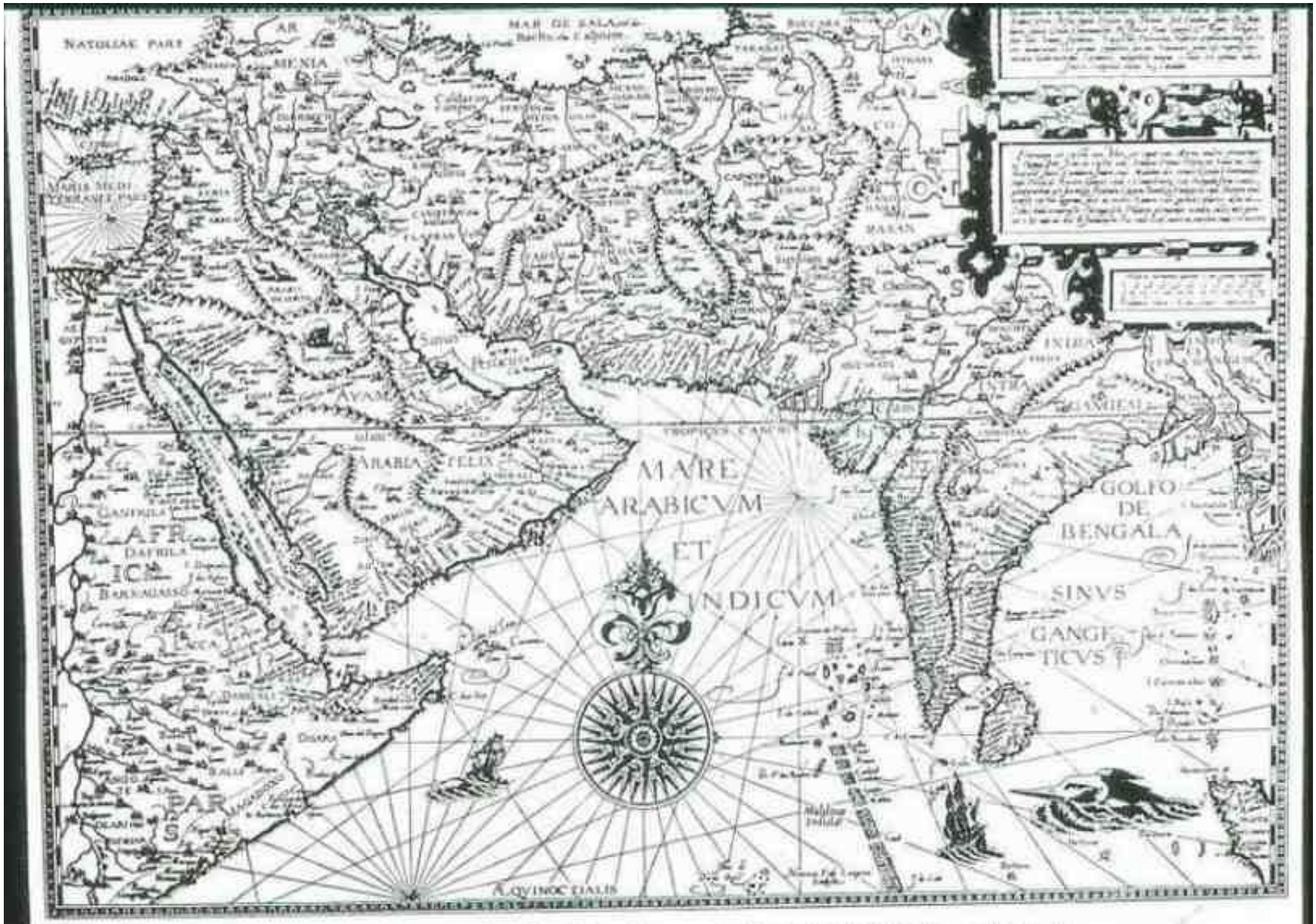
Maps (and books) could now be printed in quantity

Printing technology: 16th century woodcut



Wrong-reading plate – mirror image

Copper engraving ('intaglio') 1596



The Indian Ocean, engraved by Hendrik van Langeren. In Linschoten's *Itinerario* (Amsterdam, 1596)

