

# The Rescuers: Saving Marine Life from Oil Spills

**Oiled Wildlife Care Network  
Wildlife Health Center  
UC Davis**

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Dr. Michael Ziccardi



Oiled Wildlife Care Network  
UC Davis Wildlife Health Center



**UC DAVIS**  
VETERINARY MEDICINE  
Wildlife Health Center

# Why Treat Oiled Wildlife?



# The Oiled Wildlife Argument

## ◆ Against

- Many animals die
- Focus on individual animals
- \$\$\$, can be used in better ways
- “Simply a PR exercise”



# The Oiled Wildlife Argument

## ◆ For

- Public demands, humane issues
- May have population impact
- 1-5% of total cost and \$ used will not go to other areas
- Legal Mandate



# National Awakening: EVOS

- ◆ 11 million gal in PWS March 1989
- ◆ Estimated impacts:
  - ◆ 250,000 seabirds
  - ◆ 2,800 sea otters
  - ◆ 300 harbor seals
  - ◆ 22 killer whales



# Exxon Valdez



- ◆ Sea Otters – 1,000 Dead – 380 Alive

# Exxon Valdez



- ◆ Birds – 35,000 Dead – 1,640 Alive

# The Beginning

- ◆ Ted Lempert (D-San Carlos), Barry Keene (D-Napa), and Andrea Seastrand (R-Orange County)
- ◆ CA no more prepared than AK - wanted assurance that CA would be protected
- ◆ Opposed by industry, who did not want over regulation

# OSPR



- ◆ February 7, 1990: American Trader spilled 416,000 gallons of crude oil off Huntington Beach
- ◆ Lempert-Keene-Seastrand bill was passed in September of 1990, which created the office of Oil Spill Prevention and Response (OSPR)

# OSPR

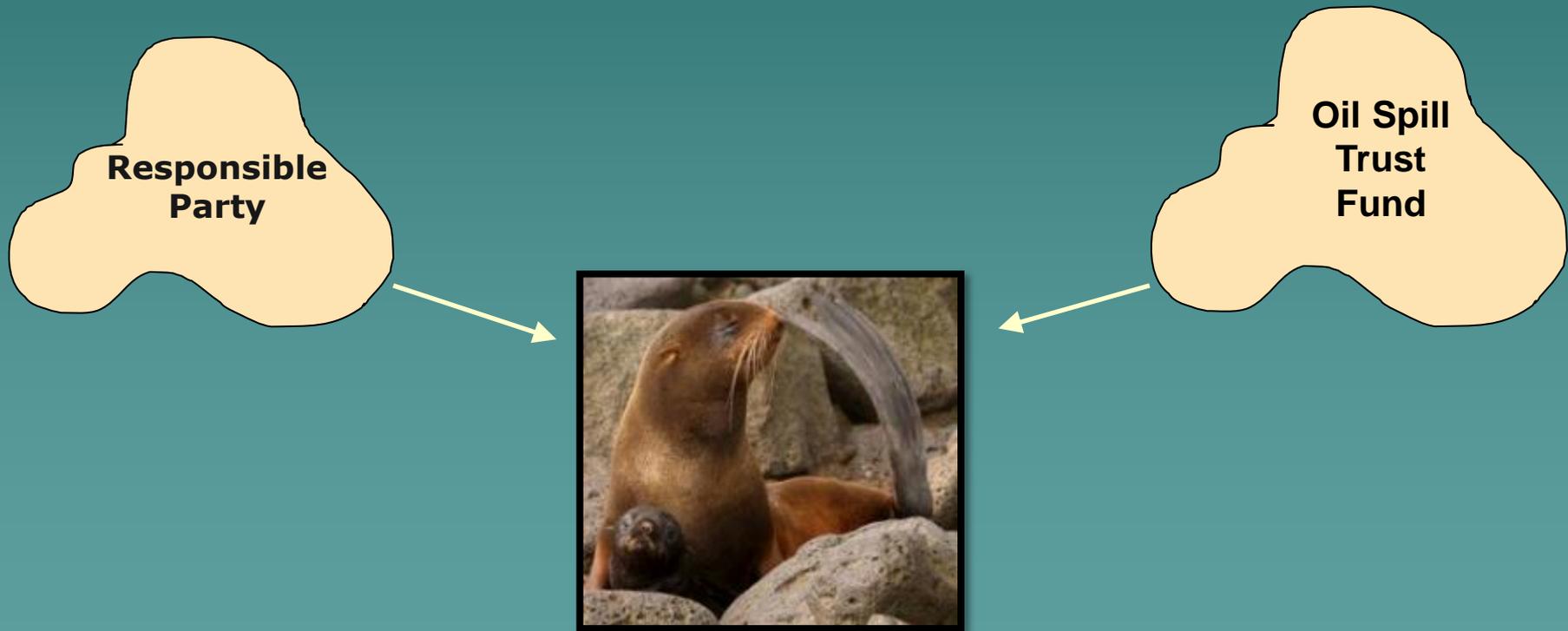
- ◆ Directs oil spill prevention, response, and clean-up
- ◆ Wildlife aspects
  - Develop rehabilitation stations
  - Ensure preparedness
  - Provide treatment to oiled wildlife



