A Case for the National Grid

Xavier Irias, P.E.

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quadrant            3/1
.   .   .   .   .   .   .   .     condition  GREEN
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.   .   .   .   .   .   .   .
.   .   .   .   .   .   .   .
.   .   .   .   .   .   *   .     torpedoes     10
*   .   .   .   .   .   .   *        energy   1815
.   .   .   .   .   .   .   .       shields   1000
.   . -E- .   *   .   .   .      klingons     17
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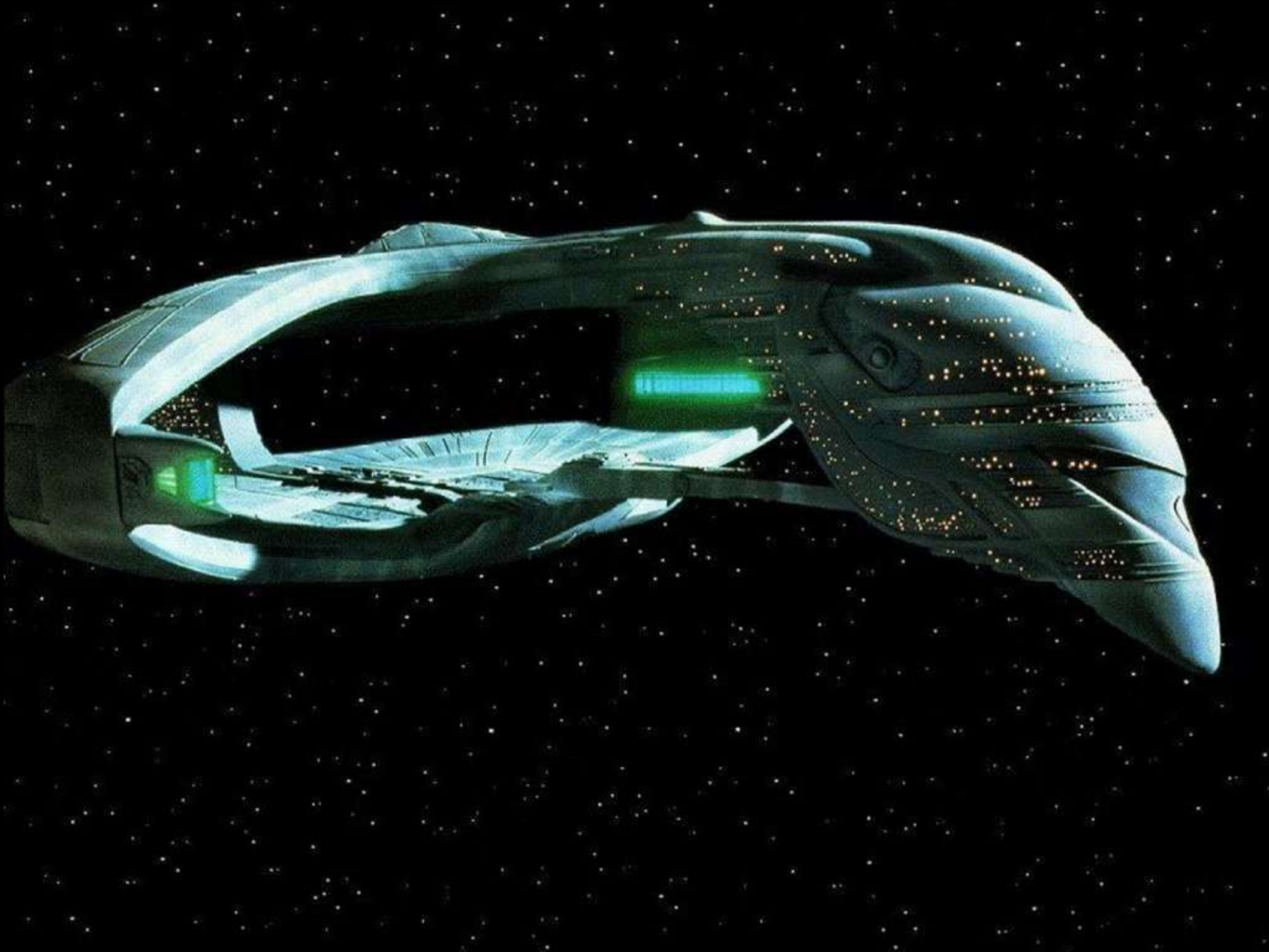
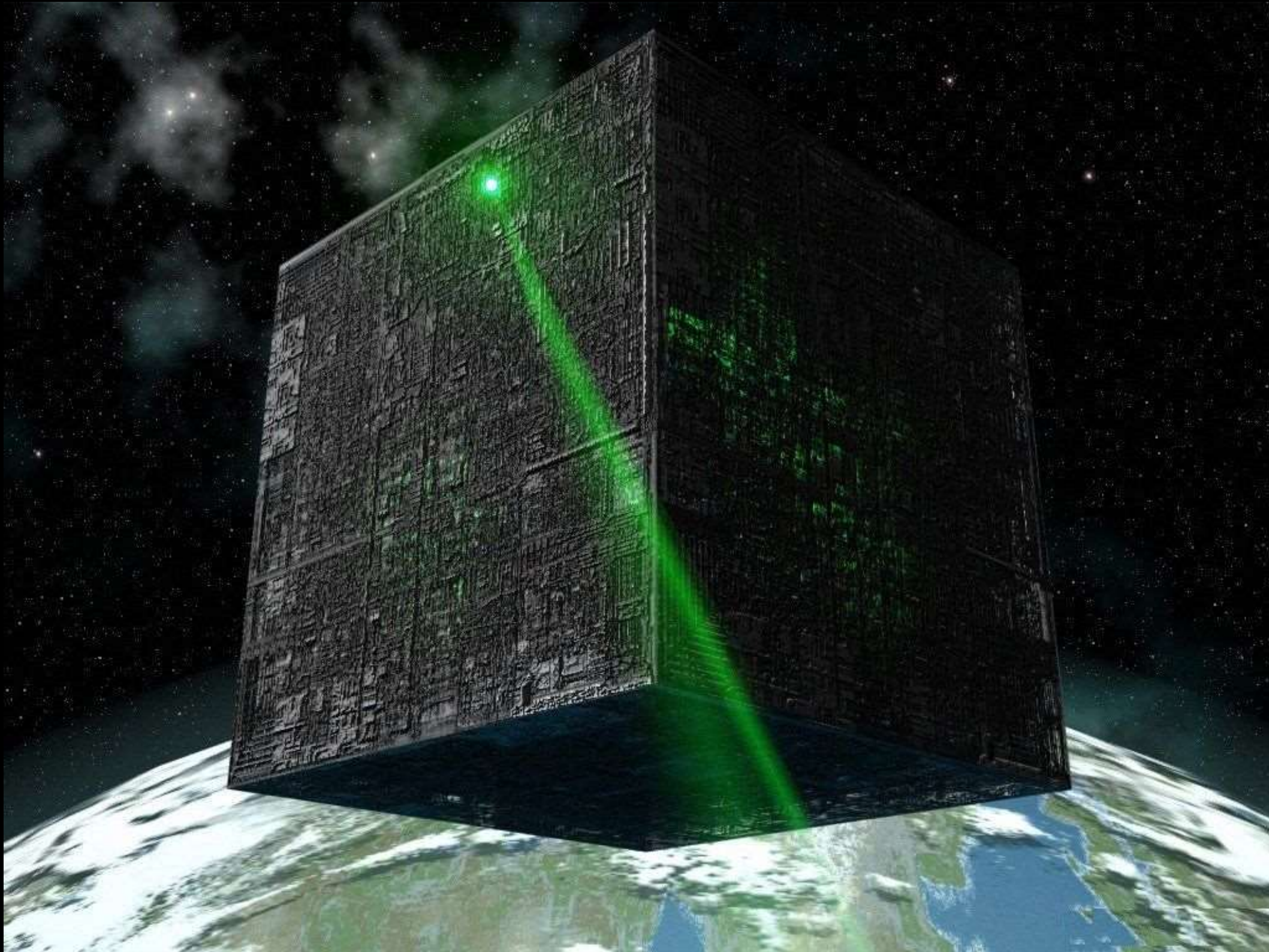
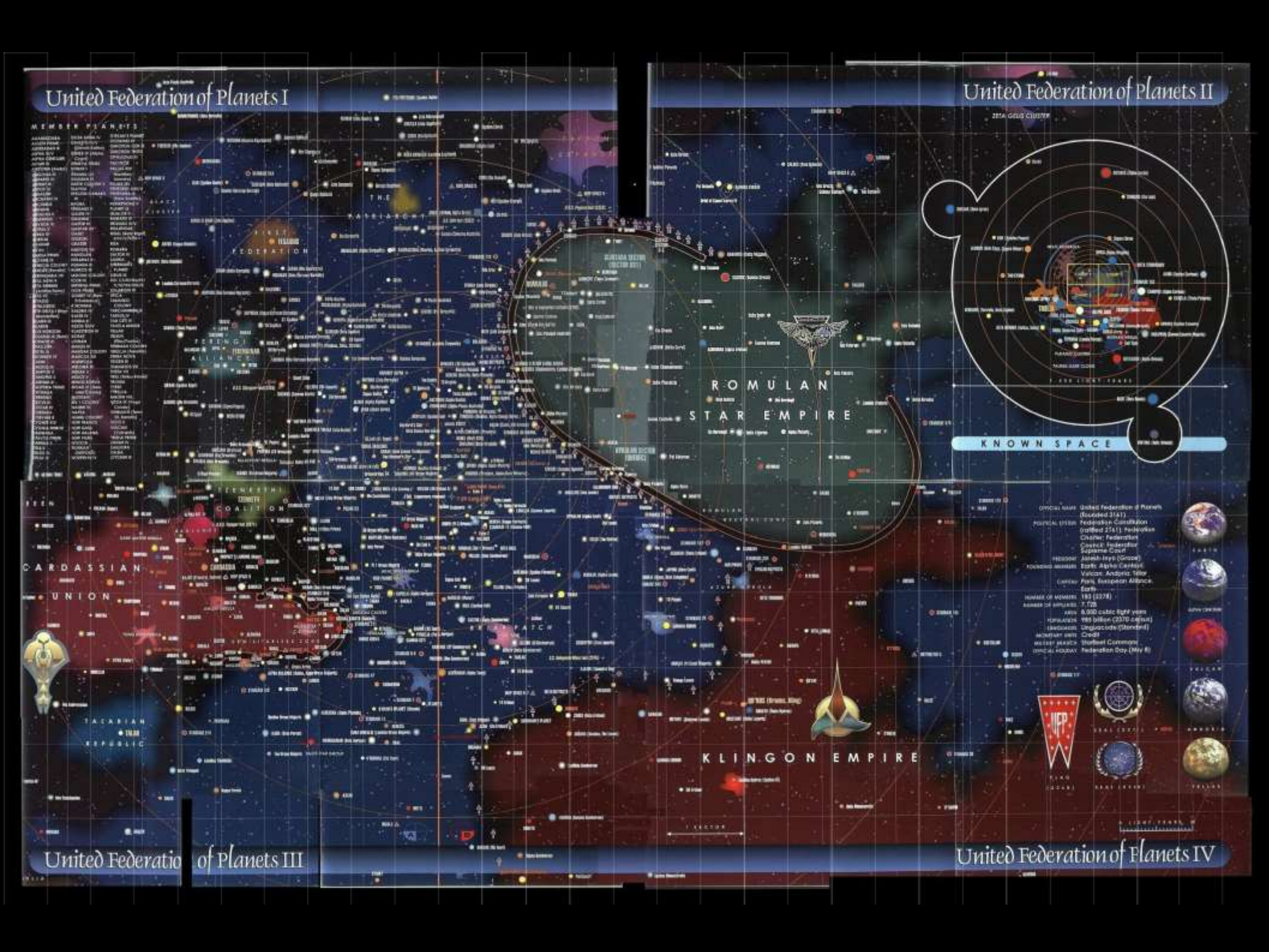
command:






United Federation of Planets I
United Federation of Planets II
United Federation of Planets III
United Federation of Planets IV
ROMULAN STAR EMPIRE
KLINGON EMPIRE
KNOWN SPACE
CARDASSIAN UNION
TALARIAN REPUBLIC
MEMBER PLANETS
ZETA GEUS CLUSTER
OFFICIAL NAME United Federation of Planets (Founded 2161)
POLITICAL SYSTEM Federation Constitution (ratified 2161); Federation Charter; Federation Council; Federation Supreme Court
PRESIDENT Jaresh-Inyo (Grazer)
FOUNDING MEMBERS Earth; Alpha Centauri; Vulcan; Andoria; Tellar
CAPITAL Paris, European Alliance, Earth
NUMBER OF MEMBERS 193 (2378)
NUMBER OF SPLINTERS 7,128
AREA 8,000 cubic light years
POPULATION 985 billion (2370 census)
LANGUAGES Unguacode (Standard)
MONETARY UNITS Credit
MILITARY BRANCH Starfleet Command
OFFICIAL HOLIDAY Federation Day (May 8)

Everybody Knows There are Good Reasons to Have a Standard Grid…

Everybody Knows There are Good Reasons to Have a Standard Grid…

Plenty of Use Cases for Emergency Planning & Response

- Printed emergency response maps
- Human-to-human communications, e.g. over phone or radio
- Data entry of position
- Position, navigation in the field
  - With paper maps
  - With GPS

Grids Promote Interoperability among Humans, Computers, Paper

Three equally common phenomena:

unicorn

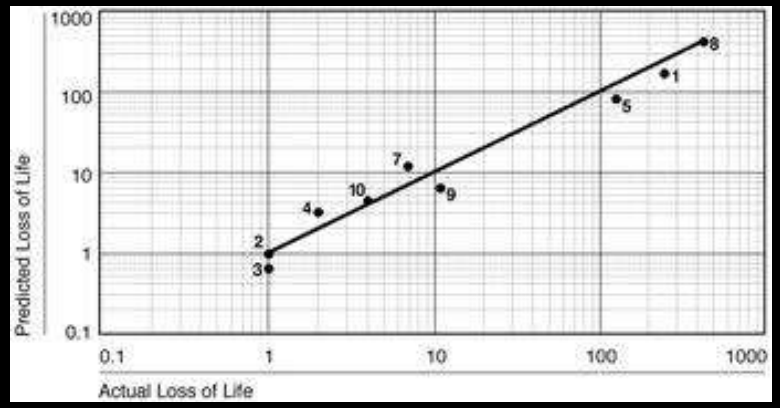
Sasquatch

Paperless office

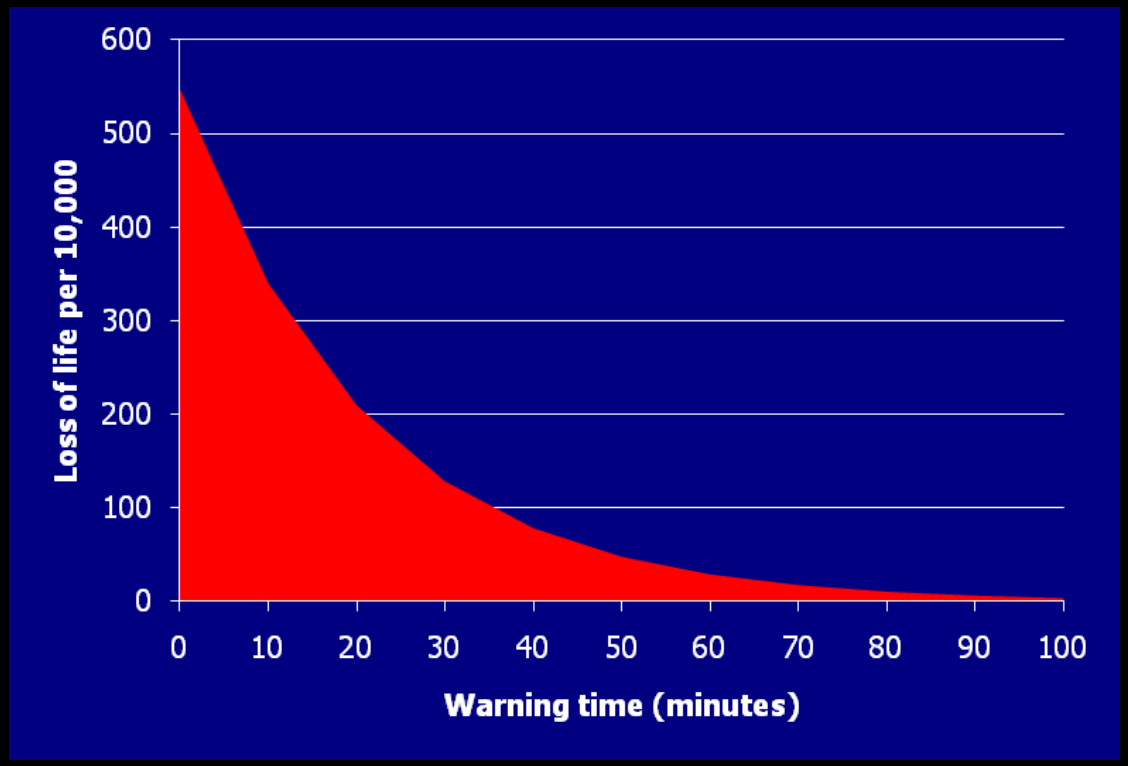
Post-event Response Must Be *Fast* and Accurate

$$\mathrm{LOL} = \frac{P^{*}\mathrm{ef}}{1+13.277\left(P^{*}\mathrm{ef}\right)^{0.44}e^{x}}$$

