



NOAA
FISHERIES

Southeast
Region

Emerging Issues Past - Present - Future

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National EFH Summit
Annapolis, MD

LNG Facilities Existing and Proposed



April 2004

Existing Facilities with Approved Expansions

- A. Everett, MA: 1.035 Bcf/d (Tractebel)
- B. Cove Point, MD: 1.0 Bcf/d (Dominion)
- C. Elba Island, GA: 1.2 Bcf/d (El Paso)
- D. Lake Charles, LA: 1.2 Bcf/d (Southern Union)

Approved Facilities

- 1. Hackberry, LA: 1.5 Bcf/d, (Sempra Energy)
- 2. Port Pelican: 1.6 Bcf/d, (Chevron/Texasco)
- 3. Bahamas: 0.84 Bcf/d, (AES Ocean Express)*
- 4. Gulf of Mexico: 0.5 Bcf/d, (El Paso Global)

Proposed Facilities – FERC

- 5. Bahamas: 0.83 Bcf/d, (Calypso Tractebel)
- 6. Freeport, TX: 1.5 Bcf/d, (Cheniere / Freeport LNG Dev.)
- 7. Fall River, MA: 0.8 Bcf/d, (Weaver's Cove Energy)
- 8. Long Beach, CA: 0.7 Bcf/d, (SES/Mitsubishi)
- 9. Corpus Christi, TX: 2.6 Bcf/d, (Cheniere LNG Partners)
- 10. Sabine, LA: 2.6 Bcf/d (Cheniere LNG)
- 11. Corpus Christi, TX: 1.0 Bcf/d (Vista Del Sol/ExxonMobil)
- 12. Sabine, TX: 1.0 Bcf/d (Golden Pass/ExxonMobil)
- 13. Logan Township, NJ: 1.2 Bcf/d (Crown Landing LNG – BP)

Proposed Facilities – Coast Guard

- 14. California Offshore: 1.5 Bcf/d, (Cabrillo Port – BHP Billiton)
- 15. Louisiana Offshore: 1.0 Bcf/d (Gulf Landing – Shell)
- 16. So. California Offshore: 0.5 Bcf/d, (Crystal Energy)

Planned Facilities and Expansions

- 17. Brownsville, TX: n/a, (Cheniere LNG Partners)
- 18. Humboldt Bay, CA: 0.5 Bcf/d, (Calpine)
- 19. Mobile Bay, AL: 1.0 Bcf/d, (ExxonMobil)
- 20. Somerset, MA: 0.65 Bcf/d (Somerset LNG)
- 21. Louisiana Offshore: 1.0 Bcf/d (McMoran Exp.)
- 22. Belmar, NJ Offshore: n/a (El Paso Global)
- 23. Bahamas: 0.5 Bcf/d, (Seafarer - El Paso/FPL)
- 24. Altamira, Tamaulipas: 1.12 Bcf/d, (Shell)
- 25. Baja California, MX: 1.0 Bcf/d, (Sempra & Shell)
- 26. Baja California: 0.6 Bcf/d (Conoco-Phillips)
- 27. Baja California - Offshore: 1.4 Bcf/d, (Chevron/Texasco)
- 28. Baja California: 0.85 Bcf/d, (Marathon)
- 29. California - Offshore: 0.5 Bcf/d, (Chevron/Texasco)
- 30. St. John, NB: 0.75 Bcf/d, (Irving Oil & Chevron Canada)
- 31. Point Tupper, NS: 0.75 Bcf/d (Access Northeast Energy)
- 32. Harpswell, ME: 0.5 Bcf/d (Fairwinds LNG – CP & TCPL)
- 33. St. Lawrence, QC: n/a (TCPL and/or GazMet)
- 34. Lázaro Cárdenas, MX: 0.5 Bcf/d (Tractebel)
- 35. Gulf of Mexico: 1.0 Bcf/d (ExxonMobil)
- 36. Providence, RI: 0.5 Bcf/d (Keystone & BG LNG)
- 37. Mobile Bay, AL: 1.0 Bcf/d (Cheniere LNG Partners)
- 38. Lake Charles, LA: 0.6 Bcf/d (Southern Union)
- 39. Cherry Point, WA: 0.5 Bcf/d (Cherry Point Energy LLC)
- 40. Cove Point, MD: 0.8 Bcf/d (Dominion)

