Beef Production Strategies that Optimize the Use of Western Rangelands

Presented to:

Burton K. Wheeler Center

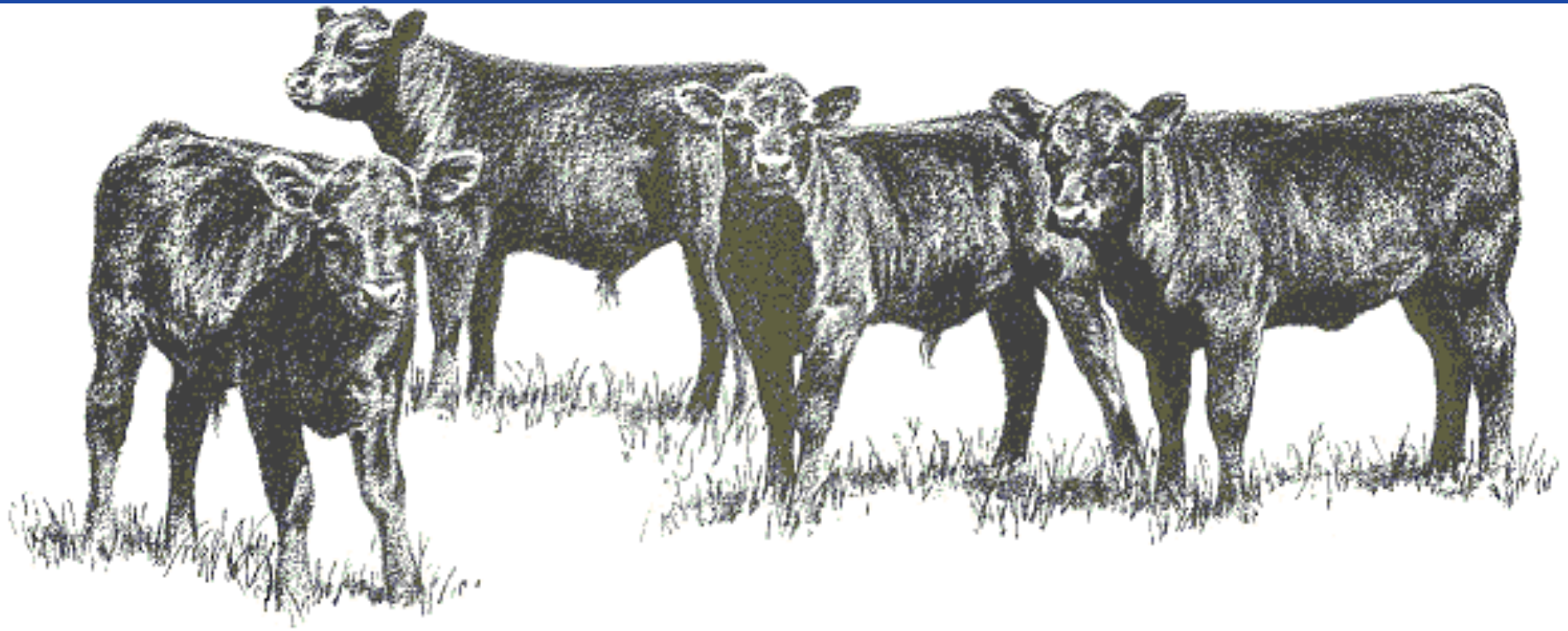
Oct. 2nd , 2019

Tim DelCurto
Professor & Nancy Cameron Chair

US Beef Cattle Industry (2018):

- Average Age of principle beef cattle rancher = 58.3 years
- 727,906 beef cattle farms/ranches (91% are family owned)
    - Average herd size is 40 cows
- 26,586 cattle feedlot operations (80% are family owned)
- 64,098 dairy cow operations