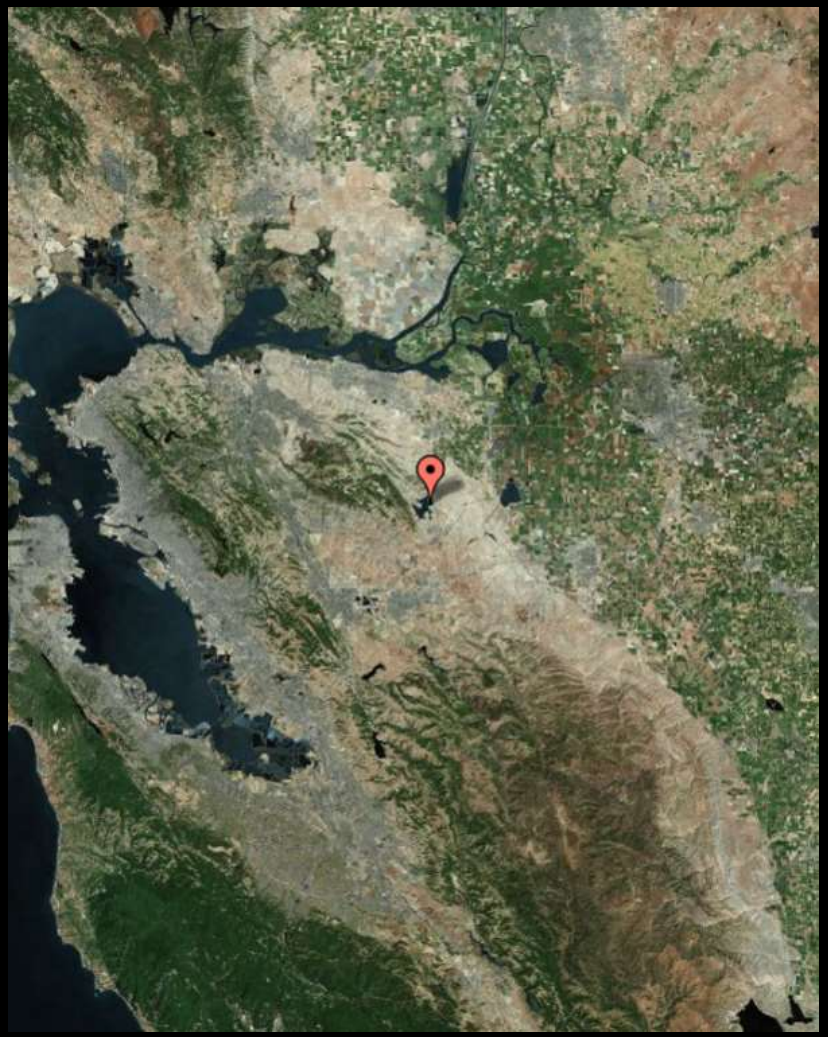
DeKay and McClelland, 1993,
X=2.982 WT – 3.790



Simscience 1999, USBR 1989), from
http://www.waterpowermagazine.com/story.asp?storyCode=2028213



Life Without the National Map Grid

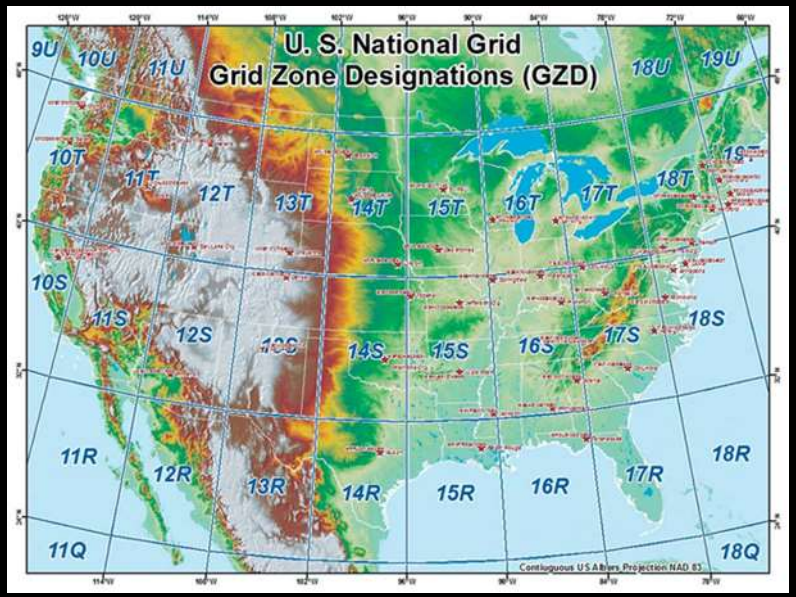


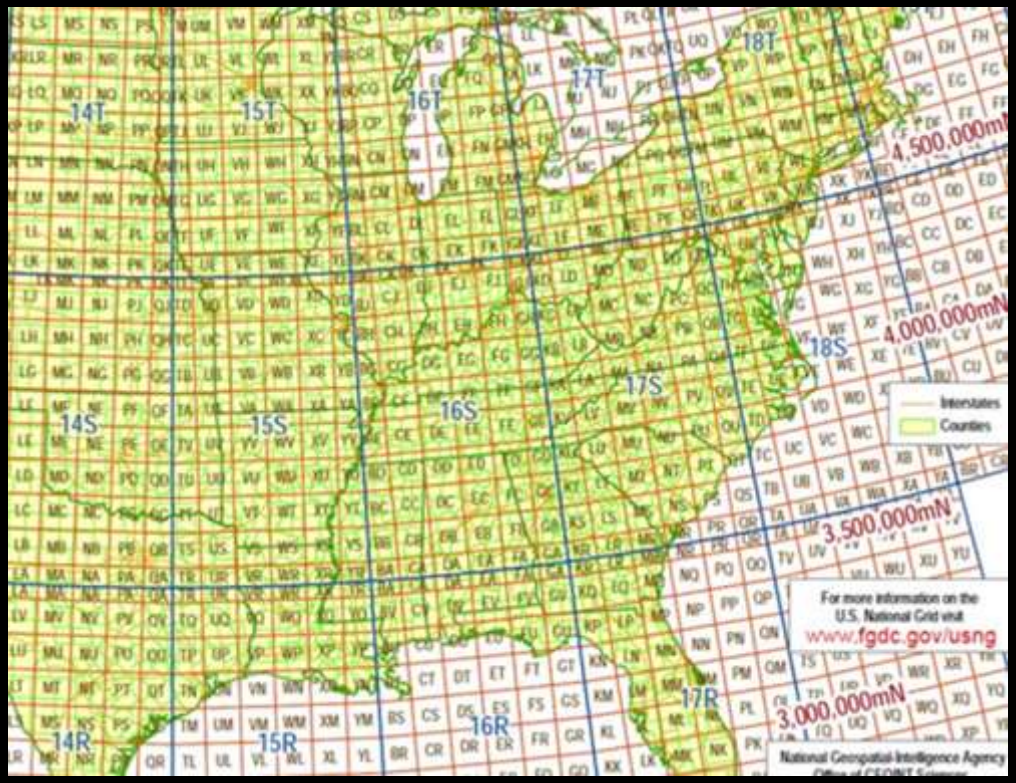
OK. Hold on, where the hell are you?

A seep near the dam. We need some rock on it, fast.