**California is unique in organized, prepared oiled wildlife care**

# Oiled Wildlife Care Network

- ◆ Created in 1994
  - “Wildlife response arm” of CDGF-OSPR
  - 1994-1997 OSPR; 1997 on WHC at UC Davis



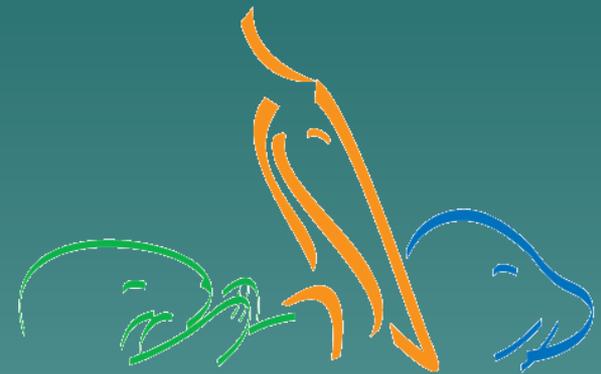
# OWCN

## ◆ Mission

– Best achievable  
(recovery and) care  
of oiled wildlife

– Four “R’s”

- ◆ Readiness
- ◆ Research
- ◆ Reaching Out
- ◆ Response



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Oiled Wildlife Care Network

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UC Davis Wildlife Health Center

# Readiness: Partners

- ◆ Participants
  - 29 orgs represented
  - Rehab orgs, universities, NGOs
- ◆ Agreements
  - Them: Provide rapid cooperative response
  - Us: Equip, supply & train



# Readiness: Facilities

## ◆ Types

- Primary care: 12 facilities
- Stabilization: 11 facilities

## ◆ Multi-Use

- Reduces spill startup time
- Cost-effective maintenance
- Non-spill use
  - ◆ Rehabilitation
  - ◆ Education
  - ◆ Research



# Readiness: Training

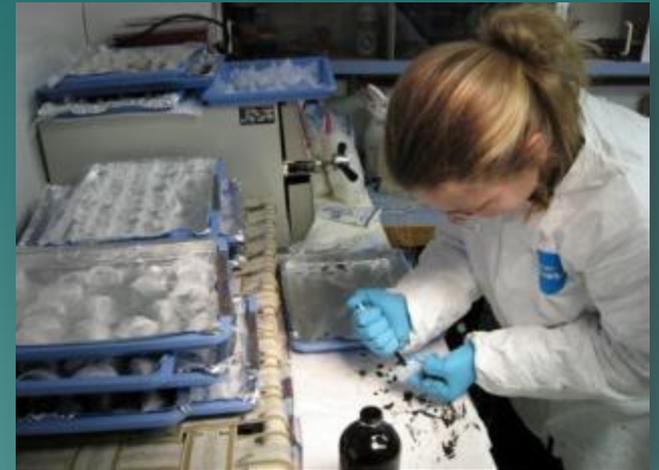
- ◆ Convergent Volunteers
  - Basic info/safety
- ◆ Pre-Trained Volunteers
  - Basic
    - ◆ “Webinar”, animal care overviews
  - Conference/Labs
    - ◆ More advanced techniques

Volunteers Are Important!!!



# Research: Grants

- ◆ Purpose
  - Better understand effects
  - How best to care for wildlife
  - Post-release survival
- ◆ \$250,000
- ◆ Success
  - Over 140 projects funded since 1996
  - Three post-release projects since 1997



# Research: In house

- ◆ Soft sided pens
- ◆ Nutrition & fluids
- ◆ Effects of being housed in fresh water
- ◆ Infrared cameras to monitor waterproofing
- ◆ Testing satellite transmitters



# Reaching Out

- ◆ K – 12 Education
- ◆ Collegiate Education
- ◆ Public Outreach
  - Website, newsletters, documents
  - Presentations, drills
- ◆ National/International Assistance
  - Response planning, spill assistance, facility development