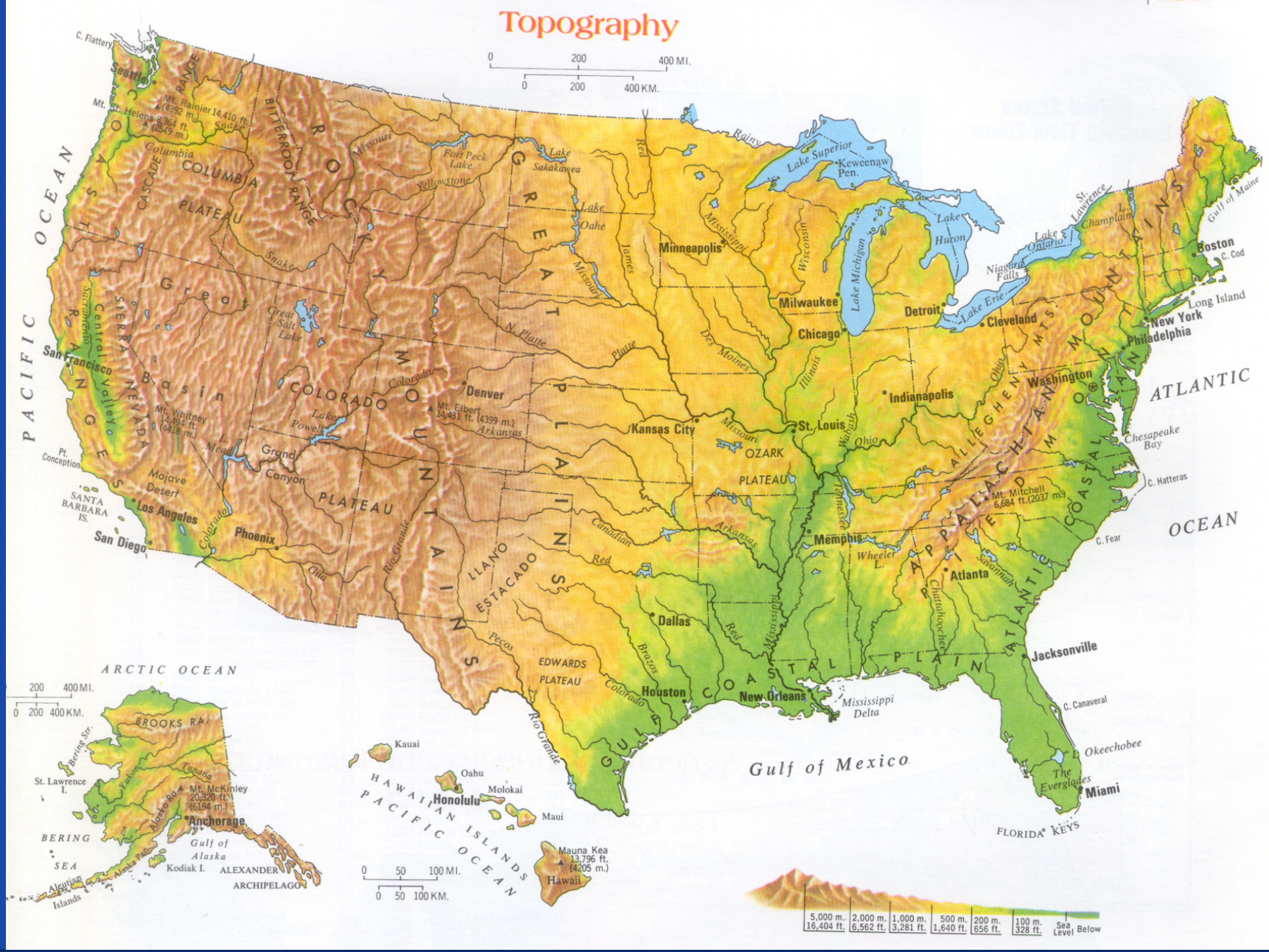
National Cattleman's Beef Association (NCBA beef industry statistics)
https://www.ncba.org/CMDocs/BeefUSA/Publications/CattleFaxSection.pdf

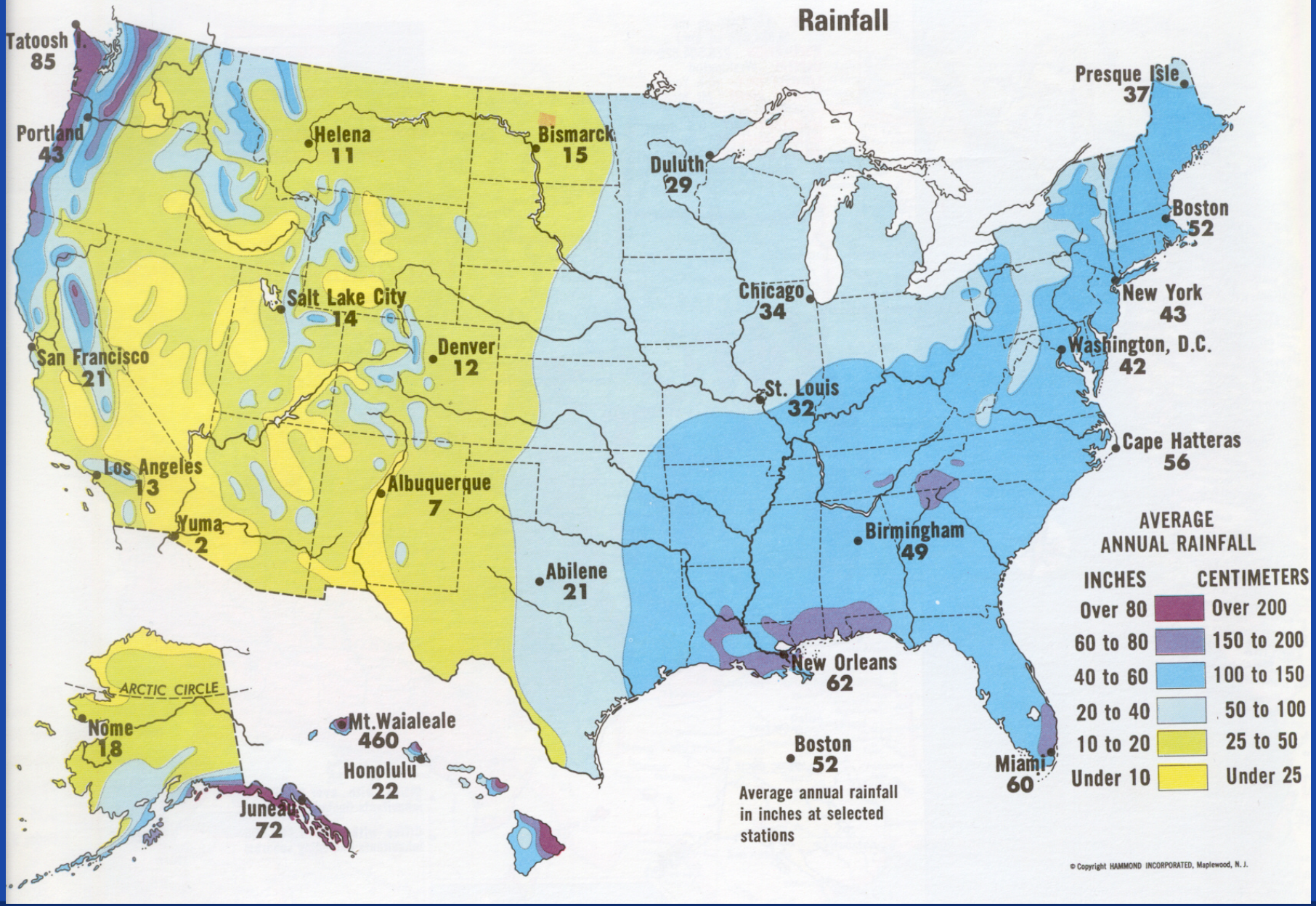


Montana Beef Industry

- Agriculture is Montana's leading industry
- # 7 in US Beef Females (1.5 million hd)
- #1 Seedstock Producing State (Angus)
  - 20% of the Angus Bull in the US
- Animal Agriculture is top commodity:
  - $2,152,403,000
- 27,500 Farms and Ranches
  - Generating at least $1000 in annual sales
- Dominated by extensive beef production systems.