Uh …

National Grid Overview





USNG vs. Lat-long

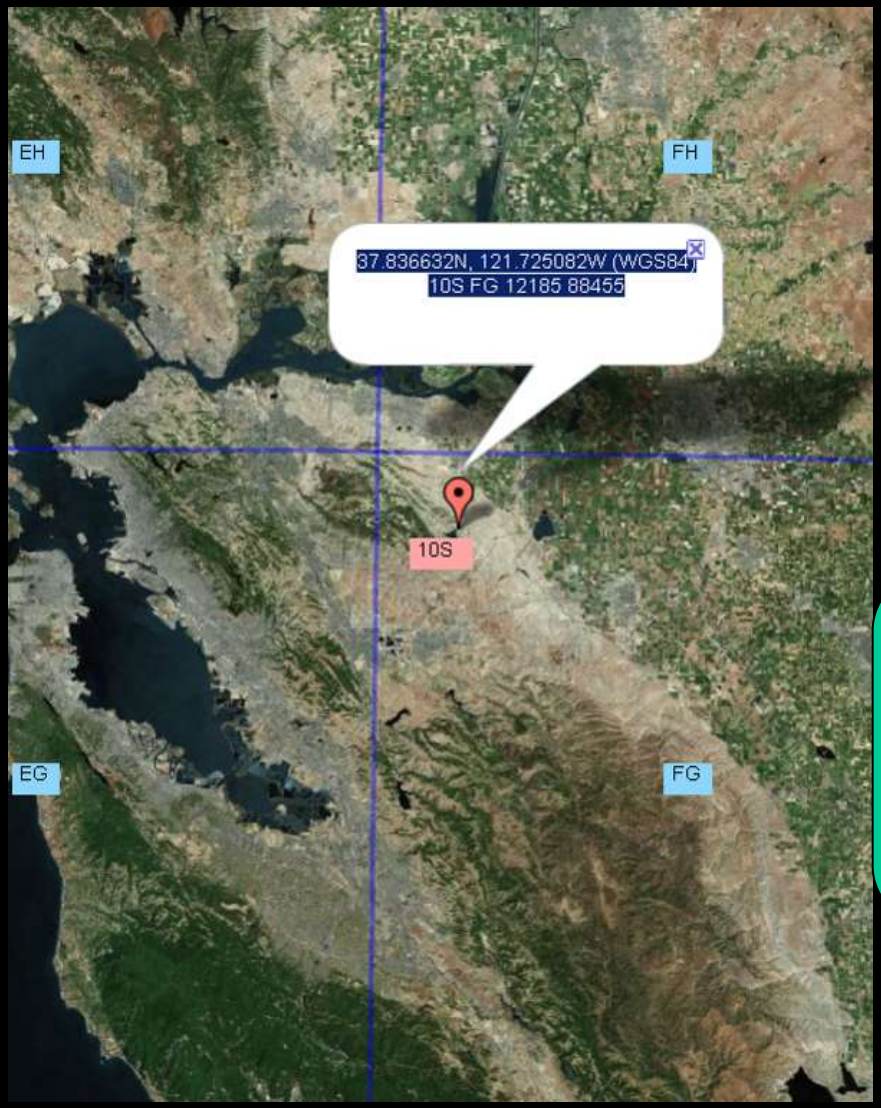
Grid:

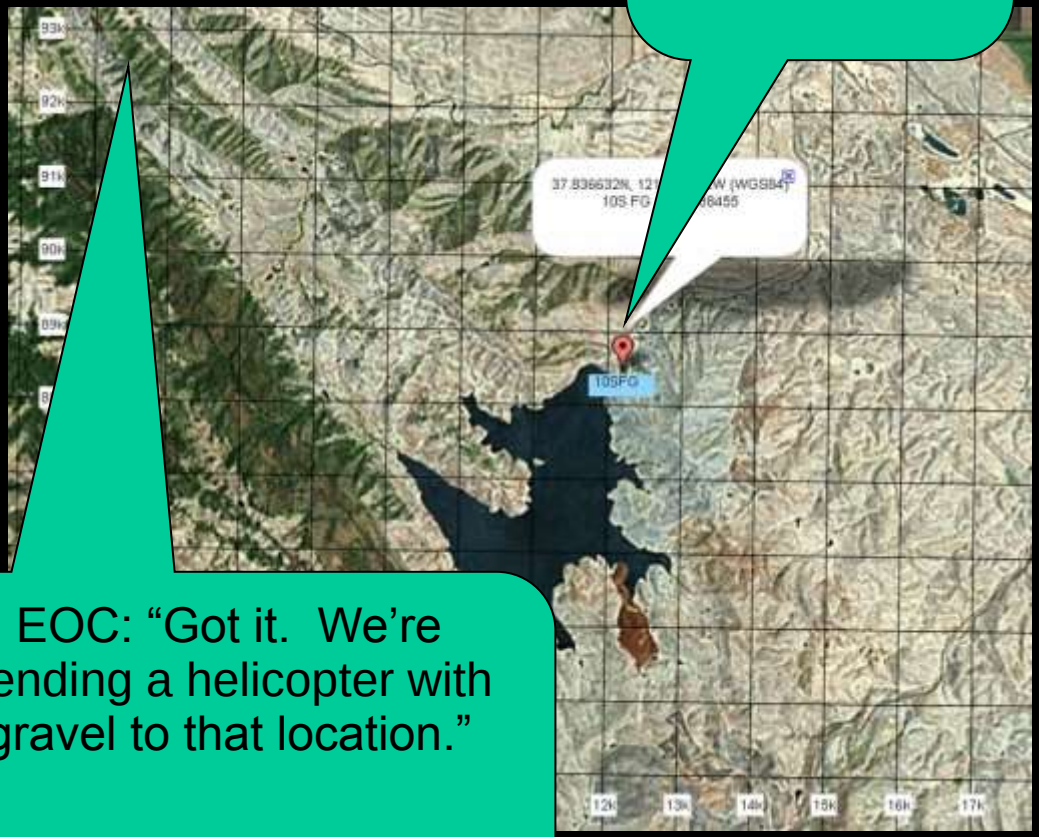
10S EG 60916 85345

Or some jumble of:

37.81347	- 122.30792
37° 48.808' N	122° 18.475' W
37° 48' 48.49" N	122° 18' 28.51" W

Life With the Grid





Field: "The seep is at Grid coordinates 1219 8845"

EOC: "Got it. We're sending a helicopter with gravel to that location."

