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MMPA 50th Anniversary: Marine Mammal Health and Stranding Response Program

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- **Sarah Wilkin**, *MMHSRP Program Lead, NOAA Fisheries Office of Protected Resources*
- **David Caldwell**, *Branch of Coastal and Marine Resources, U.S. Fish and Wildlife Service*
- **Frances Gulland**, *Chair of the Marine Mammal Commission*



May 19, 2022

Role of the MMPA

- All marine mammals are protected under the MMPA
- Three federal entities share responsibility for implementing the MMPA:
 - NOAA Fisheries
 - U.S. Fish & Wildlife Service
 - Marine Mammal Commission



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Some Important Elements of the Work of NOAA Fisheries under the MMPA

- Working with stakeholders to reduce fisheries bycatch
- Managing “take” through permits and authorizations
- **Established the Marine Mammal Health and Stranding Response Program (MMHSRP)**
- Established the Unusual Mortality Event Program



50 Years of the MMPA & 30 Years of the MMHSRP

- 1972: MMPA enacted
- 1992: MMPA amended to include Title IV: MMHSRP
- Three main mandates:
 1. Health and health trends of marine mammals in the wild
 2. Explore relationships between the environment and strandings
 3. Conduct effective responses



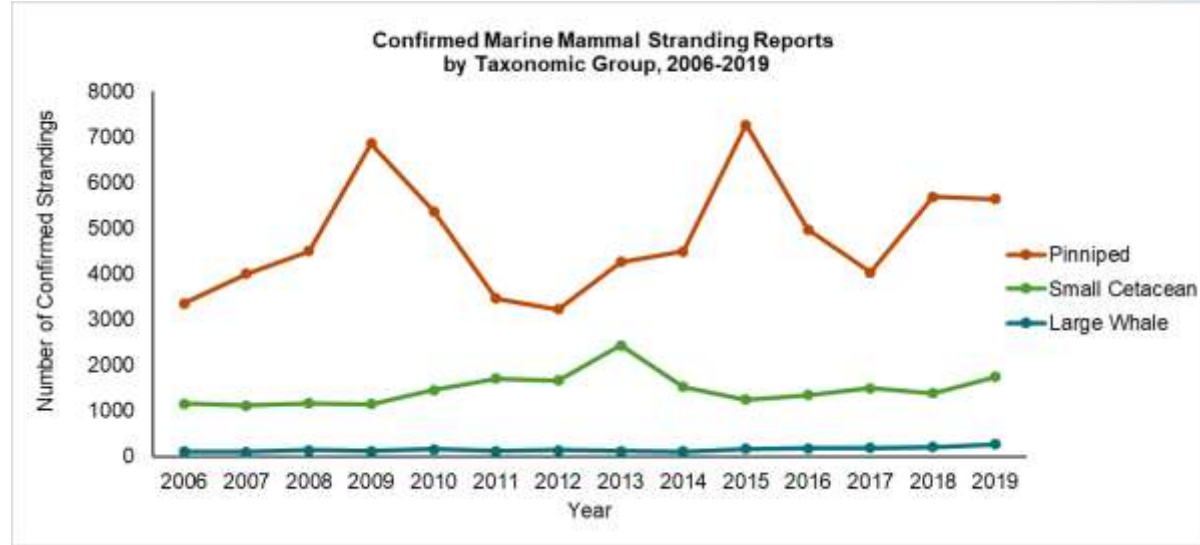
Emergency Response Activities



Photo CCS

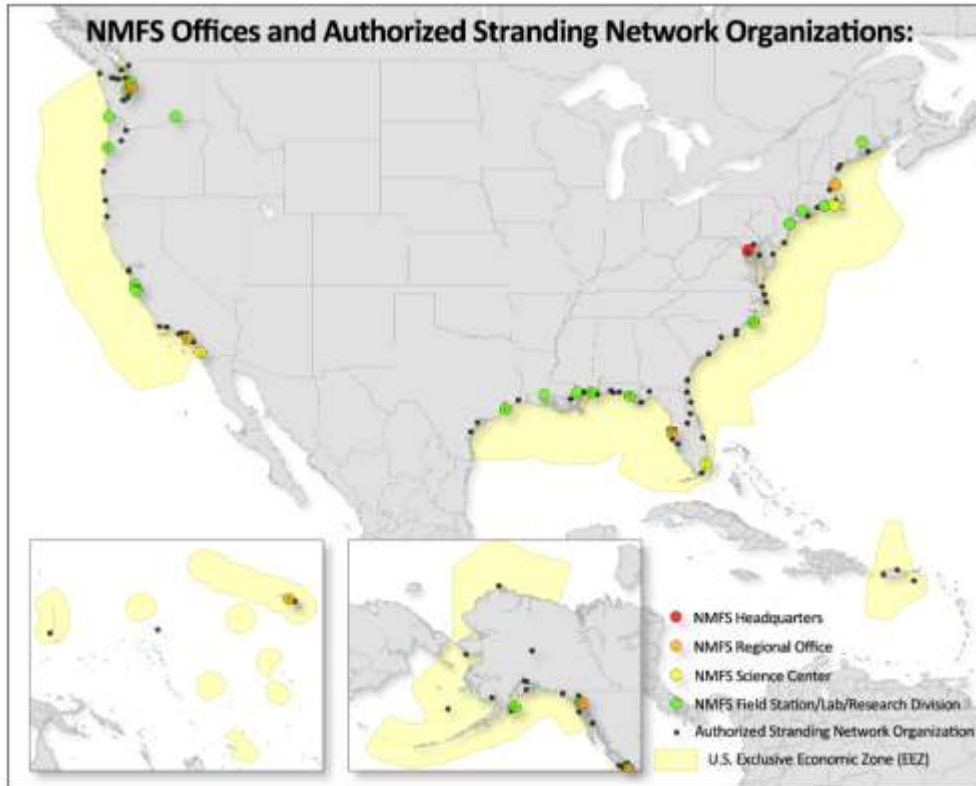


Stranding Response Program



- Annual average - 6,321 total strandings
- Stranding responses provide data for management purposes and scientific study

Stranding Response Program