Land & Forage Resources in the Western US


Topography
0 200 400 MI.
0 200 400 KM.
PACIFIC OCEAN
ATLANTIC OCEAN
Gulf of Mexico
ARCTIC OCEAN
C. Flattery
Seattle
Mt. St. Helens 8,364 ft. (2549 m.)
Mt. Rainier 14,410 ft. (4392 m.)
CASCADE RANGE
COLUMBIA PLATEAU
BITTERROOT RANGE
ROCKY MOUNTAINS
Columbia
Snake
Missouri
Fort Peck Lake
Yellowstone
Lake Sakakawea
Red
Rainy
Lake Superior
Keweenaw Pen.
Lake Oahe
James
Minneapolis
Mississippi
Wisconsin
Lake Michigan
Lake Huron
St. Lawrence
Lake Champlain
Lake Ontario
Niagara Falls
Gulf of Maine
Boston
C. Cod
Long Island
New York
Philadelphia
Milwaukee
Detroit
Lake Erie
Cleveland
Chicago
GREAT PLAINS
Great Salt Lake
N. Platte
Platte
Des Moines
Illinois
Ohio
Washington
Indianapolis
ALLEGHENY MTS.
APPALACHIAN MOUNTAINS
Great Basin
SIERRA NEVADA
Central Valley
Sacramento
San Francisco
Pt. Conception
Mt. Whitney 14,494 ft. (4418 m.)
Lake Mead
Lake Powell
Colorado
Denver
Mt. Elbert 14,431 ft. (4399 m.)
Arkansas
COLORADO PLATEAU
Kansas City
Missouri
St. Louis
Ohio
Wabash
OZARK PLATEAU
Tennessee
Chesapeake Bay
C. Hatteras
Grand Canyon
Mojave Desert
SANTA BARBARA IS.
Los Angeles
San Diego
Phoenix
Rio Grande
Canadian
Memphis
Wheeler L.
Mt. Mitchell 6,684 ft. (2037 m.)
C. Fear
Atlanta
Savannah
Chattahoochee
Red
Mississippi
LLANO ESTACADO
Dallas
Pecos
EDWARDS PLATEAU
Brazos
Houston
New Orleans
Mississippi Delta
ATLANTIC COASTAL PLAIN
Jacksonville
C. Canaveral
Okeechobee
The Everglades
Miami
FLORIDA KEYS
BROOKS RA.
Bering Str.
St. Lawrence I.
Yukon
Tanana
Mt. McKinley 20,320 ft. (6194 m.)
Alaska Rd.
Anchorage
Gulf of Alaska
BERING SEA
Kodiak I.
ALEXANDER ARCHIPELAGO
Aleutian Islands
Kauai
Oahu
Honolulu
Molokai
Maui
HAWAIIAN ISLANDS
Mauna Kea 13,796 ft. (4205 m.)
Hawaii
0 50 100 MI.
0 50 100 KM.
5,000 m. 16,404 ft.
2,000 m. 6,562 ft.
1,000 m. 3,281 ft.
500 m. 1,640 ft.
200 m. 656 ft.
100 m. 328 ft.
Sea Level
Below