Iceland 1590

The development of the sciences 1700->

- Division into topographic and thematic mapping

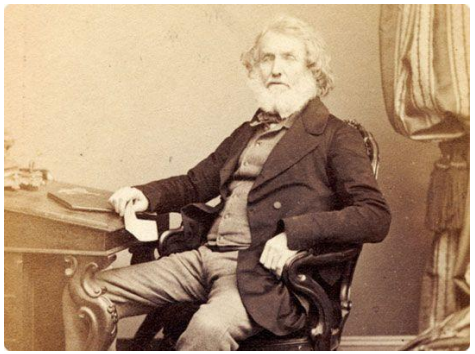
Data collection e.g. census

- Development of surveying

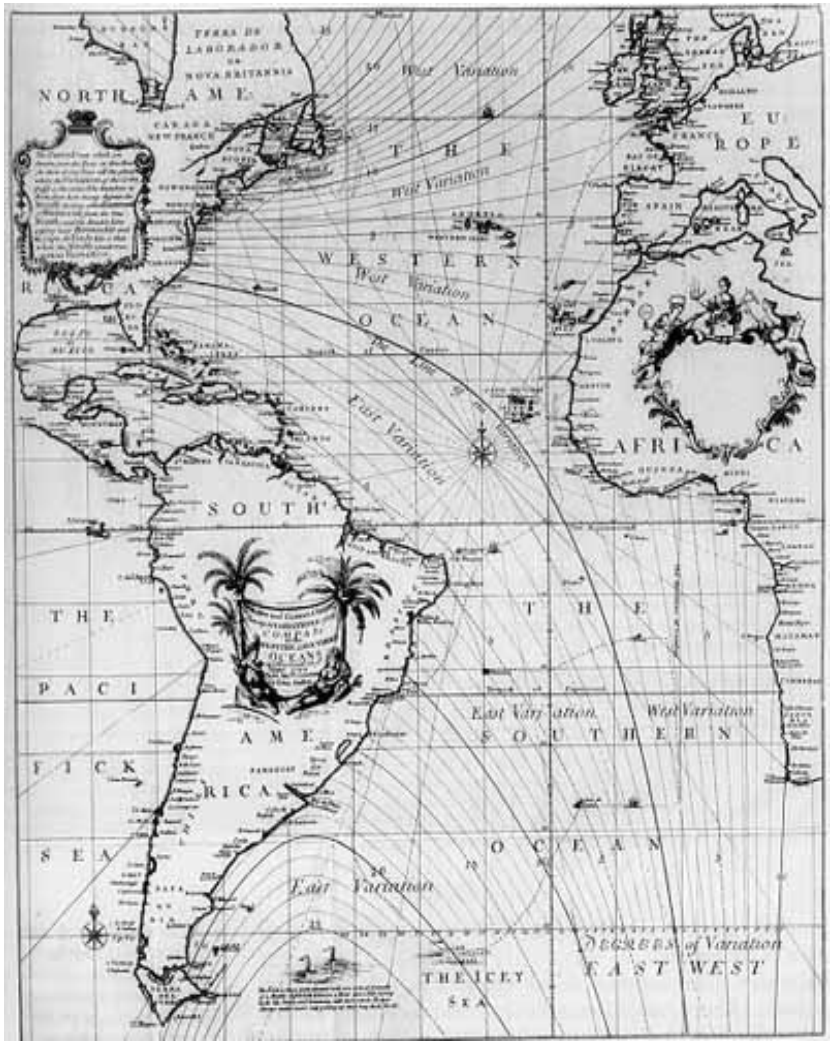
- Geodesy: first calculation of earth's ellipsoid 1817

- few elevations pre-1800s

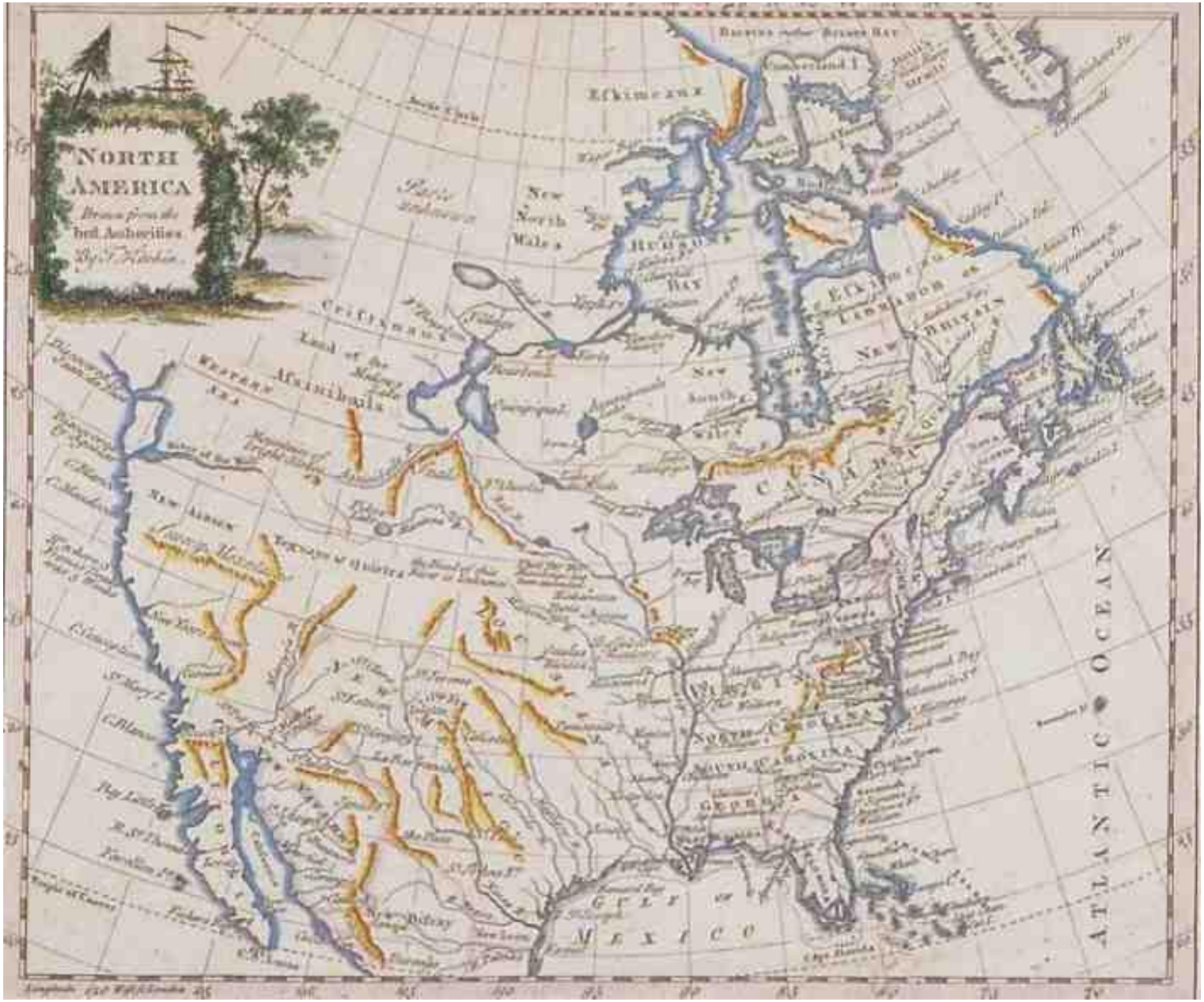
- George Everest Ellipsoid 1830



Halley's 'isogonic' map – lines of equal compass Declination (from true north)



Early 18th century colour map (hand coloured)



Latitude was easy to measure but Longitude ??