- 120+ partners including:
 - Non-profits
 - Museums
 - Zoos & Aquariums
 - Federal, state & local governments
 - Universities
 - Tribes



Entanglement Response Program

- Animal welfare
- Population-level impacts
- Response conducted by trained, authorized individuals
 - **Seals & sea lions:** stranding network members
 - **Small cetaceans:** multi-agency teams of stranding network members
 - **Large whales:** separate network of dedicated responders



Photo GADNR



Photo PIFSC

Unusual Mortality Event Program



- Strandings that are:
 - Unexpected
 - Involve a significant die-off of any population
 - Demand immediate response
- 71 formally declared since 1991; 4 current UMEs
- All regions, all taxa



Photo FWC



Marine Mammal Health Research and Human Connection



Photo The Dolphin Project
NMFS Permit No. 932-1905 / MA-009526



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Biomonitoring & Health Assessments



Photo: Marine SeaWorld Research Institute

- Collection and analysis of samples to investigate health and monitor trends and long-term impacts
- Investigations of free-ranging animals



National Marine Mammal Tissue Bank

- Collaboration with National Institute of Standards and Technology
- Long-term archive with >75,000 samples from:
 - Strandings
 - Permitted research
 - Alaska Native subsistence harvests



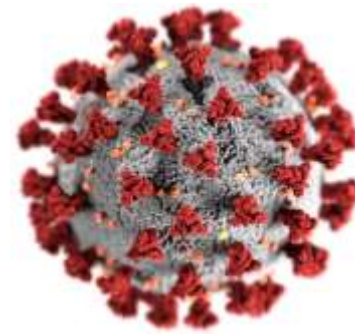
Photo NIST

Investigating Human Connections

- Stranded individuals can act as sentinels, the marine version of “Canary in a Coal Mine”, providing clues on ocean, climate, and human health
- Climate change
 - Range/distribution shifts
 - Emerging diseases
- Zoonoses