37.836632N, 121.725082W (WGS84)
10S FG 12185 88455

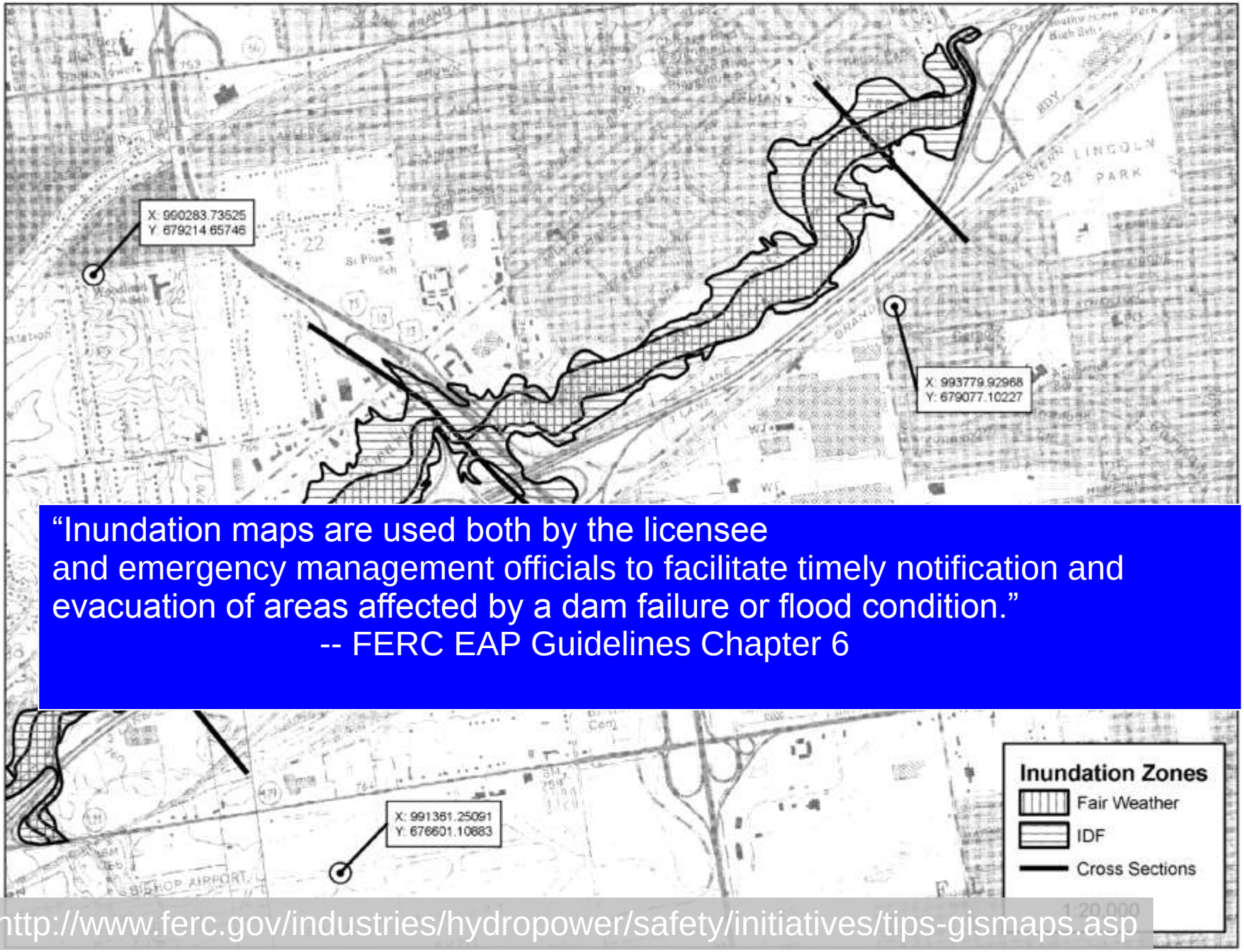
Lots of Agencies Use the National Grid

Sort of

Fed G

A Grow

FERC inundation map exemplar

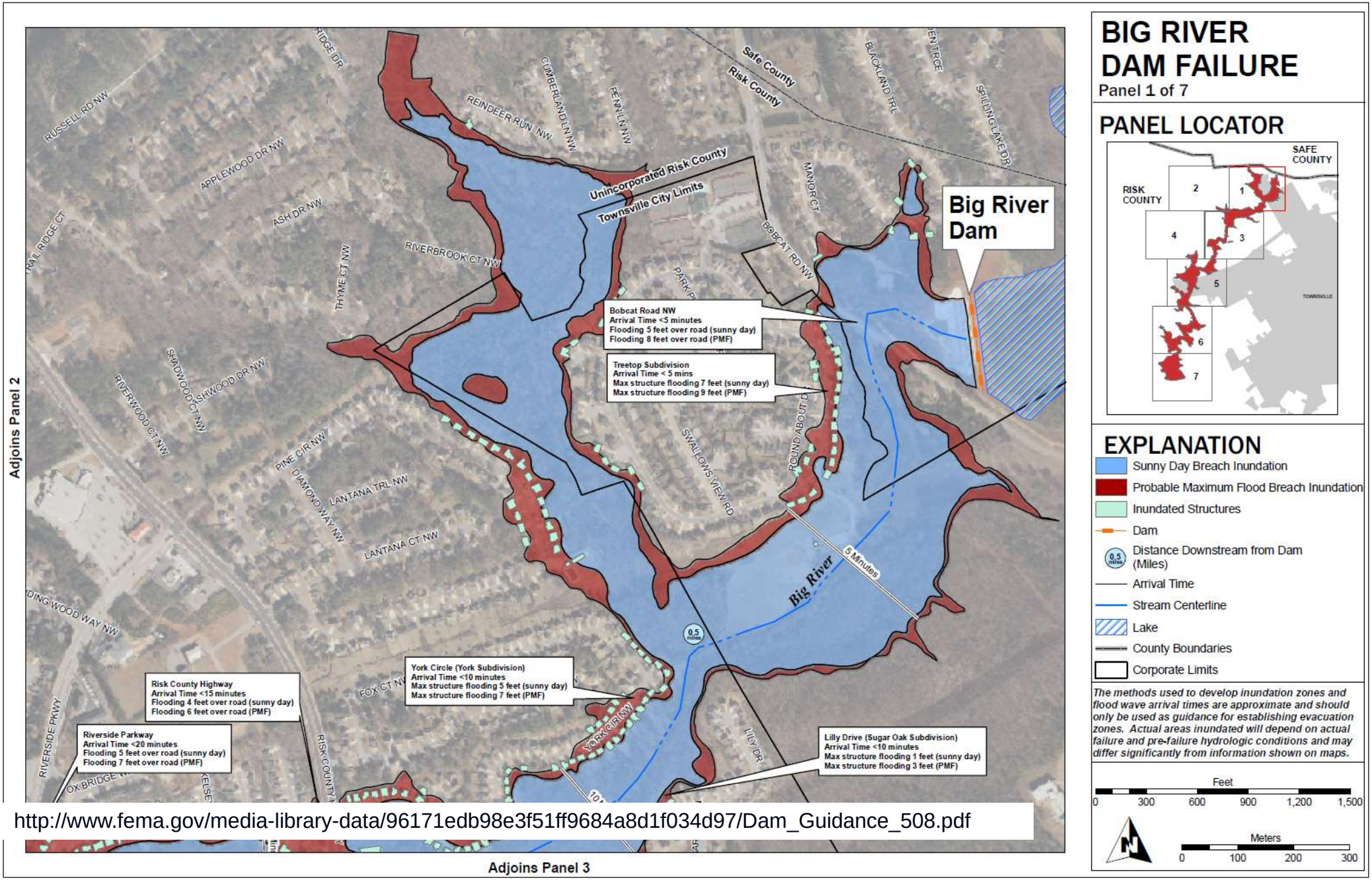


"Inundation maps are used both by the licensee and emergency management officials to facilitate timely notification and evacuation of areas affected by a dam failure or flood condition."

-- FERC EAP Guidelines Chapter 6

http://www.ferc.gov/industries/hydropower/safety/initiatives/tips-gismaps.asp

FEMA inundation map exemplar



http://www.fema.gov/media-library-data/96171edb98e3f51ff9684a8d1f034d97/Dam_Guidance_508.pdf