Sir Cloudsley Shovell and grave Scilly Isles, 1707

Longitude 1759

John Harrison's chronometer

Accurately measured time to compare with local time and how far east/west compared to starting point

Time zones (1883) – Sandford Fleming (Canada)

1 hour = 15° longitude

Also made into a movie

Lithographic (stone) printing plate (1796)

Based on water and oil not mixing –Alois Senefelder

Plate is created 'wrong-reading'
= mirror image
'Transfer lithography' came later

Printing methods

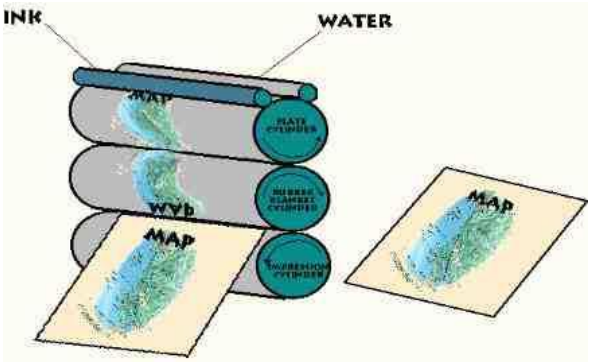
- Woodcut: image area is raised and holds ink
- Intaglio engraving: incised cuts hold ink
- Lithography: surface texture (grease) holds ink

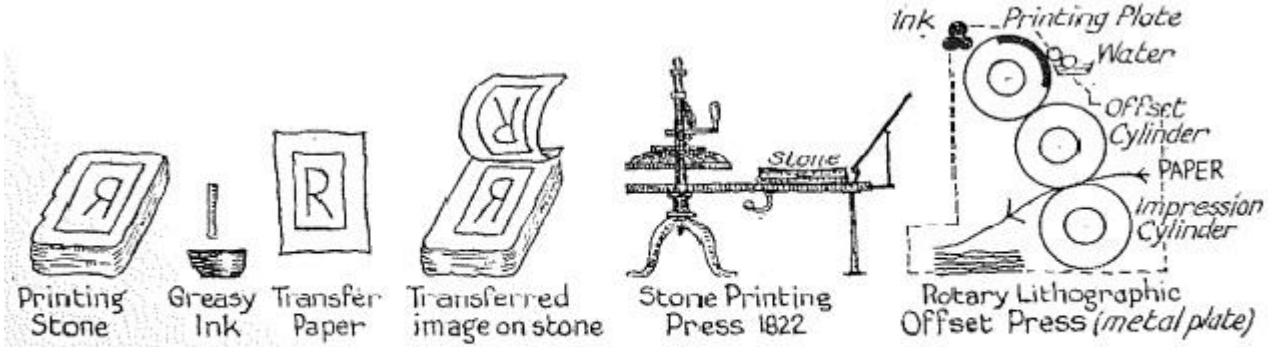
These methods could NOT show continuous shading or colour registration (for layers), and were mirror images

Photo-lithography & offset printing (1875)

With photo-lithography, full colour map prints were possible.
Thin copper plates are produced from photo negatives.
Plates wrap around drums, therefore printing was continuous.
An intermediate drum added … to avoid a wrong reading plate.

Offset Cylinder

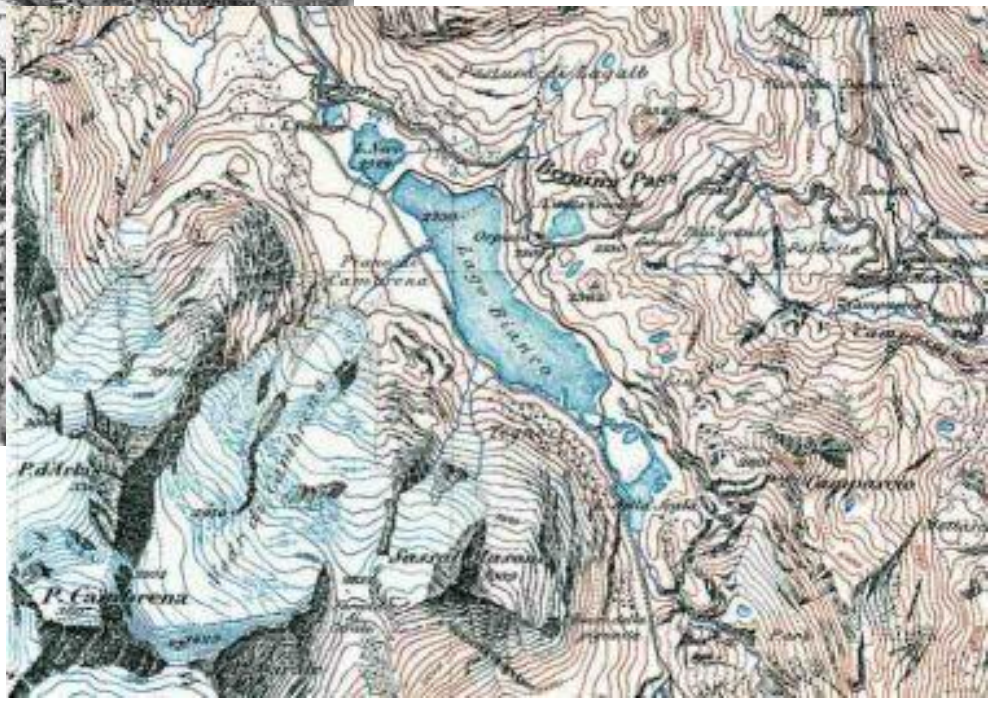




The Progress of Lithography

Impact of offset printing and improved survey technology

Dufour hachures Switzerland, 1845-65



Bernina Pass, Switzerland 1877

http://map.geodataviewer.admin.ch/geodatenviewer.php

During the 20th century, maps became more abundant due to improvements in printing and photography that made production cheaper and easier.

