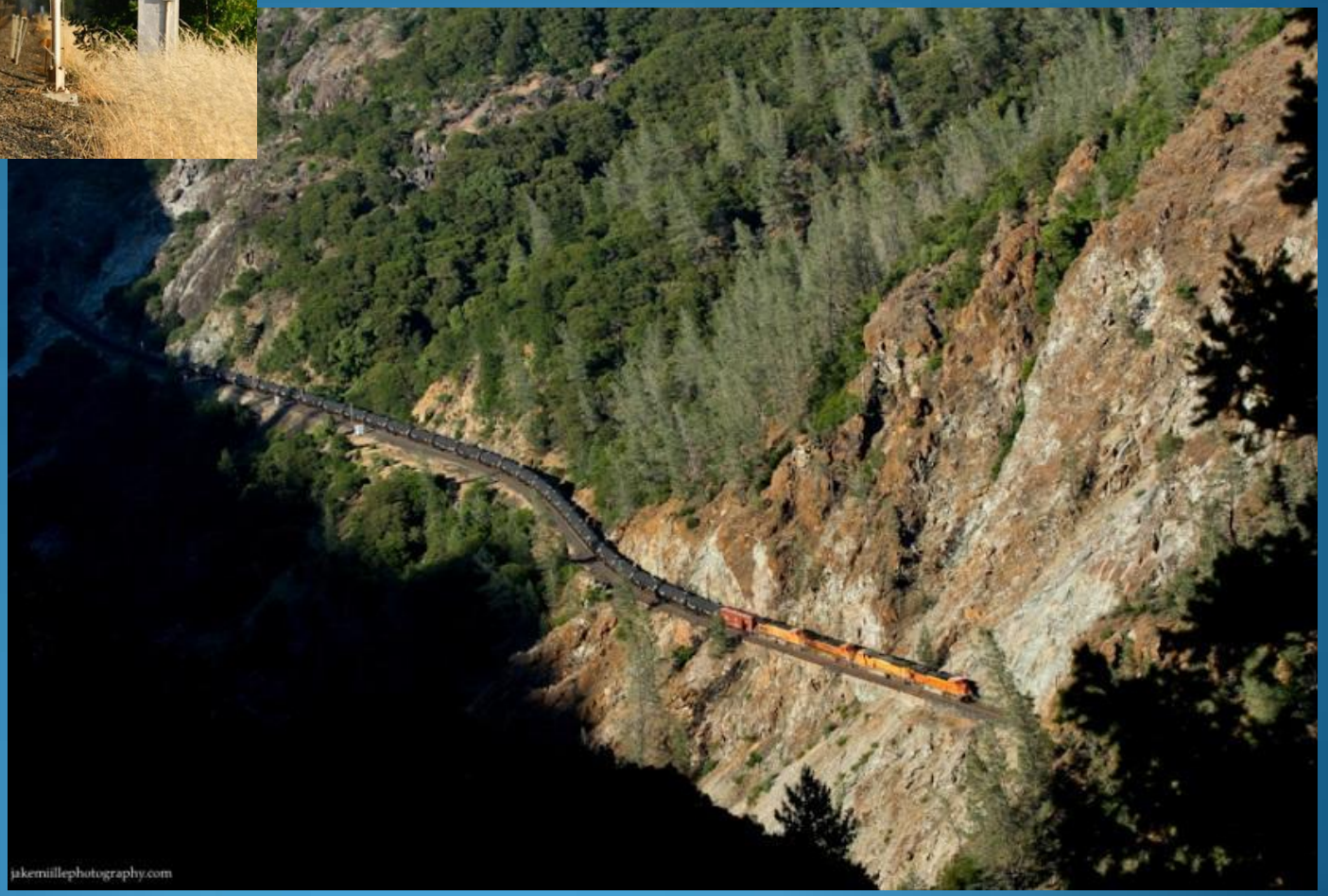
Light Crude Oil, Transport by Rail

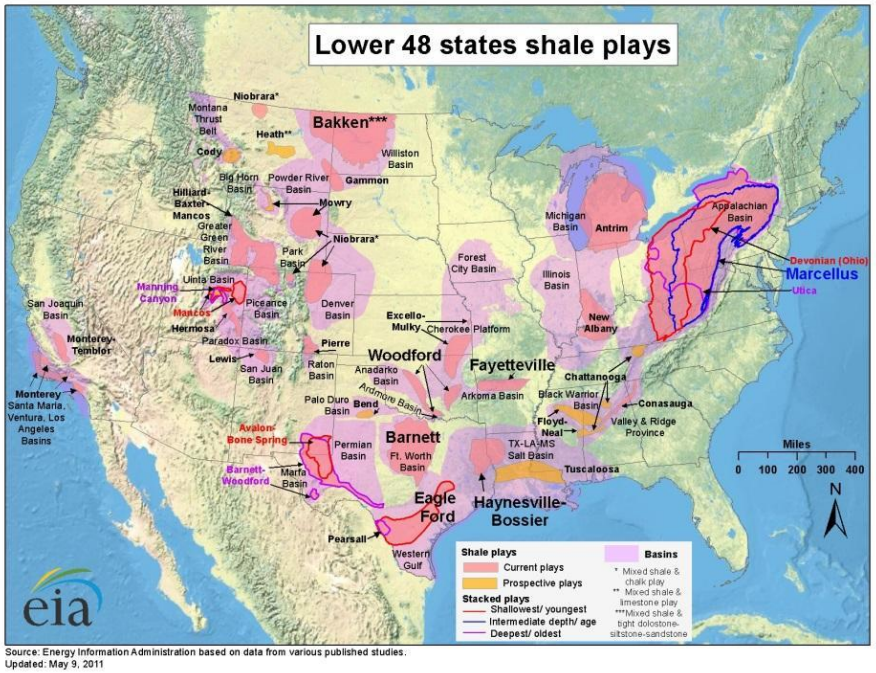


Butte County