*US pipeline approved; LNG terminal pending in Bahamas

LNG Open Rack Vaporization

100-250 million gallons per day

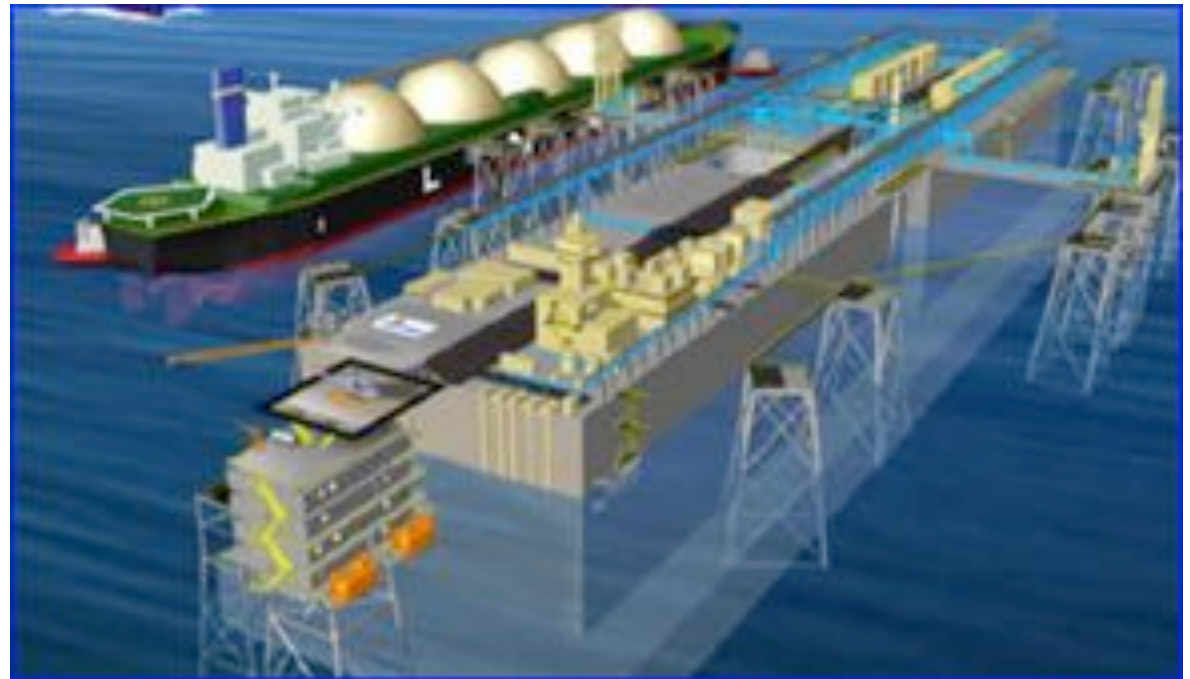
- discharge 15-30 degrees colder than ambient
- entrainment - impingement - anit-fouling chemicals

“Don’t comment on NEPA”

“We’re Busy”

“We can’t comment in that
timeframe!”