1920 ->

20th century Technology

Aerial photography

Photogrammetry

Post- war (1945)
Mapping of Canada

Return of pilots and planes from World War 2 …

Postwar (1950) society changes affecting mapping

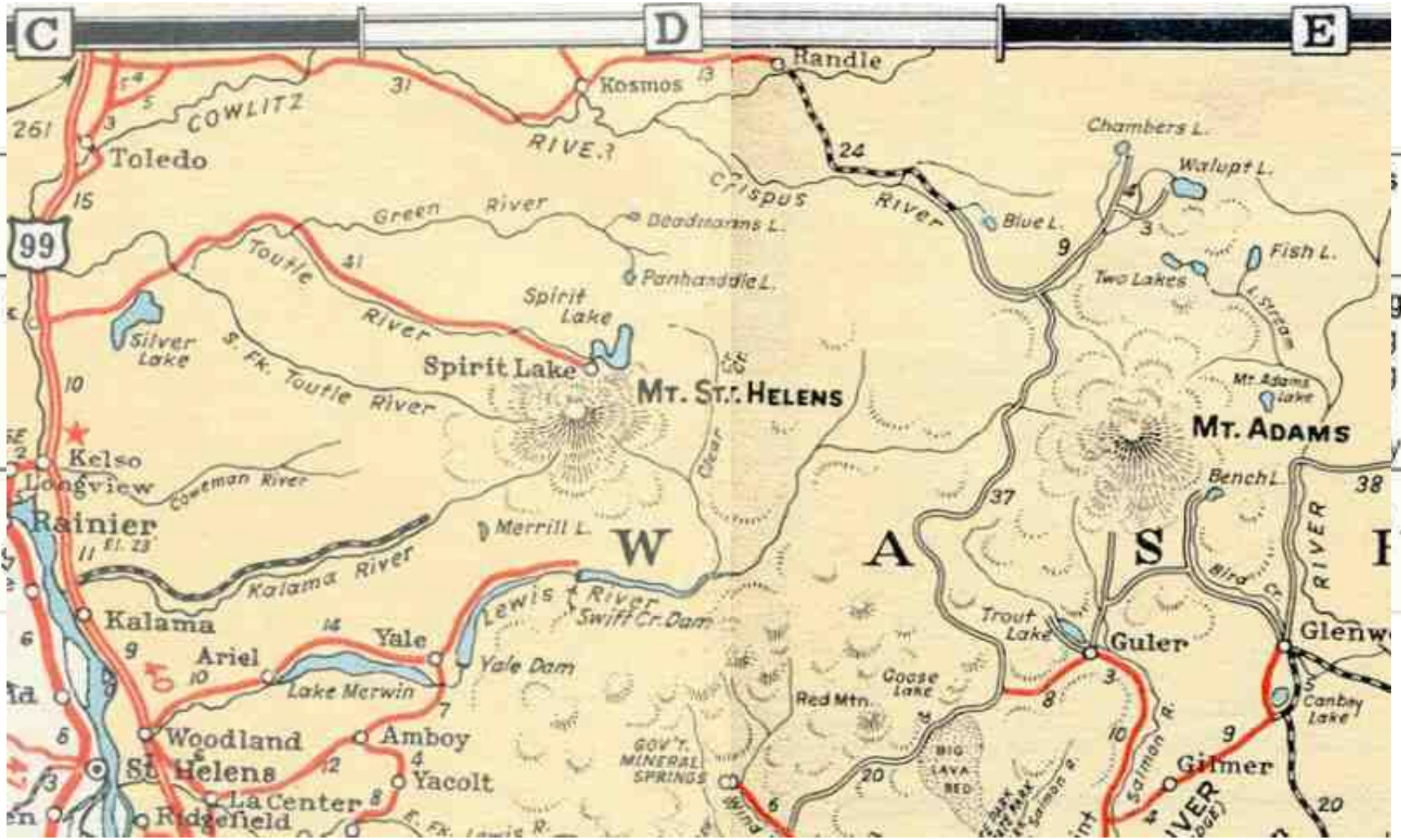
- Increased leisure time and travel – road maps, park maps

- Addition of hillshading (still costly before computers)