• CALIFORNIA •

Prepared for the Butte County Board of Supervisors

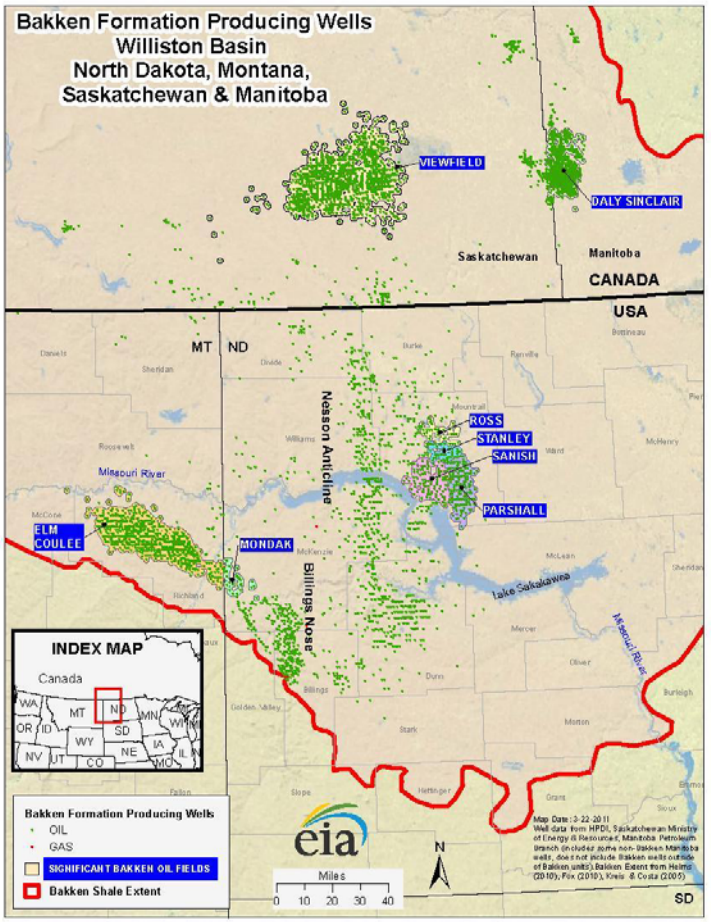
Where does Light Crude come from?