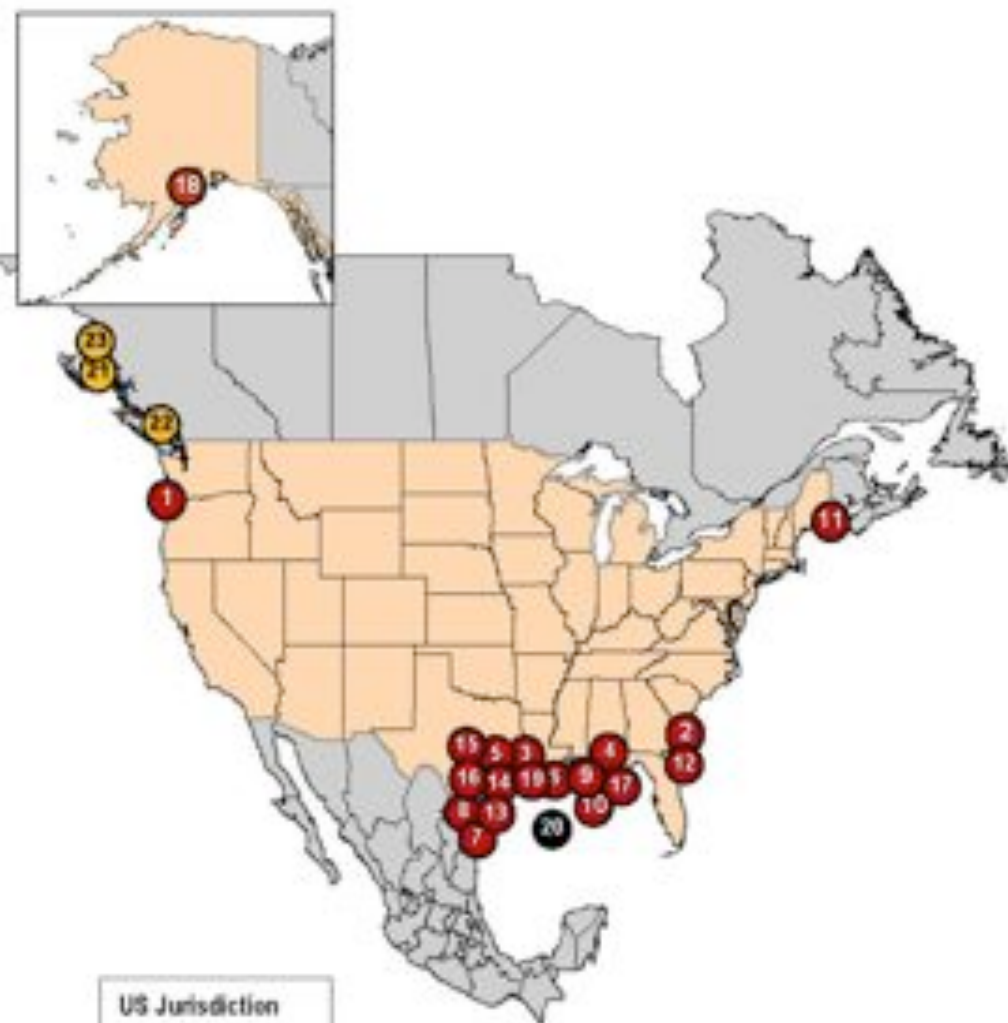
“It’s a Habitat Issue”



LNG Open Rack Vaporization

- Mortality estimate:
 - 5 Billion fish eggs & larvae per facility
- “[t]he negative impacts to fishery species and living marine resources in the Gulf from a single [open-loop] facility are potentially severe, and cumulative impacts from multiple facilities must be considered a threat to fishery resources.”

North American LNG Export Terminals Proposed



US Jurisdiction

- FERC
- MARAD/USCG

As of May 6, 2016

PROPOSED TO FERC

Pending Applications:

1. Astoria, OR: 1.25 Bcfd (Oregon LNG) (CP09-6)
2. Etba Island, GA: 0.35 Bcfd (Southern LNG Company) (CP14-103)
3. Sabine Pass, TX: 2.1 Bcfd (ExxonMobil - Golden Pass) (CP14-517)
4. Pascagoula, MS: 1.5 Bcfd (Gulf LNG Liquefaction) (CP15-521)
5. Freeport, TX: 0.34 Bcfd (Freeport LNG Dev) (CP15-518)
6. Cameron Parish, LA: 1.41 Bcfd (Venture Global Calcasieu Pass) (CP15-550)
7. Brownsville, TX: 0.55 Bcfd (Texas LNG Brownsville) (CP16-116)
8. Brownsville, TX: 3.6 Bcfd (Rio Grande LNG - NextDecade) (CP16-454)

Projects in Pre-filing:

9. Plaquemines Parish, LA: 1.07 Bcfd (CE FLNG) (PF13-11)
10. Plaquemines Parish, LA: 0.30 Bcfd (Louisiana LNG) (PF14-17)
11. Robbinston, ME: 0.45 Bcfd (Kestrel Energy - Downeast LNG) (PF14-19)
12. Jacksonville, FL: 0.075 Bcfd (Eagle LNG Partners) (PF15-7)
13. Brownsville, TX: 0.94 Bcfd (Annova LNG Brownsville) (PF15-15)
14. Port Arthur, TX: 1.4 Bcfd (Port Arthur LNG) (PF15-18)
15. Freeport, TX: 0.72 Bcfd (Freeport LNG Dev) (PF15-25)
16. Corpus Christi, TX: 1.4 Bcfd (Cheniere - Corpus Christi LNG) (PF15-26)
17. Plaquemines Parish, LA: 2.80 Bcfd (Venture Global LNG) (PF15-27)
18. Nikiski, AK: 2.55 Bcfd (ExxonMobil, ConocoPhillips, BP, TransCanada and Alaska Gasline) (PF14-21)
19. Cameron Parish, LA: 1.84 Bcfd (G2 LNG) (PF16-2)