- Increased attention to non-scientific users

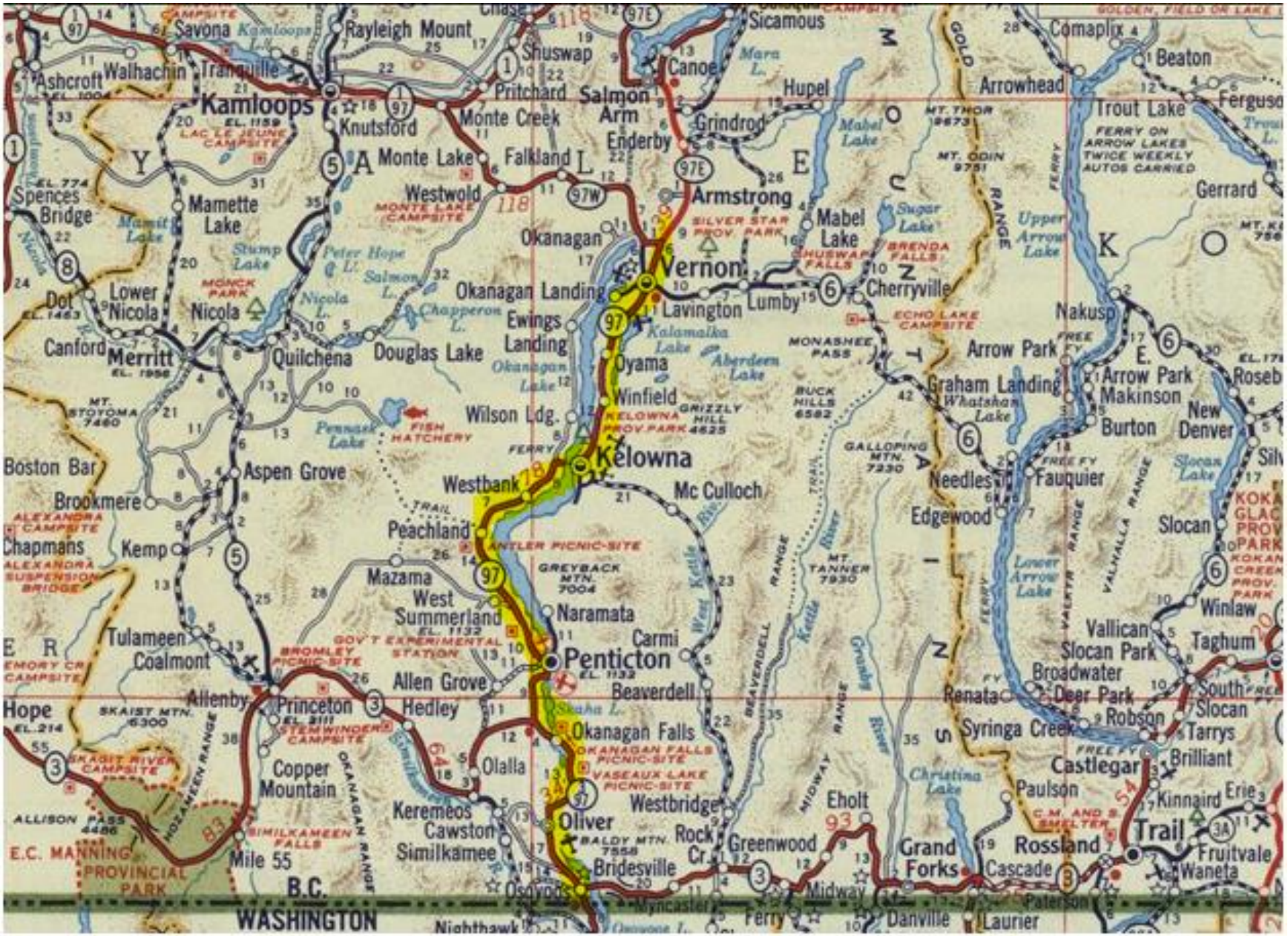
- Maps for new groups, e.g. visually impaired