# Response

>75 spills in CA and almost 8,000 oiled birds and mammal

Cosco Busan 2007

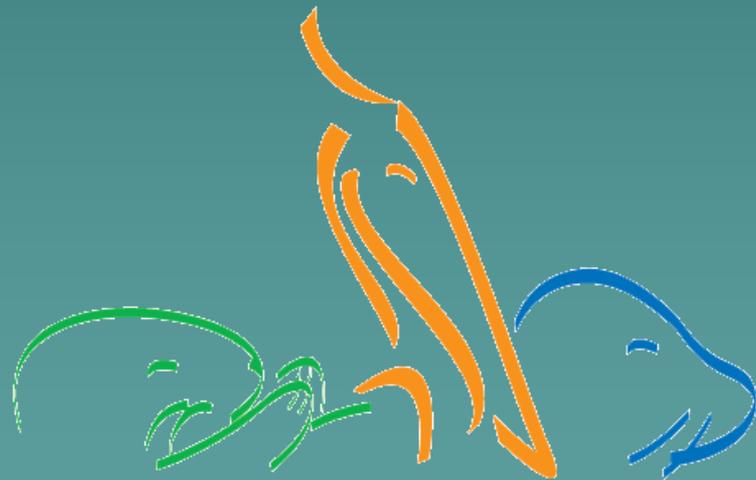
Dubai Star 2009

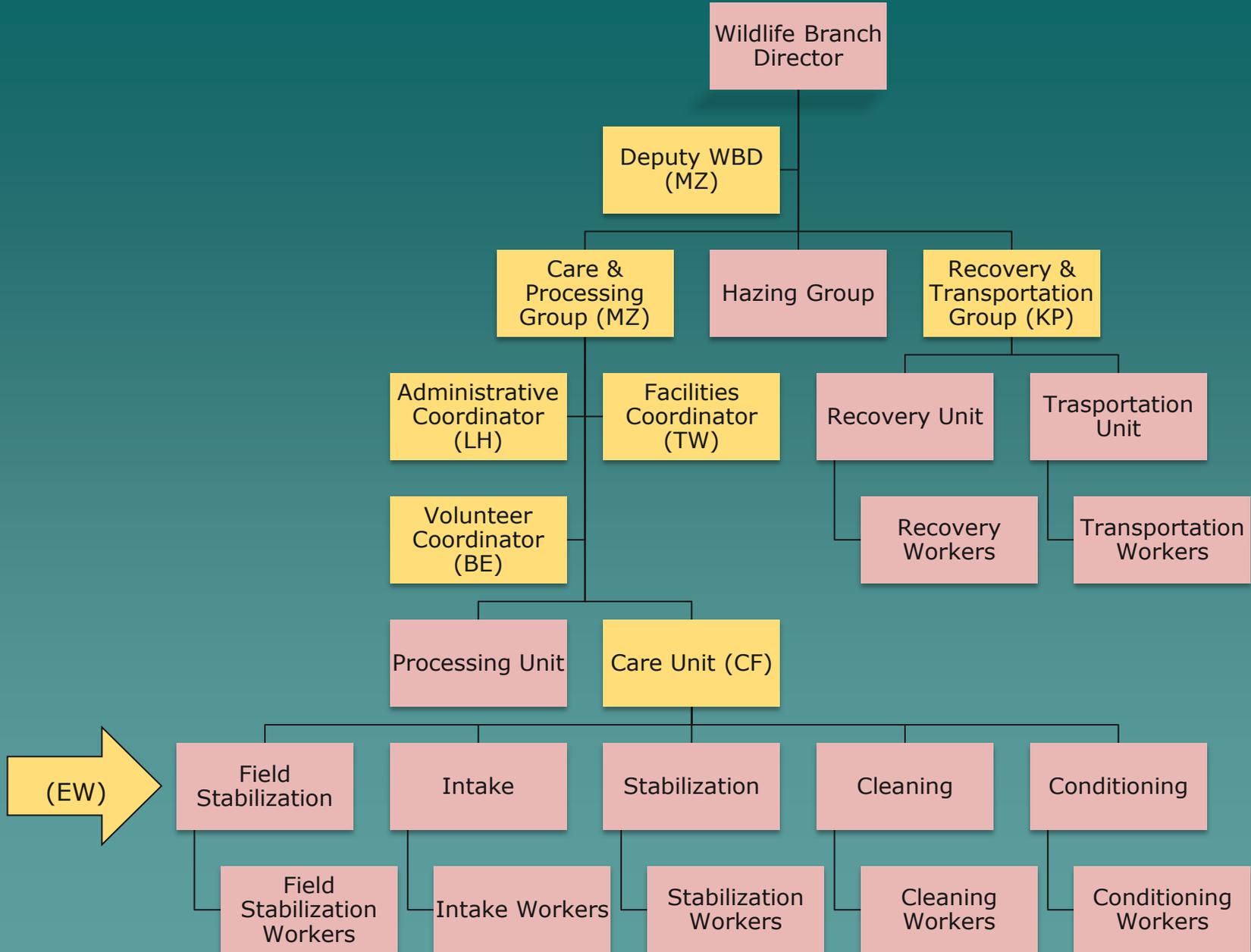
Deepwater Horizon 2010



# Response

- ◆ 7 Staff member
- ◆ Additional staff through member organizations
- ◆ Volunteers





# Response

- ◆ Dr. Mike Ziccardi
  - Director
  - Deputy Wildlife Branch Director
  - Care & Processing Supervisor
  - Clinical Veterinarian