Rainfall
Tatoosh I. 85
Portland 43
Helena 11
Bismarck 15
Duluth 29
Presque Isle 37
Boston 52
Chicago 34
New York 43
Salt Lake City 14
Denver 12
San Francisco 21
Washington, D.C. 42
St. Louis 32
Cape Hatteras 56
Los Angeles 13
Albuquerque 7
Yuma 2
Birmingham 49
Abilene 21
New Orleans 62
ARCTIC CIRCLE
Nome 18
Mt. Waialeale 460
Honolulu 22
Juneau 72
Boston 52
Miami 60
Average annual rainfall in inches at selected stations
AVERAGE ANNUAL RAINFALL
INCHES
CENTIMETERS
Over 80
Over 200
60 to 80
150 to 200
40 to 60
100 to 150
20 to 40
50 to 100
10 to 20
25 to 50
Under 10
Under 25
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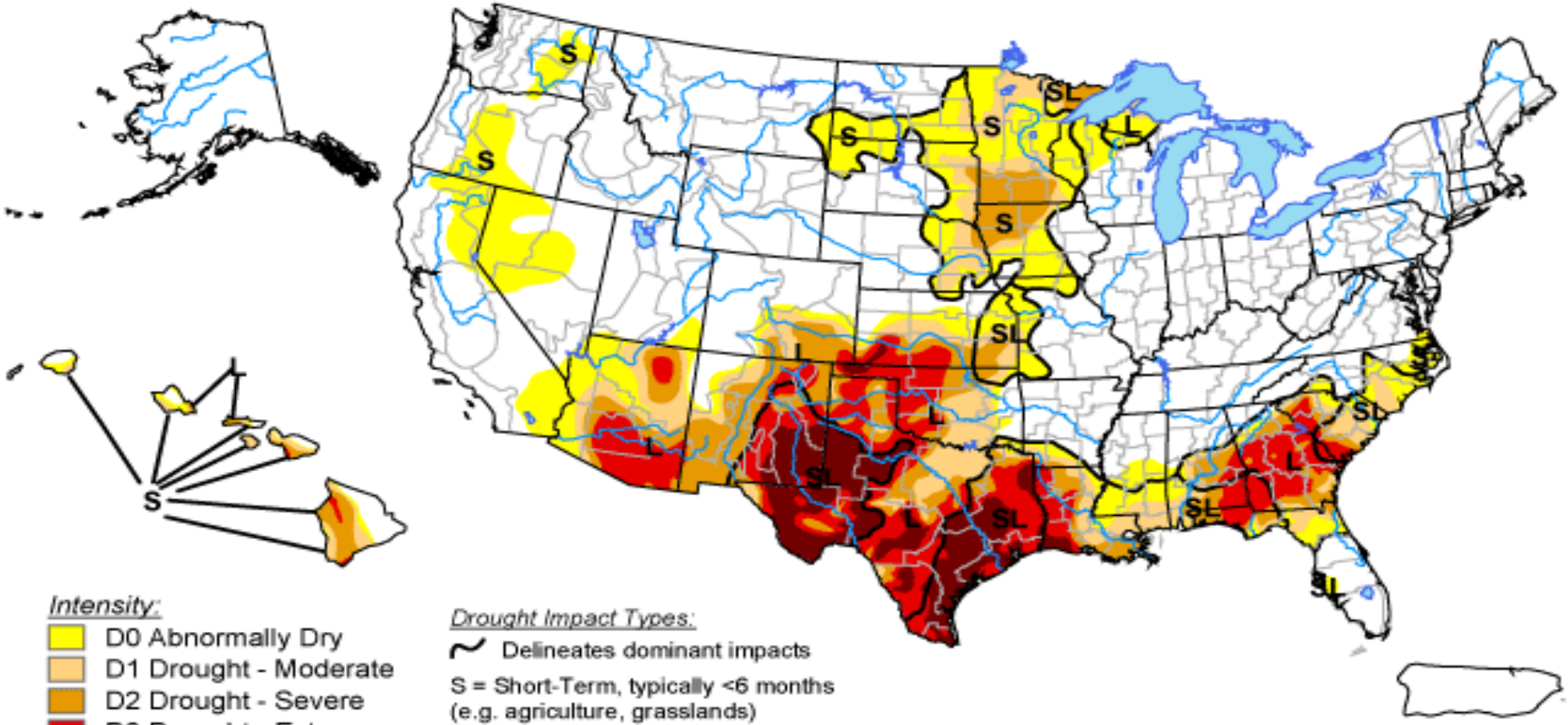
U.S. Drought Monitor

December 13, 2011
Valid 7 a.m. EST



Intensity:
- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

~ Delineates dominant impacts

S = Short-Term, typically <6 months (e.g. agriculture, grasslands)

L = Long-Term, typically >6 months (e.g. hydrology, ecology)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://droughtmonitor.unl.edu/

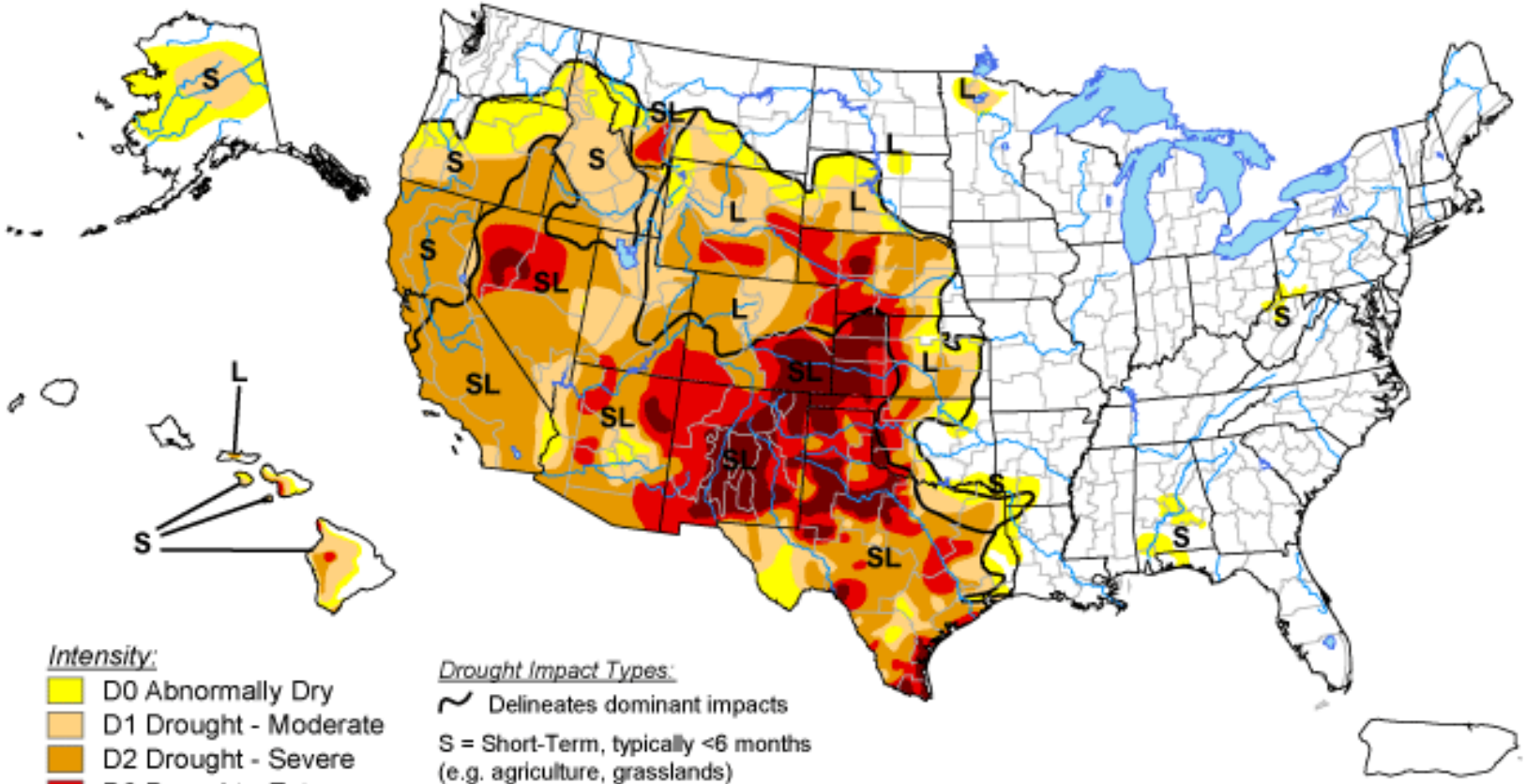
USDA | National Drought Mitigation Center