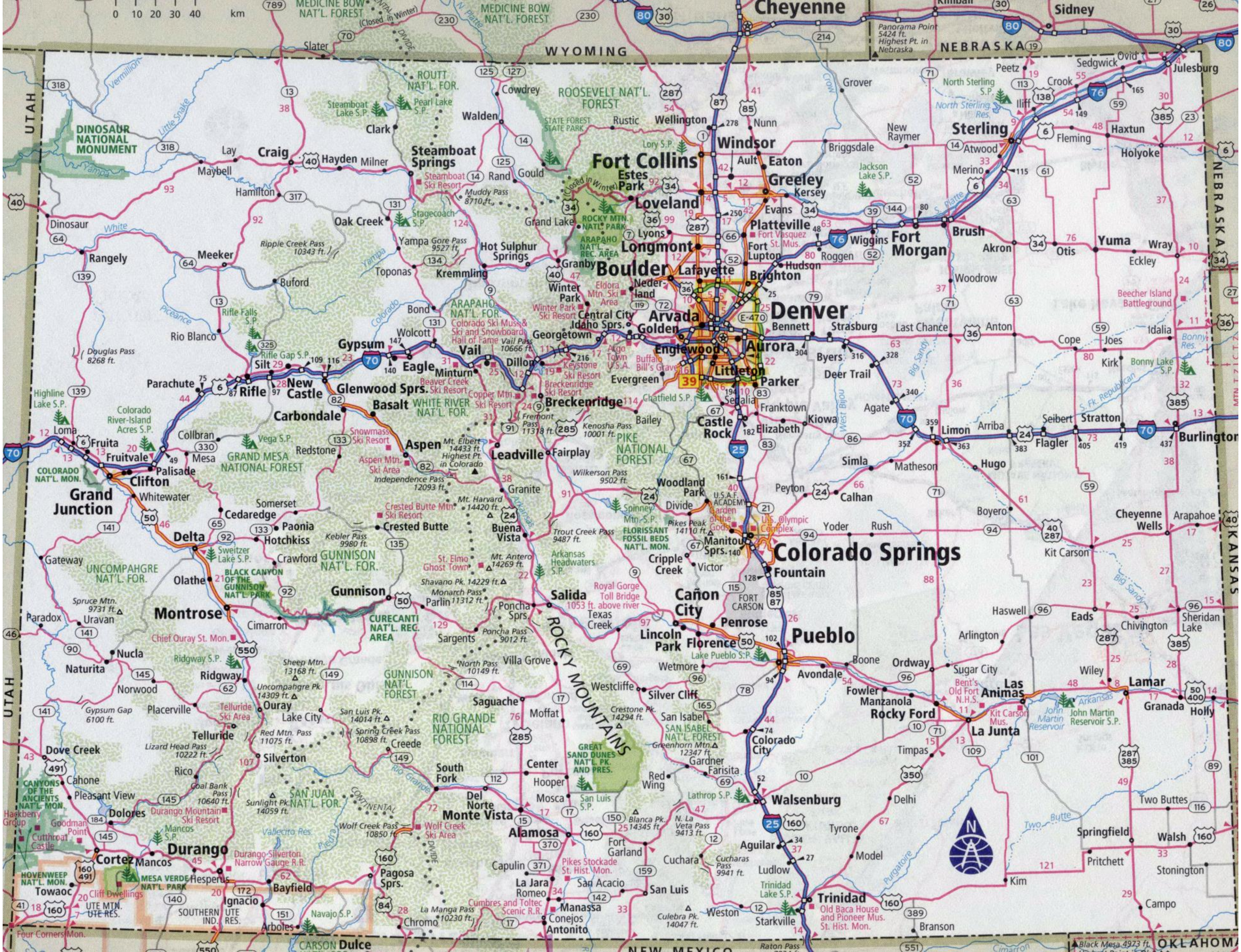
Society changes after ~1950 – road maps



http://roadsandmaps.zxq.net/images/1959OregonOfficial/oregon-west.png

BC 1966 road map

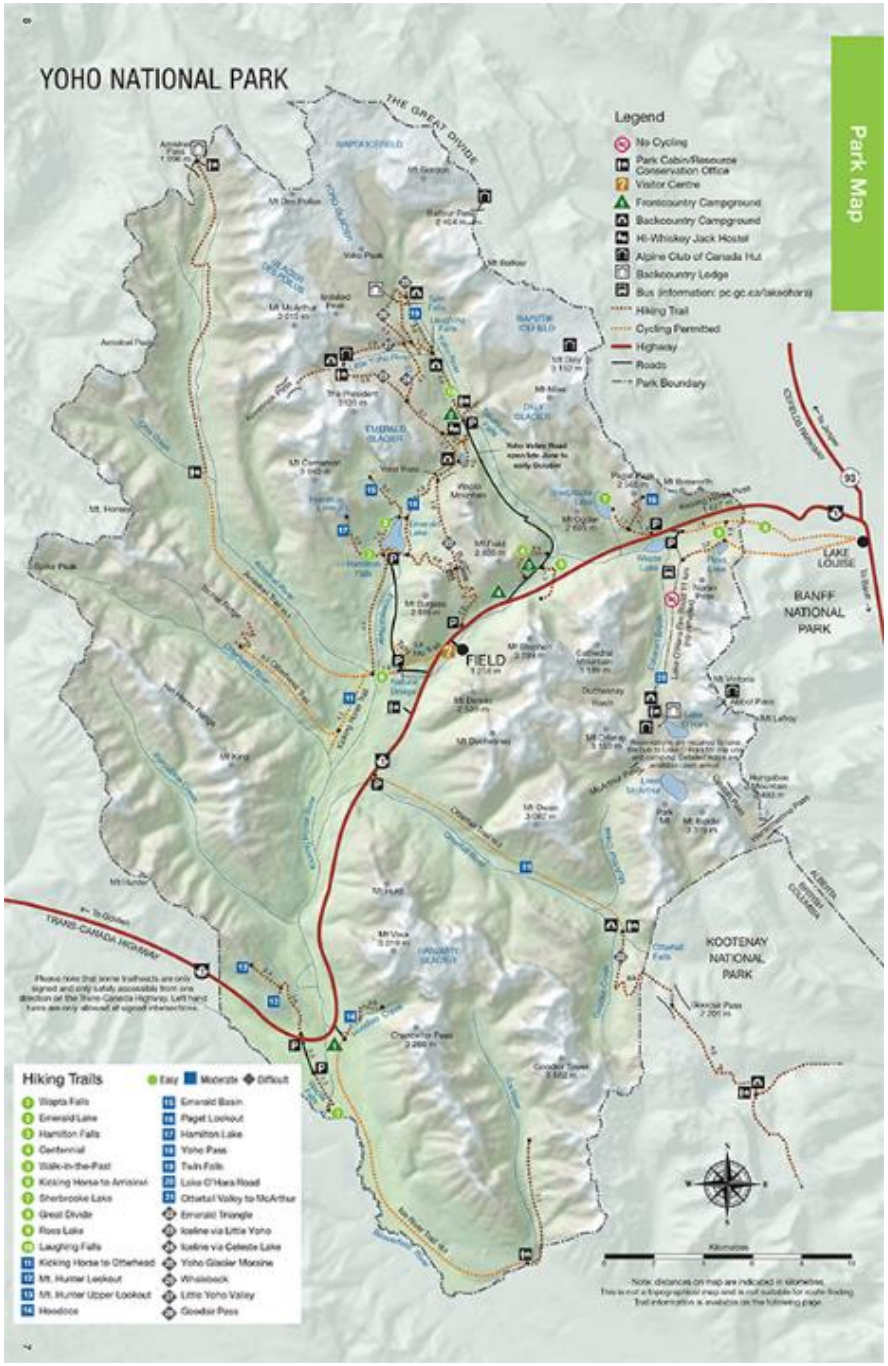




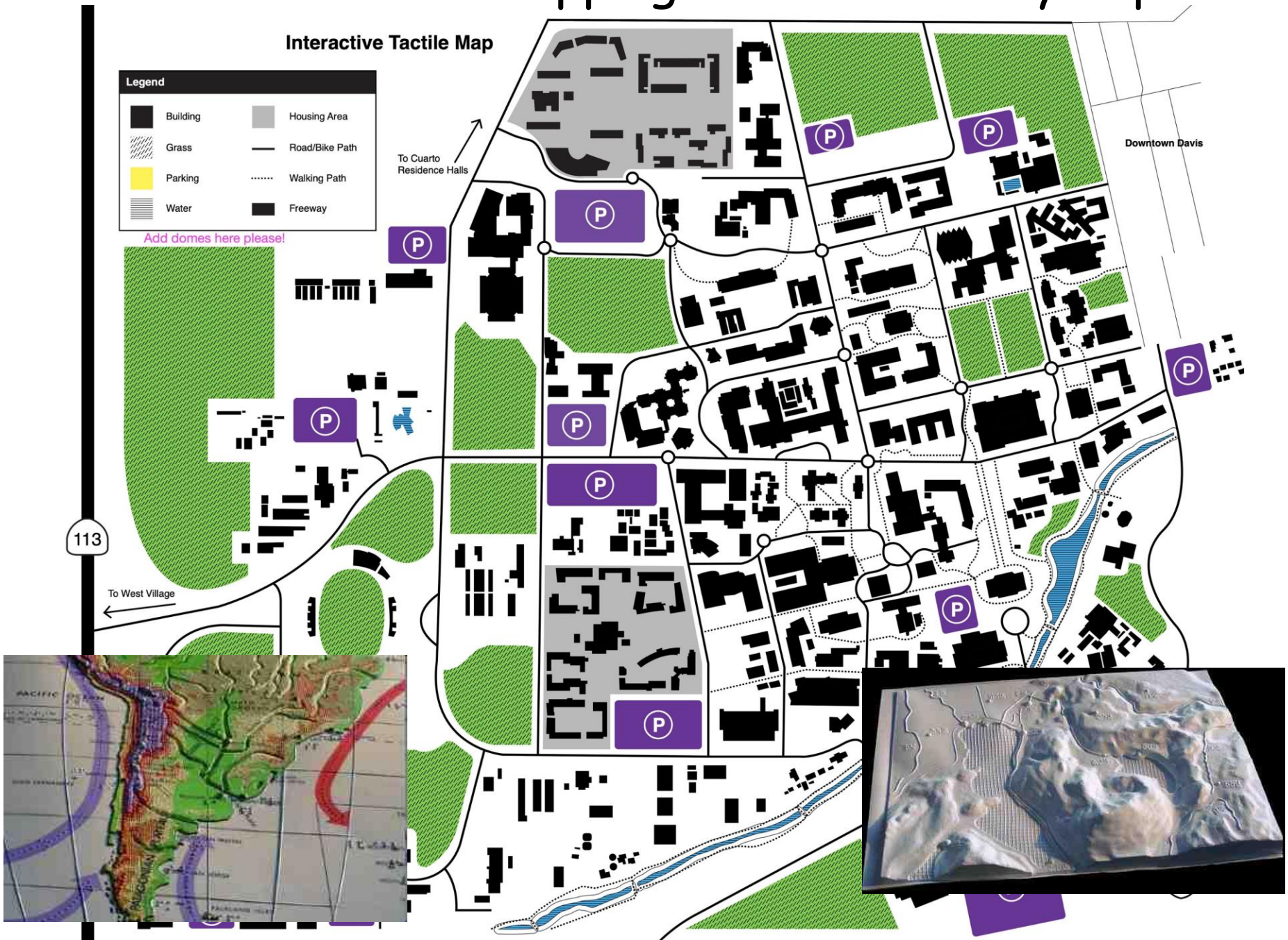
0 10 20 30 40 km
WYOMING
NEBRASKA
KANSAS
OKLAHOMA
NEW MEXICO
UTAH
Cheyenne
Sidney
Kimball
Panorama Point 5424 ft. Highest Pt. in Nebraska
MEDICINE BOW NAT'L. FOREST
ROUTT NAT'L. FOR.
ROOSEVELT NAT'L. FOREST
DINOSAUR NATIONAL MONUMENT
Slater
Cowdrey
Walden
Steamboat Lake S.P.
Pearl Lake S.P.
Clark
Rustic
Wellington
Grover
Peetz
Sedgwick
Ovid
Julesburg
Crook
Iliff
North Sterling S.P.
Nunn
New Raymer
Sterling
Haxtun
Fleming
Holyoke
Atwood
Merino
Windsor
Ault
Eaton
Briggsdale
Jackson Lake S.P.
Fort Collins
Estes Park
Greeley
Kersey
Loveland
Evans
Craig
Hayden
Milner
Lay
Maybell
Hamilton
Steamboat Springs
Steamboat Ski Resort
Rand
Gould
Muddy Pass 8710 ft.
State Forest State Park
Rocky Mtn. Nat'l. Park
Lory S.P.
Dinosaur
Rangely
Meeker
Buford
Oak Creek
Stagecoach S.P.
Yampa
Gore Pass 9527 ft.
Hot Sulphur Springs
Grand Lake
Granby
Arapaho Nat'l. Rec. Area
Lyons
Platteville
Fort Vasquez St. Mus.
Longmont
Boulder
Lafayette
Fort Lupton
Hudson
Roggen
Wiggins
Fort Morgan
Brush
Akron
Otis
Yuma
Wray
Eckley
Ripple Creek Pass 10343 ft.
Toponas
Kremmling
Brighton
Woodrow
Beecher Island Battleground
Winter Park
Eldora Mtn. Ski Area
Nederland
Winter Park Ski Resort
Central City
Idaho Spgs.
Arvada
Golden
Denver
Bennett
Strasburg
Last Chance
Anton
Cope
Joes
Idalia
Bonny Res.
Rifle Falls S.P.
Rio Blanco
Bond
Wolcott
Arapaho Nat'l. For.
Colorado Ski Mus. & Ski and Snowboard Hall of Fame
Vail Pass 10666 ft.
Georgetown
Douglas Pass 8268 ft.
Rifle Gap S.P.
Gypsum
Eagle
Vail
Minturn
Dillon
Keystone Ski Resort
Breckenridge Ski Resort
Argo Town U.S.A.
Buffalo Bill's Grave
Englewood
Aurora
Byers
Deer Trail
Kirk
Bonny Lake S.P.
Parachute
Silt
Rifle
New Castle
Glenwood Sprs.