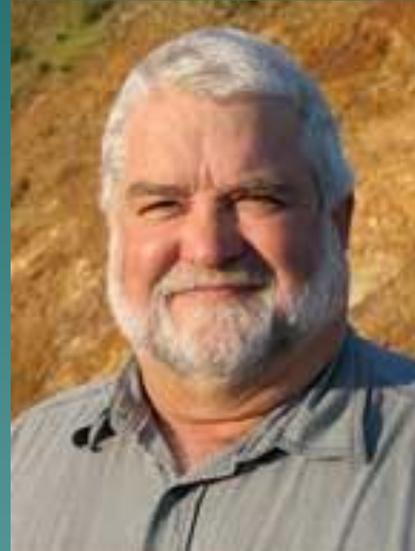
# Response

- ◆ Lavonne Hull
  - Administrative Coordinator
  - Supplies
  - Logistics Support
  - Billing
  - Compliance



# Response

- ◆ Tim Williamson
  - Facility Coordinator
  - Set up of facilities
  - Operations



# Response

- ◆ Becky Elias
  - Volunteer Coordinator
  - Train and manage volunteers
  - Ensure that the facility is staffed



# Response

**Recovery & Transport**



**Processing & Intake**



**Stabilization**



**Release**



**Conditioning**



**Cleaning**



# Response

- ◆ Kyra Mills-Parker
  - Recovery & Transportation Specialist
  - Overseeing field operations



# Response

- ◆ Dr. Christine Fiorello
  - Response Vet
  - Leading the Care Unit
    - ◆ Intake
    - ◆ Stabilization
    - ◆ Cleaning
    - ◆ Conditioning



# Response

- ◆ Emily Whitmer
  - Wildlife Care Specialist
  - Coordinating one of the care groups
  - Rehab support



**Dr. Christine Fiorello**

**EFFECTS OF OIL ON WILDLIFE**

# Effects of Oil on Wildlife



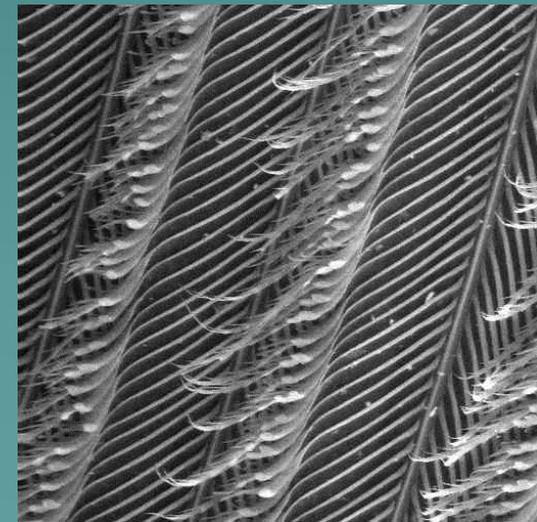
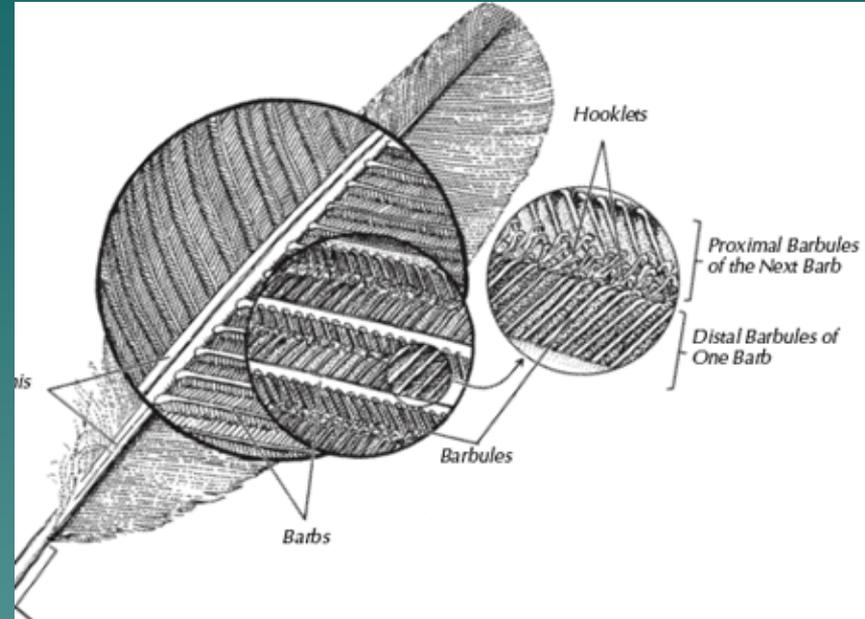
# Direct effects of oil

- ◆ **Physical disruption of feather structure**
  - Hypothermia
  - Dehydration
  - Loss of buoyancy
- ◆ **Mucosal, skin, & eye**
  - Pain, discomfort
  - Systemic absorption of oil