PROPOSED TO U.S.-MARAD/USCG

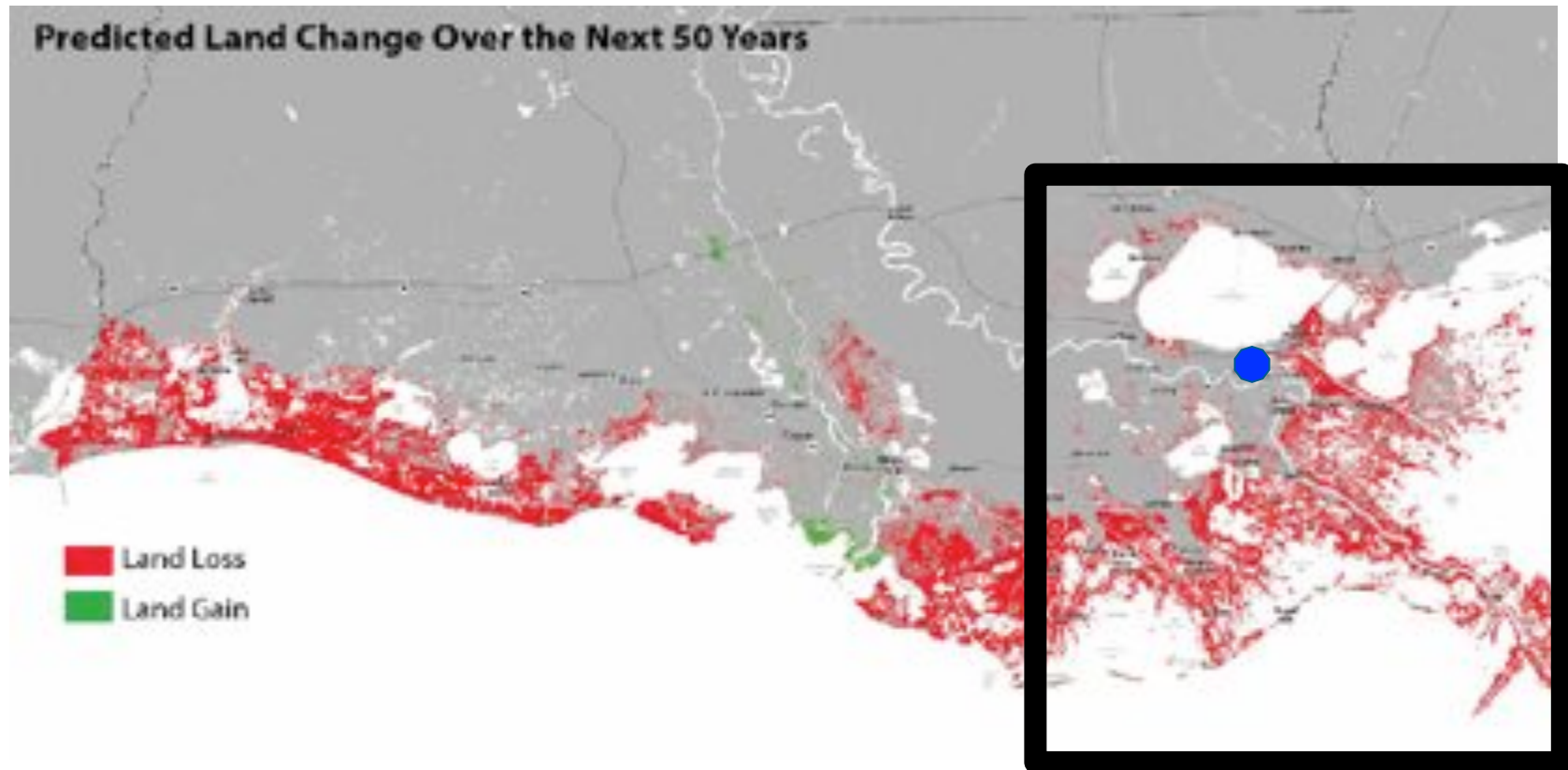
20. Gulf of Mexico: 1.8 Bcfd (Delfin LNG)