Beaver Creek Ski Resort
Copper Mtn. Ski Resort
Breckenridge
Evergreen
Littleton
Parker
Chatfield S.P.
Sedalia
Franktown
Elizabeth
Kiowa
Agate
Limon
Arriba
Seibert
Stratton
Flagler
Burlington
Highline Lake S.P.
Colorado River-Island Acres S.P.
Basalt
Carbondale
White River Nat'l. For.
Fremont Pass 11318 ft.
Kenosha Pass 10001 ft.
Bailey
Castle Rock
Loma
Fruita
Fruitvale
Colorado Nat'l. Mon.
Grand Junction
Clifton
Palisade
Collbran
Mesa
Vega S.P.
Redstone
Snowmass Ski Resort
Aspen
Aspen Mtn. Ski Area
Mt. Elbert 14433 ft. Highest Pt. in Colorado
Leadville
Fairplay
Pike National Forest
Simla
Matheson
Hugo
Grand Mesa National Forest
Whitewater
Independence Pass 12093 ft.
Granite
Wilkerson Pass 9502 ft.
Woodland Park
Peyton
Calhan
Cedaredge
Somerset
Paonia
Hotchkiss
Crested Butte Mtn. Ski Resort
Crested Butte
Mt. Harvard 14420 ft.
Buena Vista
Divide
U.S.A.F. Academy
Garden of the Gods
U.S. Olympic Complex
Yoder
Rush
Boyero
Cheyenne Wells
Arapahoe
Delta
Sweitzer Lake S.P.
Kebler Pass 9980 ft.
Trout Creek Pass 9487 ft.
Florissant Fossil Beds Nat'l. Mon.
Pikes Peak 14110 ft.
Manitou Sprs.
Colorado Springs
Kit Carson
Gateway
Uncompahgre Nat'l. For.
Crawford
Gunnison Nat'l. For.
St. Elmo Ghost Town
Mt. Antero 14269 ft.
Arkansas Headwaters S.P.
Cripple Creek
Victor
Fountain
Olathe
Black Canyon of the Gunnison Nat'l. Park
Shavano Pk. 14229 ft.
Monarch Pass 11312 ft.
Royal Gorge Toll Bridge 1053 ft. above river
Cañon City
Fort Carson
Spruce Mtn. 9731 ft.
Montrose
Gunnison
Parlin
Salida
Poncha Sprs.
Texas Creek
Penrose
Haswell
Eads
Chivington
Sheridan Lake
Paradox
Uravan
Cimarron
Curecanti Nat'l. Rec. Area
Sargents
Poncha Pass 9012 ft.
Lincoln Park
Florence
Pueblo
Arlington
Chief Ouray St. Mon.
Nucla
Naturita
Ridgway S.P.
Ridgway
Sheep Mtn. 13168 ft.
North Pass 10149 ft.
Villa Grove
ROCKY MOUNTAINS
Wetmore
Lake Pueblo S.P.
Boone
Ordway
Sugar City
Wiley
Lamar
Granada
Holly
Norwood
Uncompahgre Pk. 14309 ft.
Ouray