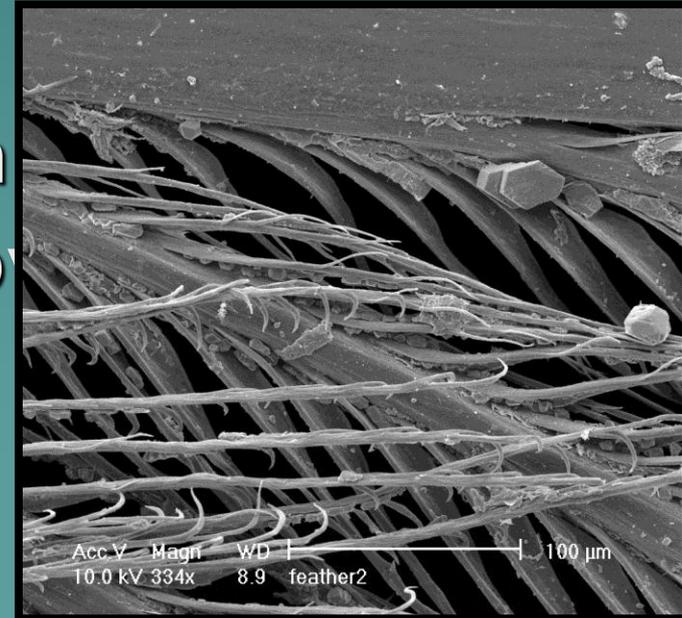
# Feathers

- ◆ Waterproofing is structural
- ◆ Barbules interlink at microscopic level
- ◆ Not dependent on preen gland secretions



# Feather damage

- ◆ Any substance that interferes with microscopic structure impairs waterproofing
- ◆ Barbules cannot interlock
  - Cannot trap air
  - Bird becomes wet to skin
  - Hypothermia, loss of buoyancy



# Direct effects of oil

- ◆ **RBC damage**

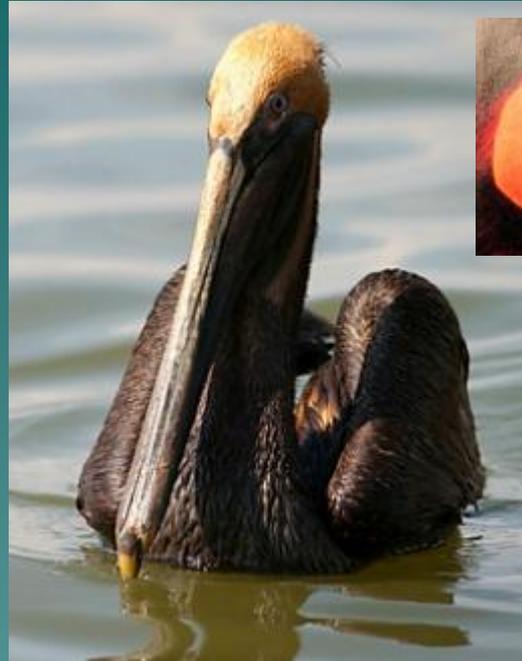
- Anemia
- Weakness

- ◆ **Lung injury**

- Pneumonia

- ◆ **Ingestion → stomach/intestinal ulcers**

- Problems digesting nutrients
- Emaciation



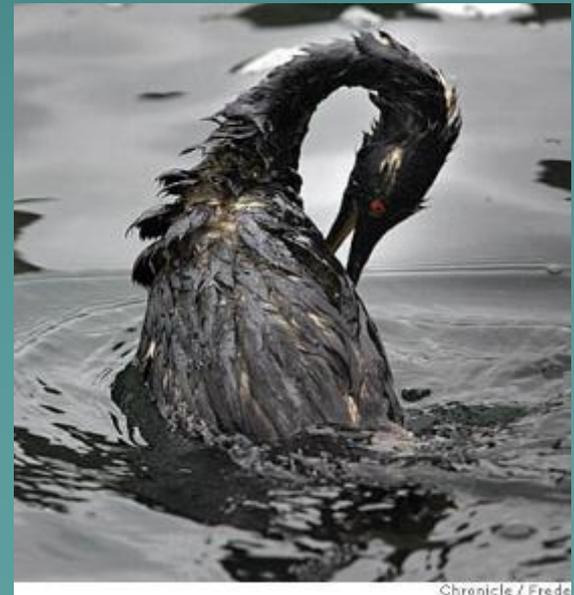
# Secondary effects

- ◆ Malnutrition
- ◆ Immunosuppression
  - Fungal infections
- ◆ Keel lesions, joint swelling
- ◆ Foot problems