Written Adoption != Real Adoption

Generalities

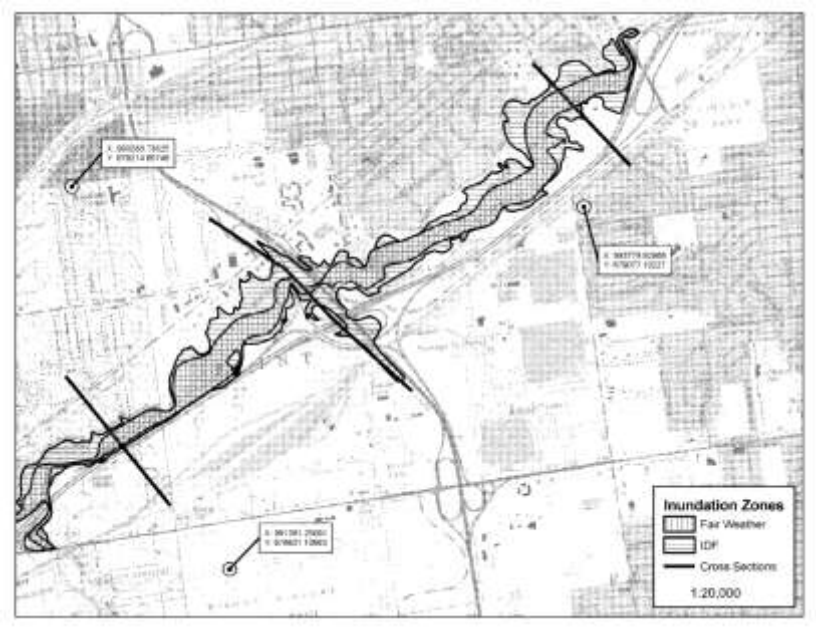
"At FEMA, we're encouraging the adoption of the ***USNG*** for several reasons…"
--Craig Fugate, FEMA Director

"Land SAR responders primarily use ***U.S. National Grid*** ..."
--United States National Search and Rescue Committee

"…FEMA anticipates that use of ***USNG*** will help save lives, reduce costs, and enhance response. [it is] the system used by the National Guard and others..."
-- Mike Buckley, Director FEMA Technical Services Division (abridged)

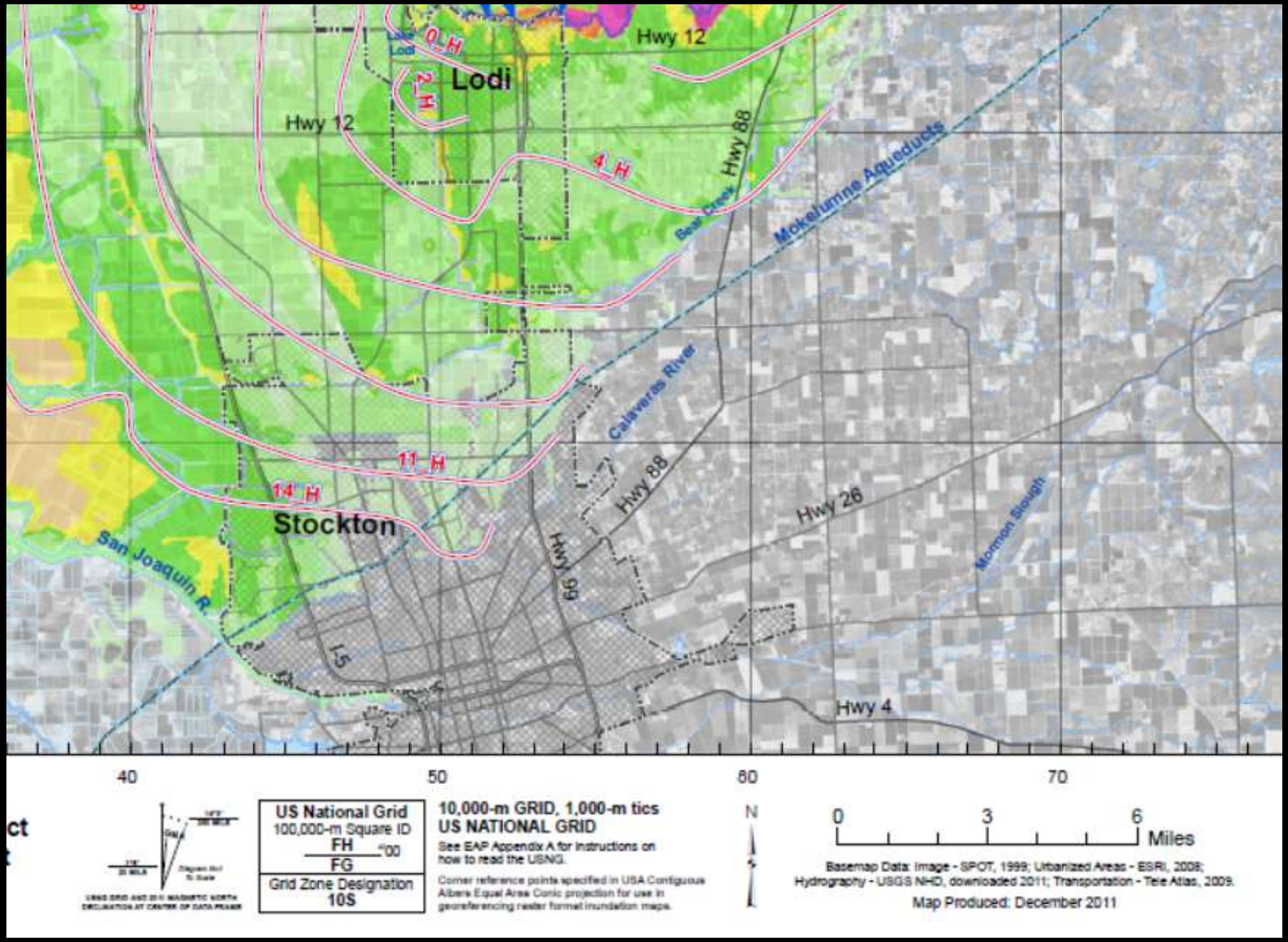
vs.