Gunnison Nat'l. Forest
Saguache
Westcliffe
Silver Cliff
Avondale
Fowler
Manzanola
Las Animas
Bent's Old Fort N.H.S.
John Martin Reservoir S.P.
Gypsum Gap 6100 ft.
Placerville
Telluride Ski Area
Lake City
San Luis Pk. 14014 ft.
Rio Grande National Forest
Moffat
Crestone Pk. 14294 ft.
San Isabel
Rocky Ford
La Junta
Kit Carson Mus.
Telluride
Red Mtn. Pass 11075 ft.
Spring Creek Pass 10898 ft.
Creede
San Isabel Nat'l. Forest
Greenhorn Mtn. 12347 ft.
Colorado City
Timpas
Lizard Head Pass 10222 ft.
Dove Creek
Silverton
Center
Great Sand Dunes Nat'l. Pk. and Pres.
Gardner
Farisita
Rico
South Fork
Hooper
Red Wing
Cahone
Pleasant View
Canyons of the Ancients Nat'l. Mon.
Coal Bank Pass 10640 ft.
Sunlight Pk. 14059 ft.
San Juan Nat'l. For.
Del Norte
Mosca
San Luis S.P.
Lathrop S.P.
Walsenburg
Delhi
Two Buttes
Dolores
Durango Mountain Ski Resort
Monte Vista
Alamosa
Blanca Pk. 14345 ft.
N. La Veta Pass 9413 ft.
Tyrone
Springfield
Walsh
Hackberry Group
Goodman Point
Cutthroat Castle
Mancos S.P.
Vallecito Res.
Wolf Creek Pass 10850 ft.
Wolf Creek Ski Area
Fort Garland
Aguilar
Model
Cortez
Mancos
Durango
Durango-Silverton Narrow Gauge R.R.
Pagosa Sprs.
Capulin
Cuchara
Cucharas Pass 9941 ft.
Ludlow
Pritchett
Stonington
Hovenweep Nat'l. Mon.
Towaoc
Mesa Verde Nat'l. Park
Cliff Dwellings
Hesperus
Bayfield
Pikes Stockade St. Hist. Mon.
La Jara
Romeo
San Acacio
San Luis
Trinidad Lake S.P.
Trinidad
Kim
Campo
Ute Mtn. Ute Res.
Southern Ute Ind. Res.
Ignacio
Arboles
Navajo S.P.
La Manga Pass 10230 ft.
Chromo
Cumbres and Toltec Scenic R.R.
Manassa
Conejos
Antonito
Culebra Pk. 14047 ft.
Weston
Starkville
Old Baca House and Pioneer Mus. St. Hist. Mon.
Branson
Four Corners Mon.
Carson
Dulce
Raton Pass
Black Mesa 4973 ft.

Parks / recreation maps

~1960s / 70s ->
more addition of Shaded relief



Post 1950: Tactile mapping for the visually impaired



http://www.davidrumsey.com

Next - History of mapping II (1975->): digital developments