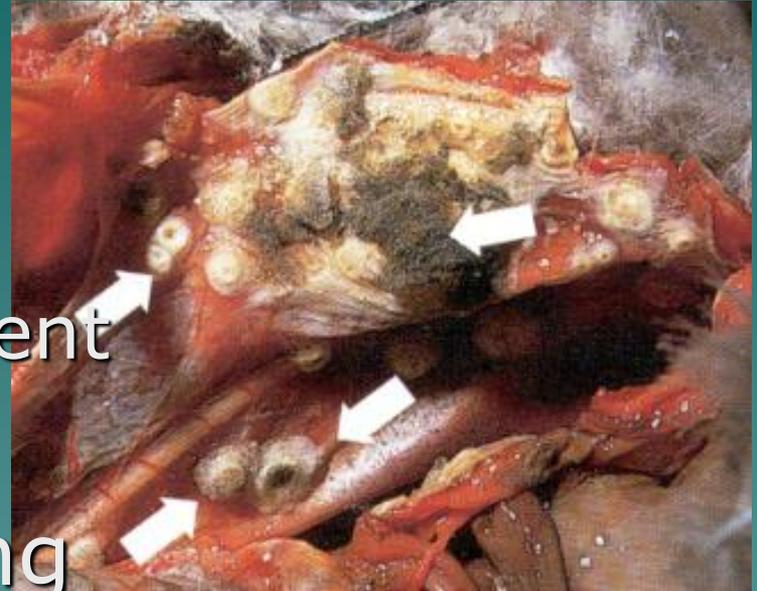
# Malnutrition

- ◆ Contributing factors:
  - Inability to find food
  - Higher energy needs
  - Poor digestion
  - Damage to intestines
  - Feather oiling
    - ◆ Preening increases oil ingestion



# Fungal infections

- ◆ Exacerbated by
  - Poor ventilation
  - Warm, humid environment
  - Stress!
- ◆ Once established, curing the infection is extremely difficult



# Ultimate result

- ◆ Debilitation and death



**Kyra Mills-Parker**

DEEPWATER HORIZON OIL SPILL

# DEEPWATER HORIZON OIL SPILL



20 April 2010





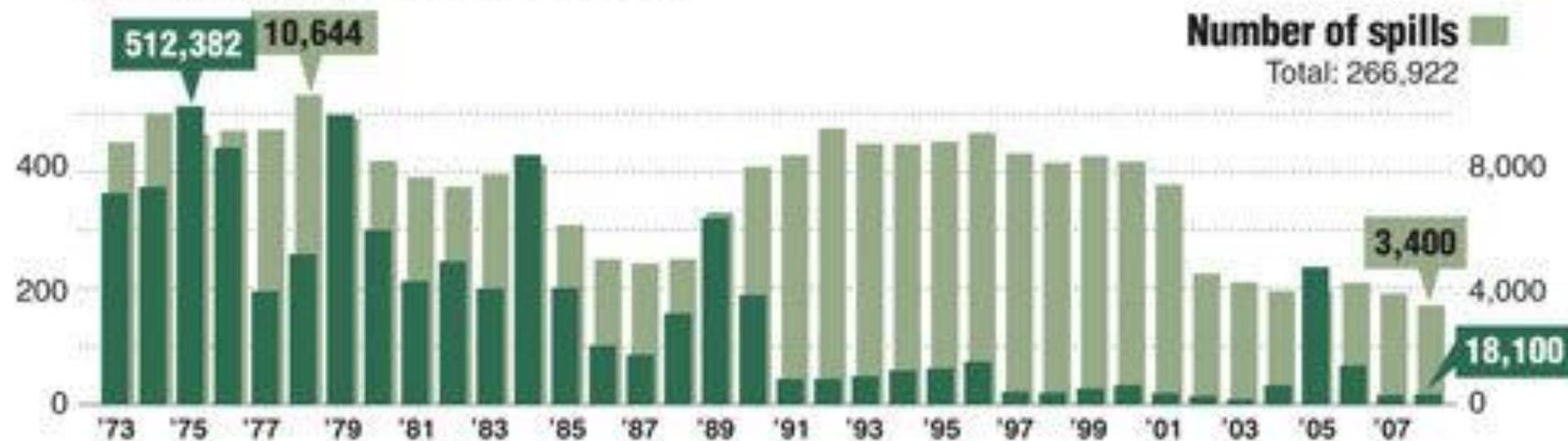


# A look at U.S. oil spills

Though the number and size of oil spills has dropped in recent years, the BP spill equals more than three-quarters of the total spilled nationally, 1973-2008.

## Amount spilled

In thousand of barrels (One barrel equals 42 gallons)

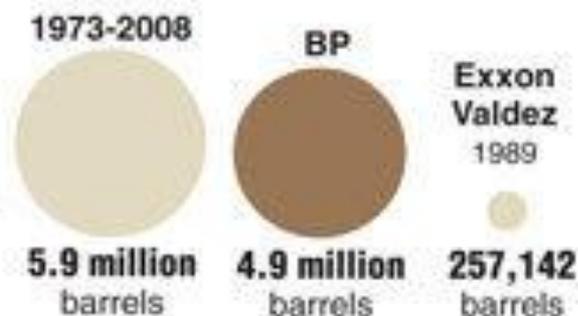


Source: U.S. Coast Guard, BP  
Graphic: Judy Treible

NOTE: Spill size ranges from less than a barrel to 24,000 barrels or more; BP spill estimate is at high end of range

## Compared to big spills

The BP spill equals about 83 percent of 36 years of spills, Exxon Valdez 4 percent









# Sea Turtles - 5 spp.

Loggerhead - Threatened



Green- Endangered



Kemp's Ridley - Endangered



Hawksbill - Endangered



Others: Leatherback





# Marine Mammals

Bottlenose dolphin



Atlantic spotted dolphin



29

Species

Sperm whale



Bryde's whale



Others: Killer, beaked, melon-headed, 9 dolphin species

# OWCN Involvement

➤ 4 staff

➤ Dr. Michael Ziccardi

- Identifying facilities to care for marine mammals and sea turtles
- Development of protocols