Released Thursday, December 15, 2011

Author: Matthew Rosencrans, NOAA/NWS/NCEP/CPC

U.S. Drought Monitor

July 2, 2013
Valid 7 a.m. EDT



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http://droughtmonitor.unl.edu/

Released Wednesday, July 3, 2013

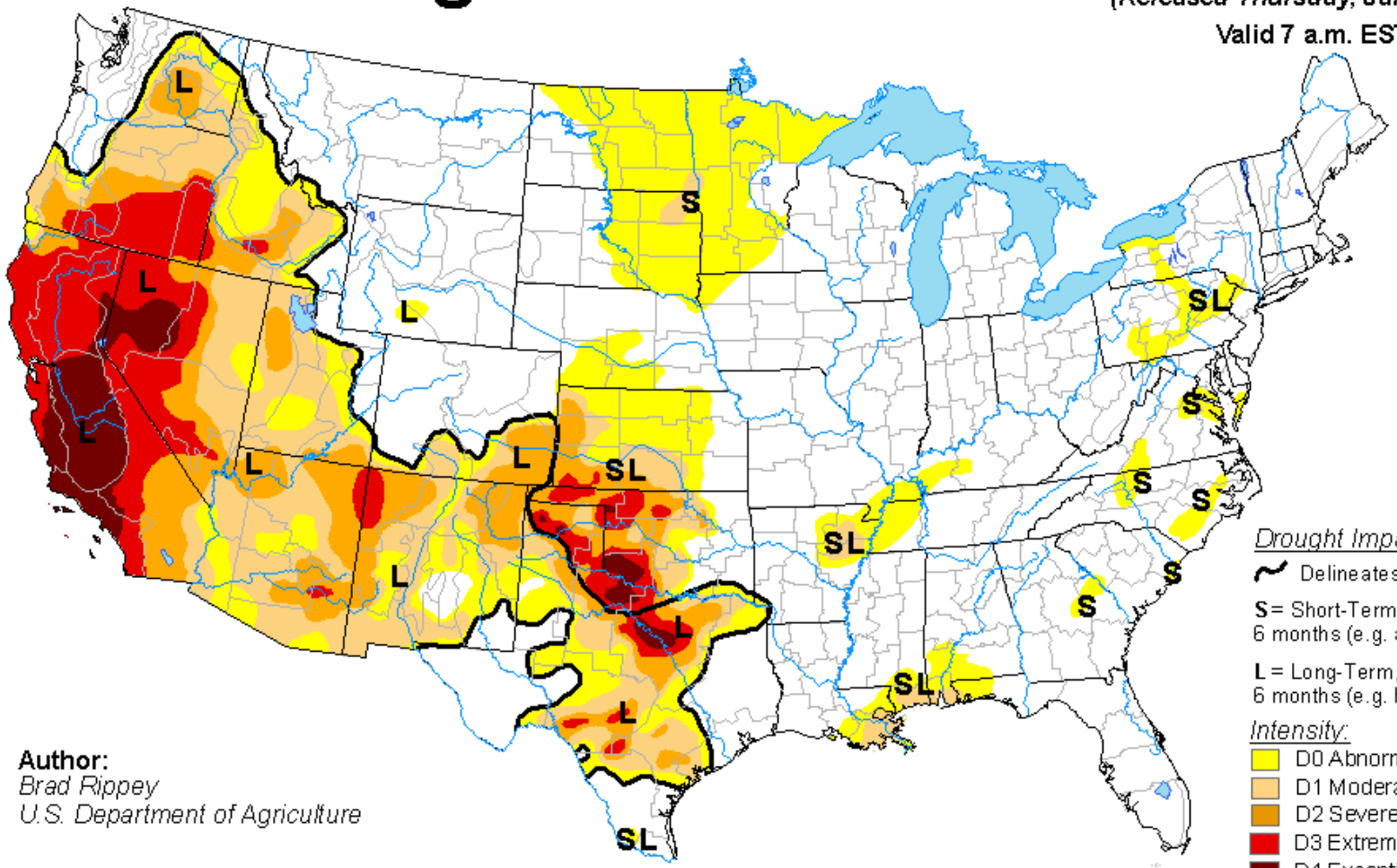
Author: Matthew Rosencrans, NOAA/NWS/NCEP/CPC

U.S. Drought Monitor

January 6, 2015

(Released Thursday, Jan. 8, 2015)

Valid 7 a.m. EST



Author:
Brad Rippey
U.S. Department of Agriculture

Drought Impact Types:

Delineates dominant impacts

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Intensity:

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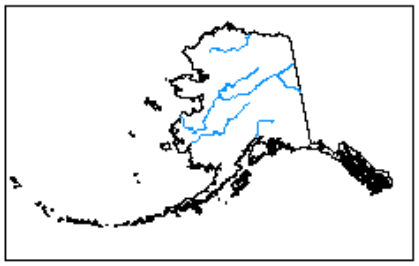
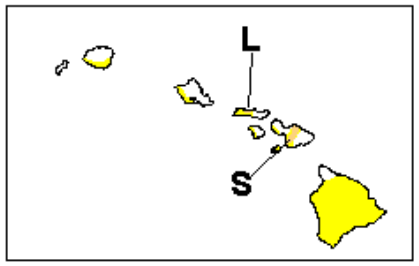
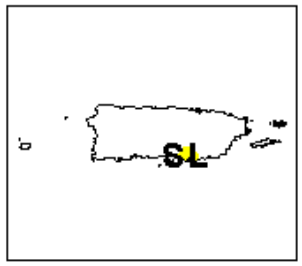






USDA

National Drought Mitigation Center

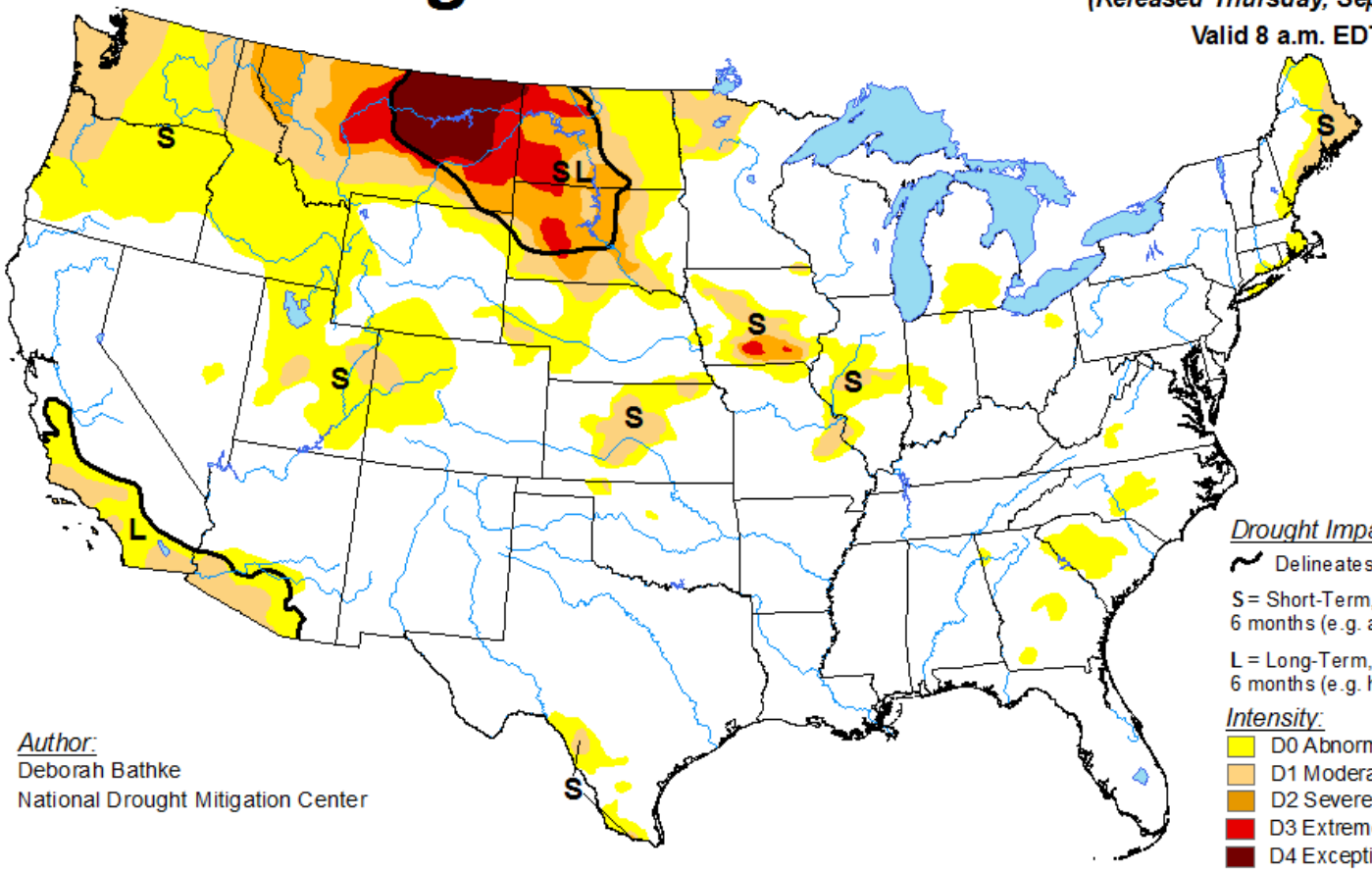
http://droughtmonitor.unl.edu/

U.S. Drought Monitor

September 5, 2017

(Released Thursday, Sep. 7, 2017)

Valid 8 a.m. EDT



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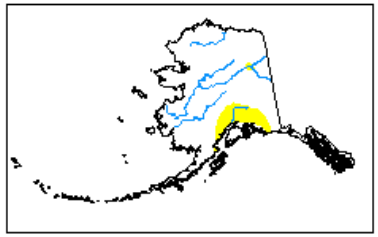
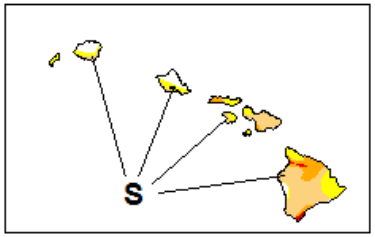
Author:
Deborah Bathke
National Drought Mitigation Center