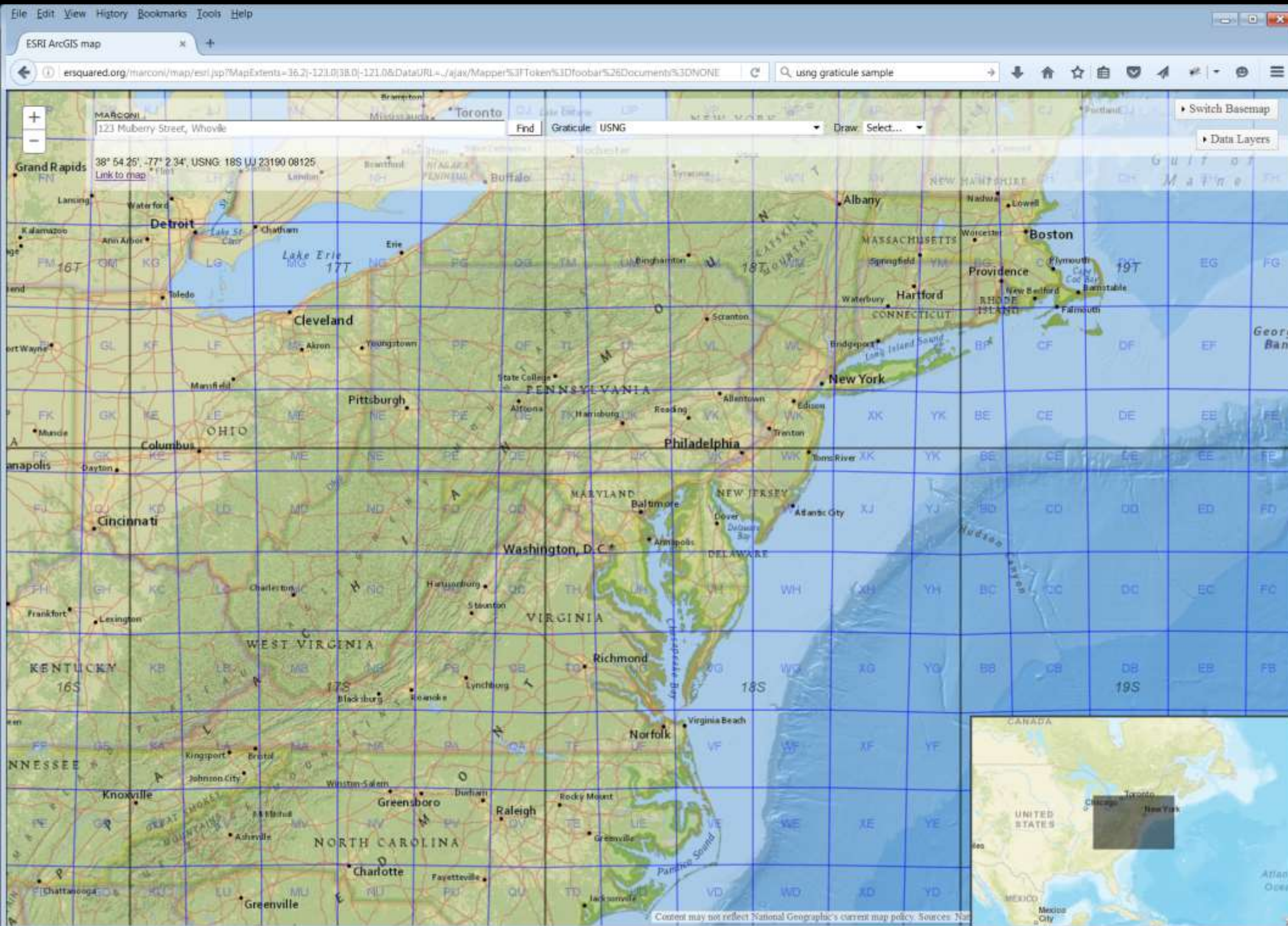
Actual Practices



Actual processes and work products appear to greatly under-utilize US National Grid.

Example Map with USNG

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ESRI ArcGIS map
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usng graticule sample
MARCONI
123 Mulberry Street, Whoville
Find
Graticule USNG
Draw Select...
Switch Basemap
Data Layers
38° 54.25', -77° 2.34', USNG: 18S UJ 23190 08125
Link to map
Grand Rapids
Detroit
Toronto
Buffalo
Albany
Boston
Providence
Hartford
New York
Cleveland
Pittsburgh
Columbus
Cincinnati
Philadelphia
Washington, D.C.
Baltimore
Richmond
Norfolk
Greensboro
Raleigh
Charlotte
Knoxville
Greenville
Lake Erie
OHIO
PENNSYLVANIA
MARYLAND
NEW JERSEY
DELAWARE
VIRGINIA
WEST VIRGINIA
KENTUCKY
NORTH CAROLINA
MASSACHUSETTS
CONNECTICUT
RHODE ISLAND
NEW HAMPSHIRE
Long Island Sound
Chesapeake Bay
Pamlico Sound
Hudson Canyon
Gulf of Maine
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