- Various Regions
  - West Texas Intermediate
    - Benchmark



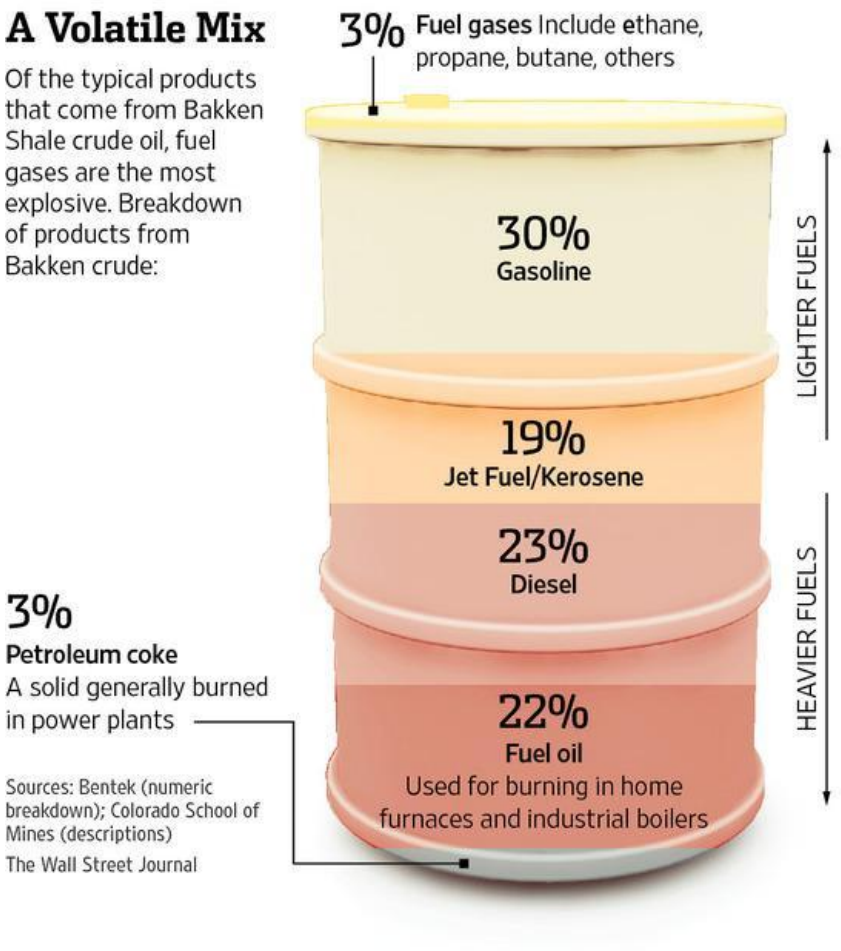
Source: Energy Information Administration based on data from various published studies.
Updated: May 9, 2011

- Bakken Region



What is Bakken Crude?