USDA NDMC NOAA

http://droughtmonitor.unl.edu/

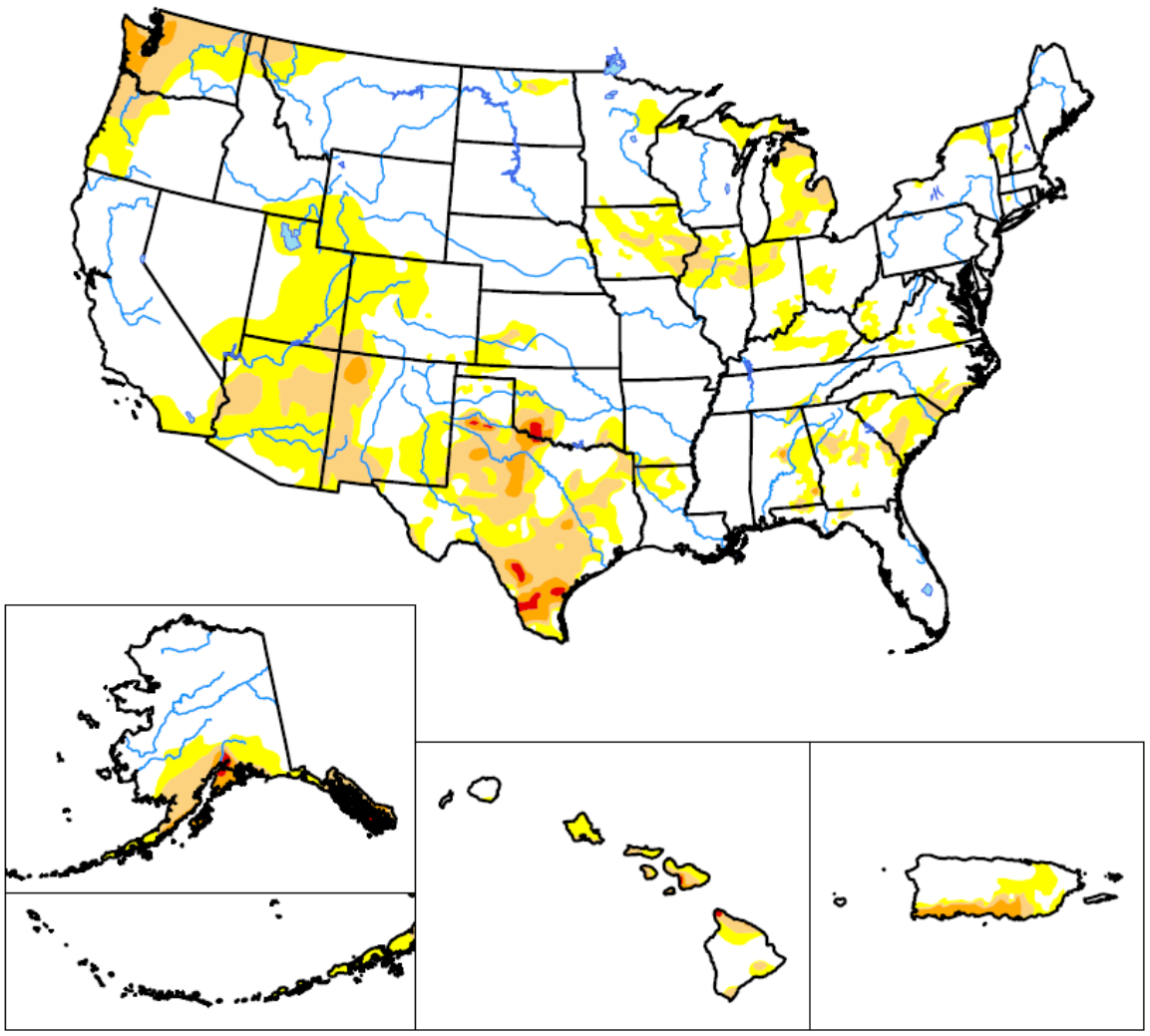
U.S. Drought Monitor

U.S. States and Puerto Rico

September 3, 2019

(Released Thursday, Sep. 5, 2019)

Valid 8 a.m. EDT



Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

David Miskus
NOAA/NWS/NCEP/CPC

droughtmonitor.unl.edu

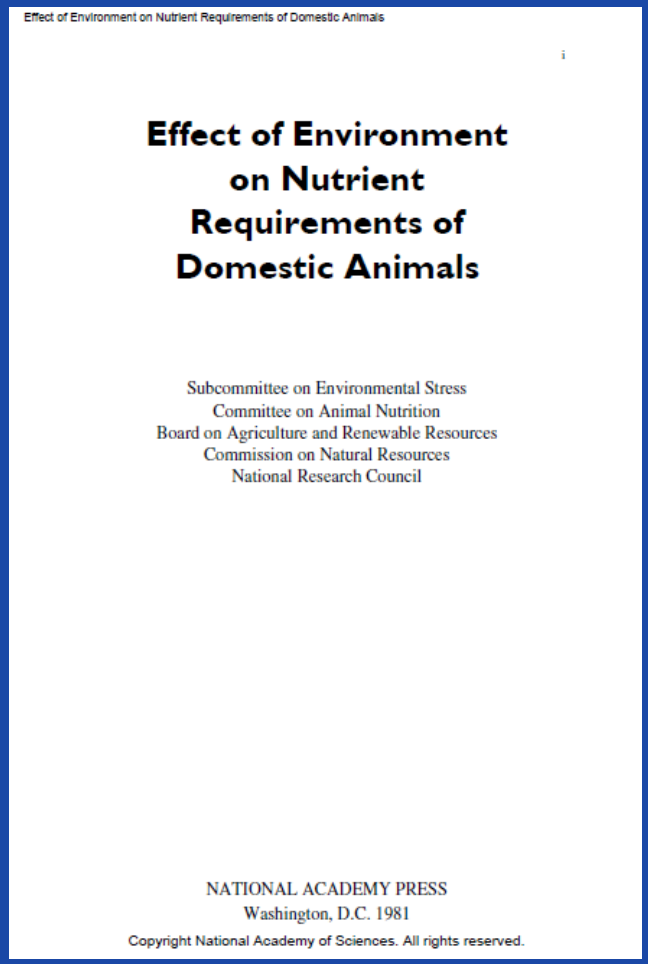
Balancing Multiple Values:

- Manage for “ecological function”
  - Water optimization .. “the safe capture, storage, and release of water”
  - Soils and nutrient retention
  - Manage disturbance to optimize the above qualities
  - Optimize energy cycles .. Vegetation production

Montana Winter of 2017-2018 & 2018-2019

Environment and Nutrient Requirements

- Most of the models for environment are based on 1981 NRC Publication
- Most are focused on energy requirements
  - Protein, minerals & vitamins?
- Relate to temperature and hair coat
  - Limited in respect to precipitation and/or wind conditions
    - Wind Chill equivalent?

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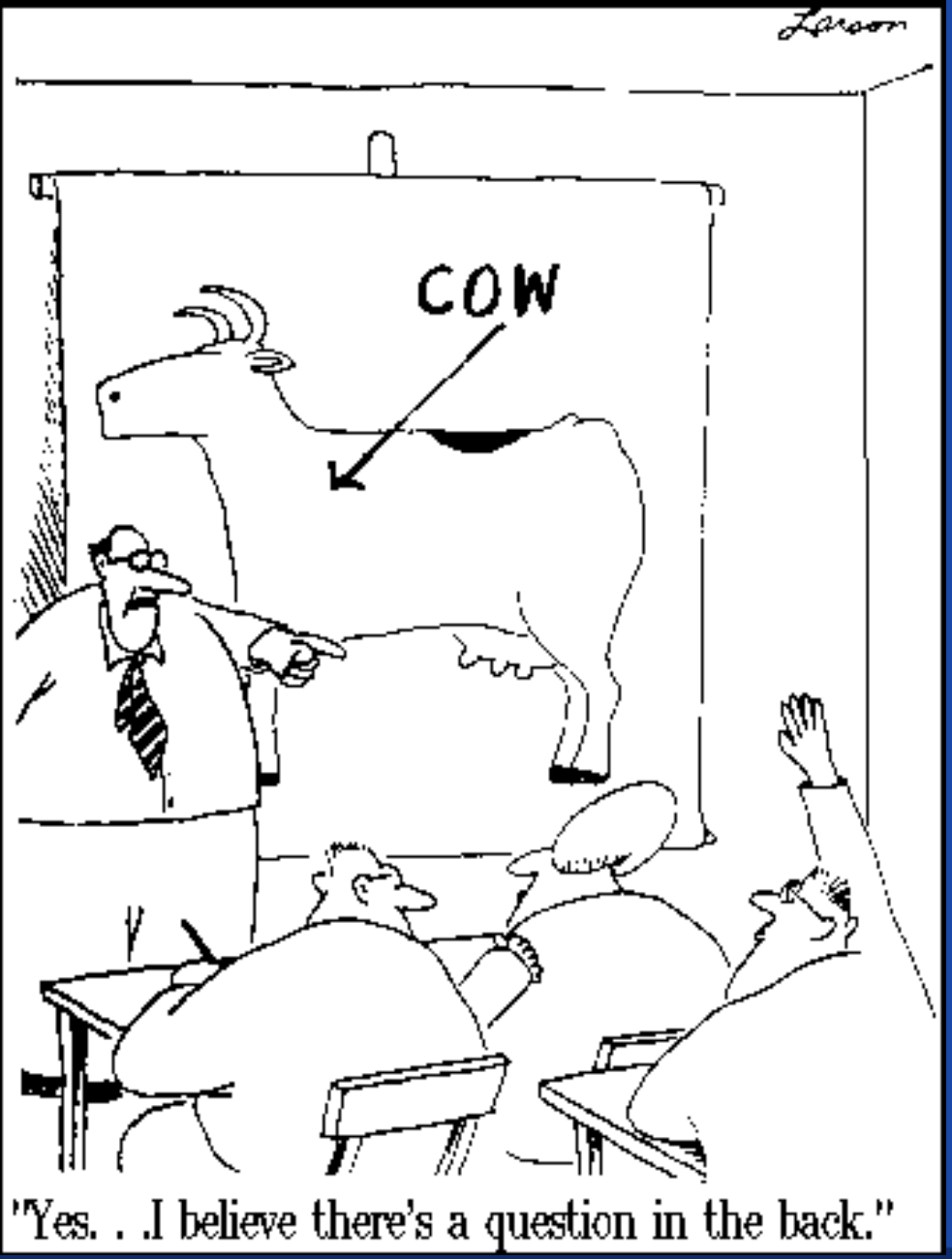
Weak Calf Syndrome

- ***Definition:*** Calves that are born alive, normal appearance, but lack the vigor to stand and nurse
  - Google Scholar Search = 79,200 hits
  - Has been related to multiple factors
    - Nutrition
      - Protein is critical
      - Minerals & Vitamins
    - Environment
      - Cold, wet and wind increase requirements
    - Dystocia = “difficulties at birth”
    - Disease
    - Other cow/calf factors

Final Thoughts:

- Beef Production Systems Research
  - Optimizing Ranch and Rangeland Forages Use
  - Cow type matched with environment



Thank You!

Questions?