PROPOSED CANADIAN SITES

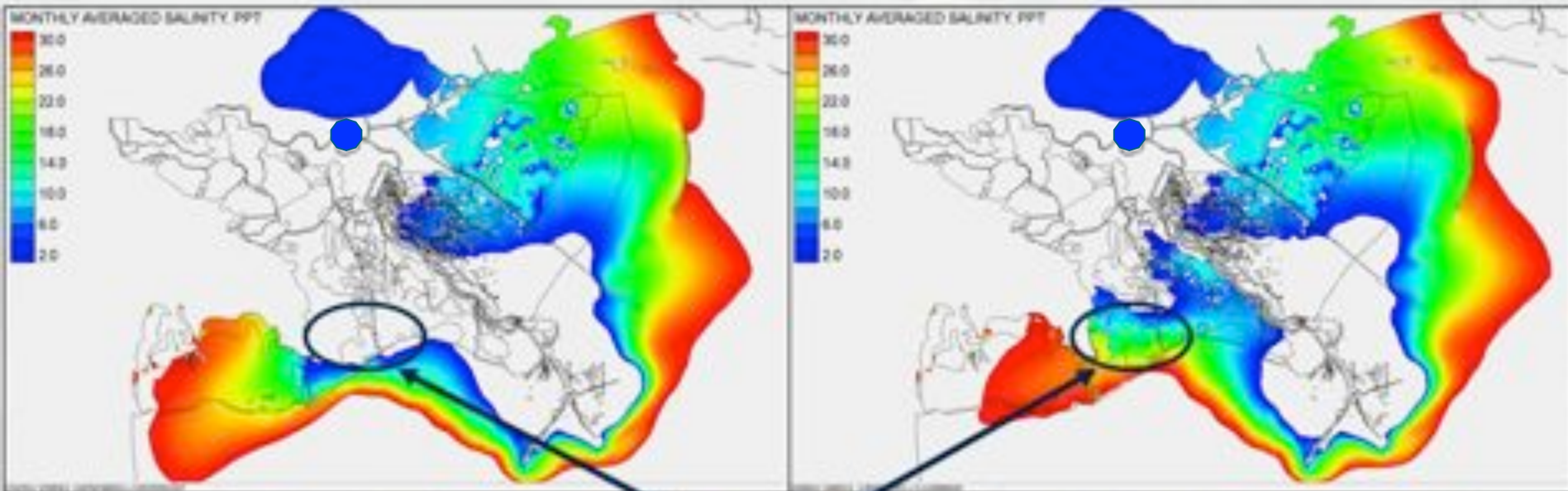
21. Kitimat, BC: 1.28 Bcfd (Apache Canada Ltd)
22. Douglas Island, BC: 0.23 Bcfd (BC LNG Export Cooperative)
23. Prince Rupert Island, BC: 2.74 Bcfd (Pacific Northwest LNG)

Sediment Diversions

- Mississippi River Levees
 - 1800 sq miles lost past 100 years



Month-Averaged Salinity: June



Small and Large Brown Shrimp: Optimal 10 ppt to 25 ppt

Run5: Mid Barataria, 250K maximum discharge



Sediment Diversions

- Established Regional interdisciplinary planning team
- Population effects of converting EFH for brown/white shrimp to freshwater habitat are unknown
- SERO Strategic Plan
 - Cross division / interdisciplinary teams



Orange Cup Coral (*Tubastraea coccinea*)



- Native to Indo-Pacific
- Puerto Rico/Curacao in 1943
- In the Gulf, it seems to have found ideal habitat in the form of oil and gas production platforms, where it is the dominant coral species. Hundreds of thousands of colonies may exist on a single platform (Sammarco et. al. 2010).

Halophila stipulacea



- Native to Indian Ocean
- Mediterranean in late 1800's through Suez Canal
- Eastern Caribbean in 2002
- May displace *Syringodium filiforme*
- Photo: <http://reservenaturelle-saint-martin.com/en>

What do we do?

- EFH Designations
 - Coral
 - SAV / Seagrass
- Protect / not protect
- Do we accept eradication as mitigation?
 - May do more harm than good