- Light "sweet" shell crude oil
  - High quality
    - Low sulfur
  - Flammable

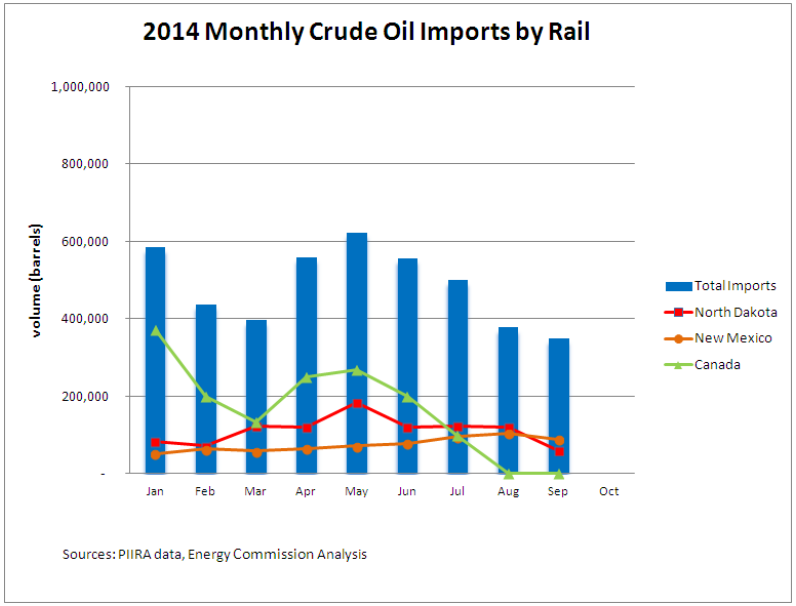


How is oil transported?

- Pipeline
- Rail
- Barge
- Truck

CA oil imports

- 2012 and prior
  - 70% by marine
  - 1,000 bbl (.3%) by rail
- 2013
  - 6.3 million bbl by rail
- By 2016
  - Estimate 150 million bbl by rail



Where is it going in California?

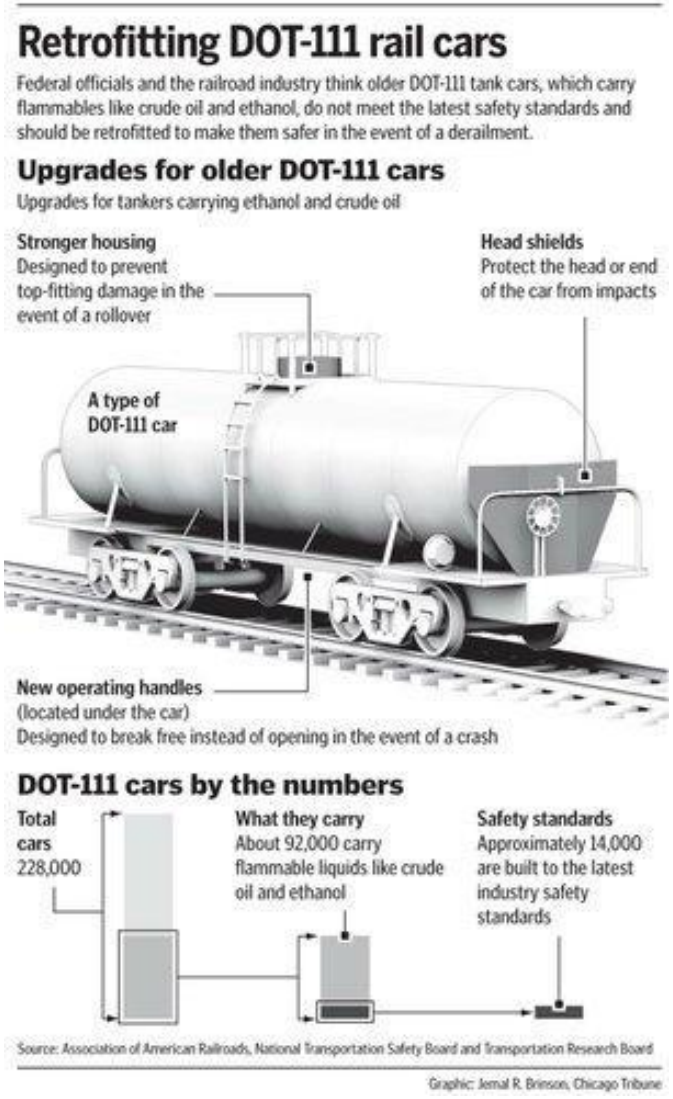
- Benecia
- Martinez
- Bakersfield
- SoCal