# Protocols

- ▣ Sea Turtles
  - None compiled prior to spill
  - Draft by 9 May, revised 3x
  
- ▣ Cetacea & Manatee
  - NOAA national guidelines written in 2005
    - ▣ Minimal cetacea, no manatee
  - Draft by 6 May, final 12 Jun



# Facilities

## ▣ Primary Care

- ▣ Audubon Nature Institute
- ▣ Institute for Marine Mammal Studies
- ▣ Gulf World
- ▣ Gulfarium

## ▣ Stand-By

- ▣ Homosassas Springs
- ▣ Lowry Park Zoo

## ▣ Secondary

- ▣ Disney Living Seas
- ▣ Florida Aquarium
- ▣ Clearwater Aquarium
- ▣ Mote Marine Lab
- ▣ Sea World Orlando





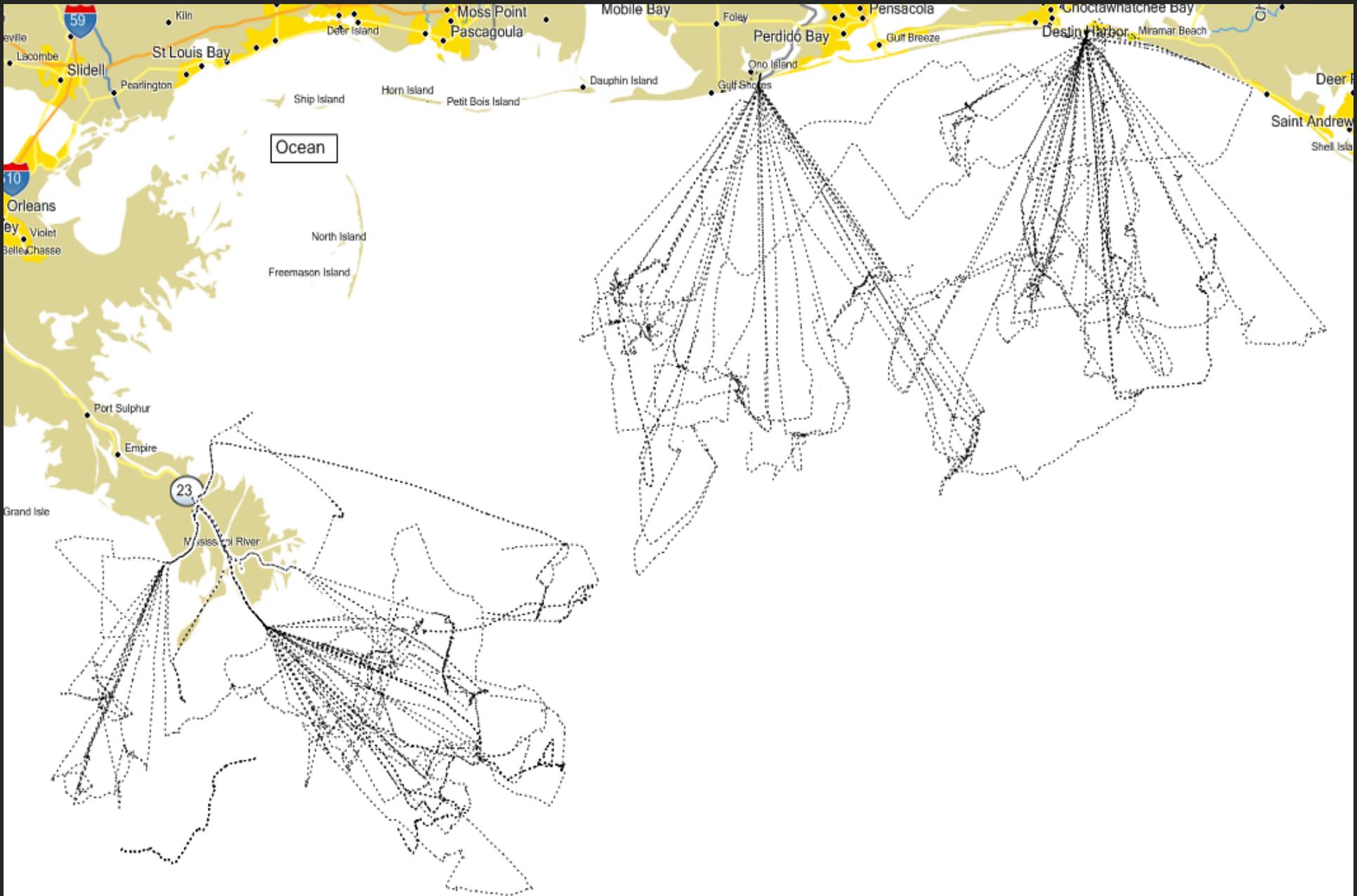


# At-Sea Captures

- ▣ 1-3 Dedicated 40-50' vessels (w/ aerial support)
- ▣ Launched from 1-3 ports
- ▣ Target search area: oil lines and oiled weed lines