Accidents: Oil by Rail

- More crude oil spilled in 2013 than last 4 decades
  - Mostly small spills
  - Potential for high-consequences will increase
- Lac-Megantic, Quebec
  - 63 tank cars exploded
    - Killed 47
- 8 significant derailments in US 2013-2014
  - No injuries

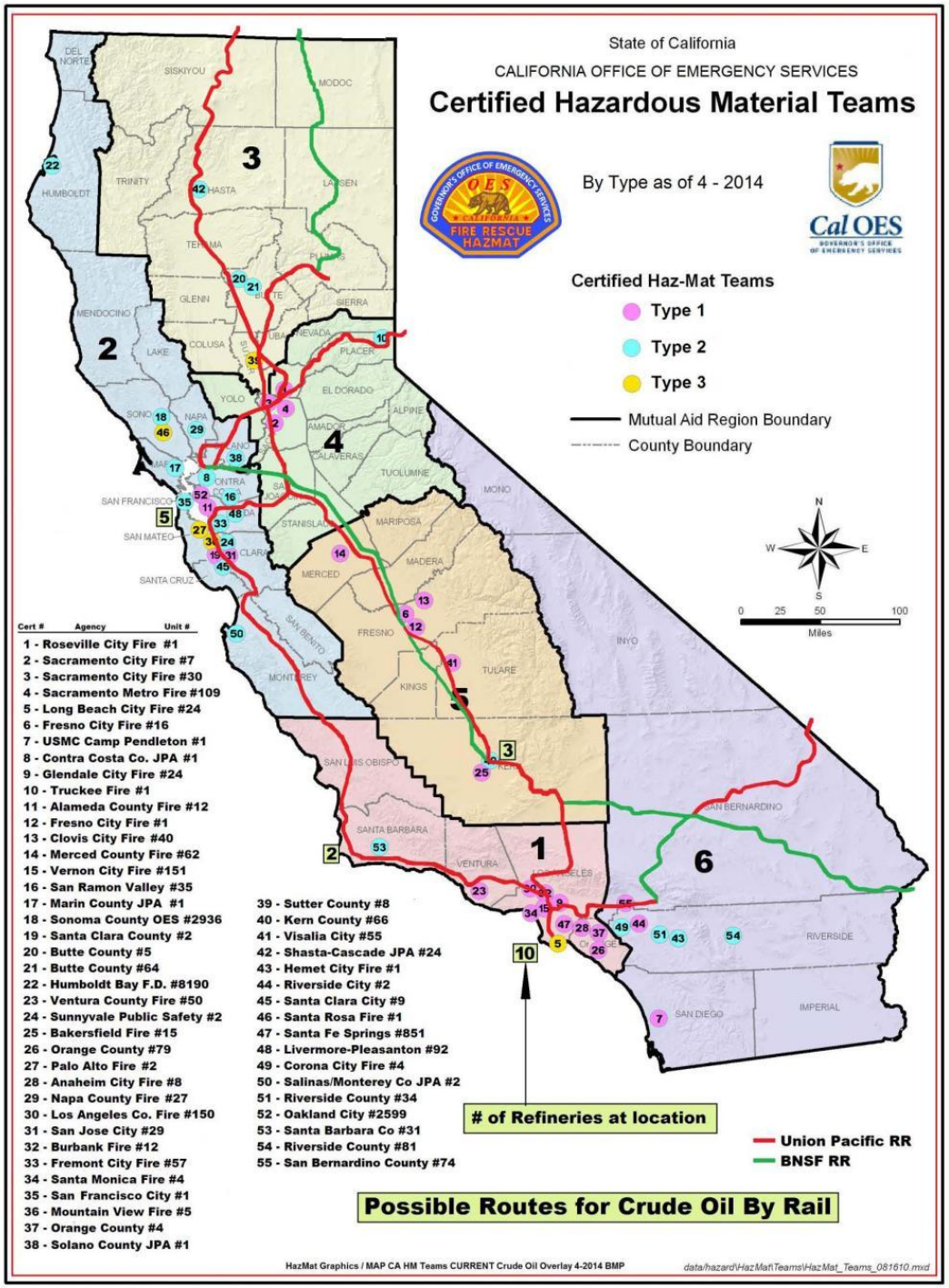
Accidents: Oil by Rail

- Why all the accidents?
  - Under investigation
  - DOT111 tank cars easily damaged?
    - Not designed for pressure, etc.
  - Increased volume of trains?



Routes/Risks: Butte County

- Feather River Route
  - Significant Natural Resource Risk


State of California
CALIFORNIA OFFICE OF EMERGENCY SERVICES
Certified Hazardous Material Teams
By Type as of 4 - 2014
Cal OES
Certified Haz-Mat Teams
Type 1
Type 2
Type 3
Mutual Aid Region Boundary
County Boundary
N
W
E
S
0 25 50 100
Miles
Cert # Agency Unit #
1 - Roseville City Fire #1
2 - Sacramento City Fire #7
3 - Sacramento City Fire #30
4 - Sacramento Metro Fire #109
5 - Long Beach City Fire #24
6 - Fresno City Fire #16
7 - USMC Camp Pendleton #1
8 - Contra Costa Co. JPA #1
9 - Glendale City Fire #24
10 - Truckee Fire #1
11 - Alameda County Fire #12
12 - Fresno City Fire #1
13 - Clovis City Fire #40
14 - Merced County Fire #62
15 - Vernon City Fire #151
16 - San Ramon Valley #35
17 - Marin County JPA #1
18 - Sonoma County OES #2936
19 - Santa Clara County #2
20 - Butte County #5
21 - Butte County #64
22 - Humboldt Bay F.D. #8190
23 - Ventura County Fire #50