# Offshore Search Efforts for Sea Turtles, 17 May – 8 August 2010







# Wildlife Impact

## ▣ Turtles

- Live: 535
- Dead: 616
- Released: 434

## ▣ Mammals

- Live: 9
- Dead: 102
- Released: 3



## Birds

- ▣ Live: 2,085
- ▣ Dead: 6,124
- ▣ Released: 1,252

**700-800 nests expected, up to 50K hatchlings!**

**# Nests Transported: 278**

**# Hatchlings Released: 14,676**





# Wildlife Observers

- ▣ Coverage:
  - 100% observer coverage for in-situ burn operations
  - 25% observer coverage for skimmers



# Future Efforts

- ▣ Release of recovered animals
- ▣ Transition from response to NRDA
- ▣ After Action Review





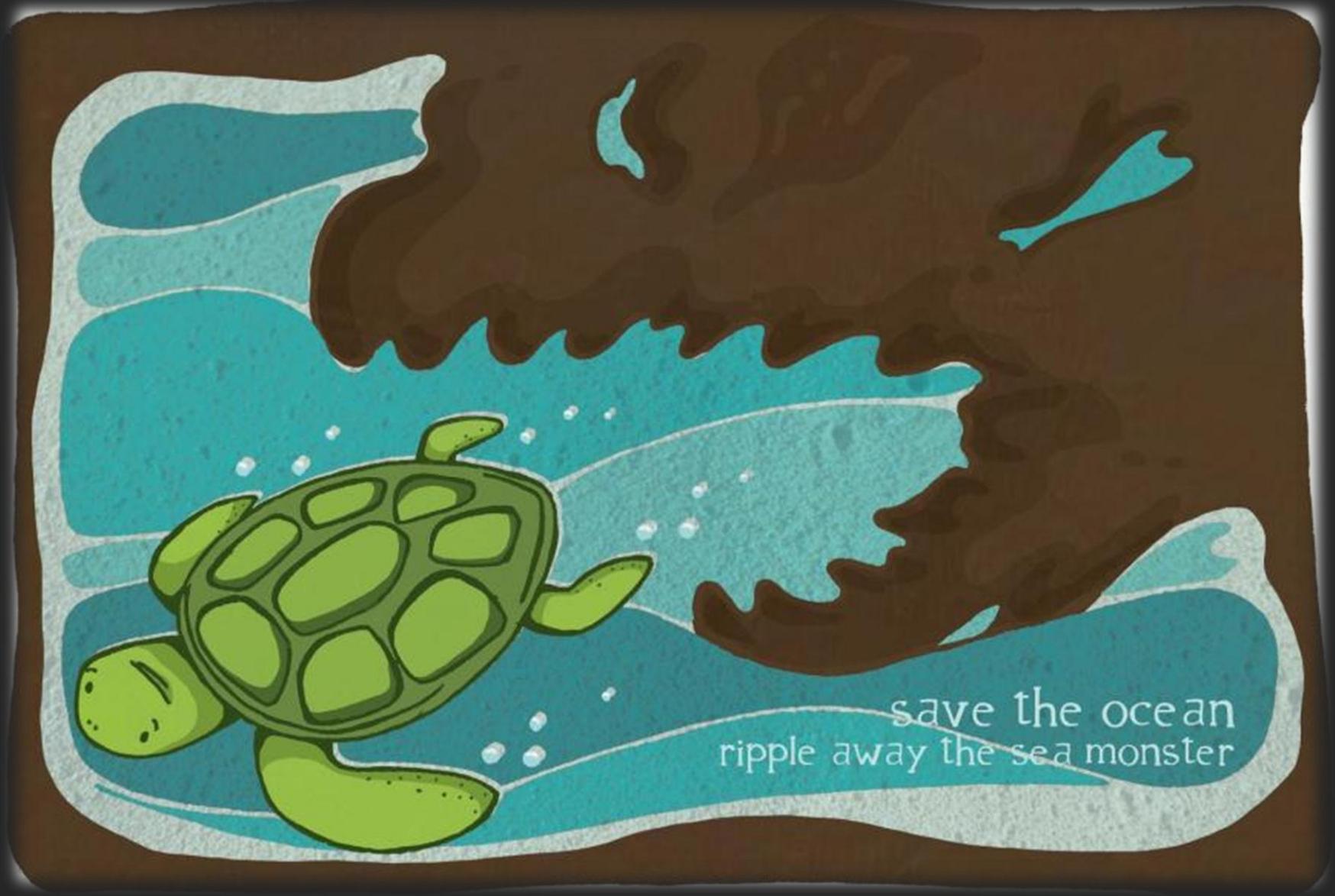








The U.S. uses about 700 millions of gallons of oil each day



Biggest source of oil pollution is non-point source from daily activities!



Christopher Richter



Questions?



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