24 - Sunnyvale Public Safety #2
25 - Bakersfield Fire #15
26 - Orange County #79
27 - Palo Alto Fire #2
28 - Anaheim City Fire #8
29 - Napa County Fire #27
30 - Los Angeles Co. Fire #150
31 - San Jose City #29
32 - Burbank Fire #12
33 - Fremont City Fire #57
34 - Santa Monica Fire #4
35 - San Francisco City #1
36 - Mountain View Fire #5
37 - Orange County #4
38 - Solano County JPA #1
39 - Sutter County #8
40 - Kern County #66
41 - Visalia City #55
42 - Shasta-Cascade JPA #24
43 - Hemet City Fire #1
44 - Riverside City #2
45 - Santa Clara City #9
46 - Santa Rosa Fire #1
47 - Santa Fe Springs #851
48 - Livermore-Pleasanton #92
49 - Corona City Fire #4
50 - Salinas/Monterey Co JPA #2
51 - Riverside County #34
52 - Oakland City #2599
53 - Santa Barbara Co #31
54 - Riverside County #81
55 - San Bernardino County #74
# of Refineries at location
Union Pacific RR
BNSF RR
Possible Routes for Crude Oil By Rail
HazMat Graphics / MAP CA HM Teams CURRENT Crude Oil Overlay 4-2014 BMP
data/hazard\HazMat\Teams\HazMat_Teams_081610.mxd

DOT Regulations

- SERC notification, light crude
  - 1,000,000+ gallons on any train
    - About 33-34 tank cars
    - Route of the train

Preparedness/Prevention

- Knowledge
- Specialized training
- Real-time shipping info from railroads
- Enhanced tools/equipment
- Improve ID for responders
- Phase out old tank cars
- New accident prevention technology
  - Change braking systems/Avoidance technology
- Lower Speeds

What we can do?