Photo Tim Kelly



Supporting Activities



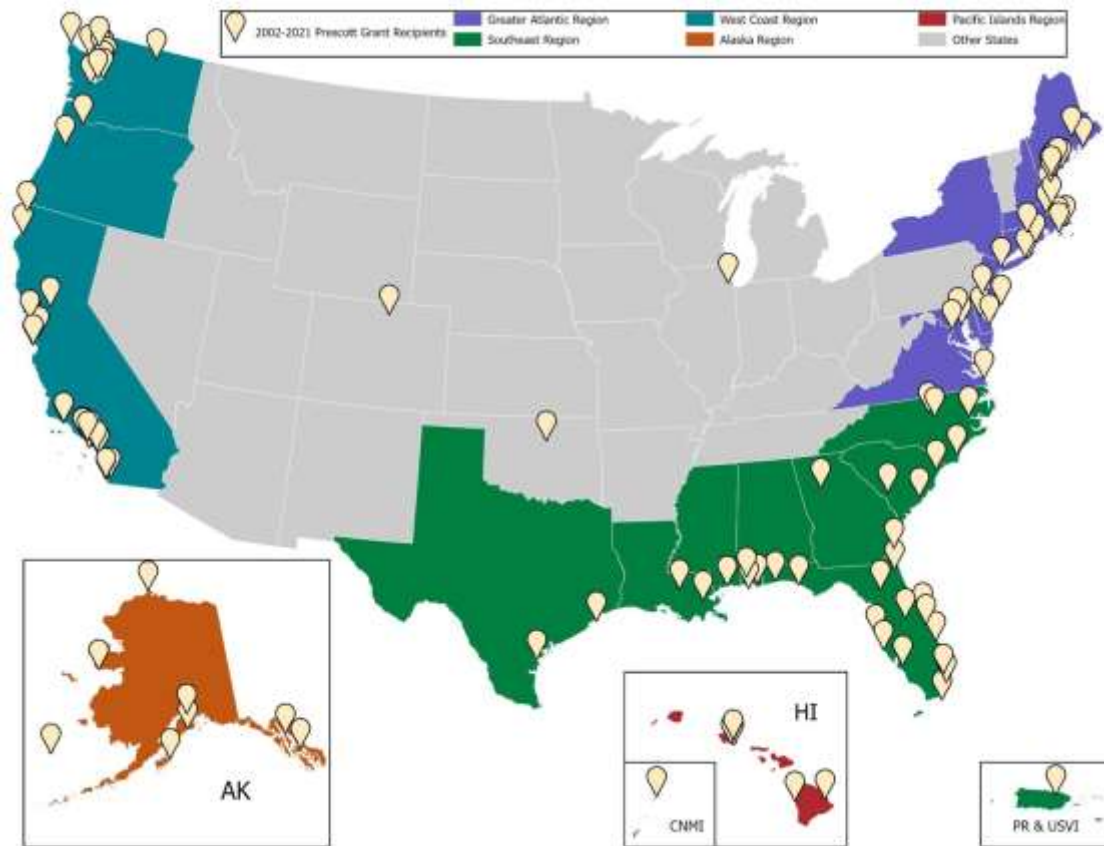
Photo AMCS



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Prescott Grant Program

- Established in 2001
- **Provided over \$67.6 million to stranding network partners through 794 grants**
- Support the rescue & rehabilitation of stranded marine mammals & data collection for health research



Marine Mammal UME Fund

- Interest-bearing fund to compensate for special costs in responding to marine mammal UMEs
- 2005 appropriation of \$800,000
- 2015 NMFS allocated an additional \$336,000
- Approximately \$81,000 remains in these funds at NMFS
 - \$33,000 - UME Fund
 - \$48,000 - NMFS dedicated funds



Photo VAQS



Photo Seacoast SC



Other Supporting Roles of the MMHSRP

- MMHSRP Permits
 - MMPA/ESA scientific research & enhancement permit
 - CITES permits
- National Marine Mammal Stranding Database
 - Compiles information nationwide on strandings
 - Complete dataset 2006-present



Photo Ocean Alliance

MMHSRP Key Take Home Messages

- The MMHSRP is hands-on conservation in action.
- Successful Public/Private Partnerships have been established.
- Marine mammals are sentinels of ocean, climate, & human health.
- There is potential for growth and future activities within the MMHSRP.



Photo HIHWNMS





John H. Prescott Grant Program U.S. Fish and Wildlife Service



David Caldwell
Branch of Coastal and Marine Resources
U.S. Fish and Wildlife Service



U.S. Fish and Wildlife Service



Service's Jurisdiction

○ **Polar Bear**

- Chukchi/Bering Seas Stock
- Southern Beaufort Sea Stock

○ **Pacific Walrus**

○ **Northern Sea Otter**

- Southwest Alaska Stock
- Southcentral Alaska Stock
- Southeast Alaska Stock
- Washington Stock

○ **Southern Sea Otter**

○ **West Indian Manatee**

- Florida Stock
- Puerto Rico Stock

Prescott Grants Awarded in each Region

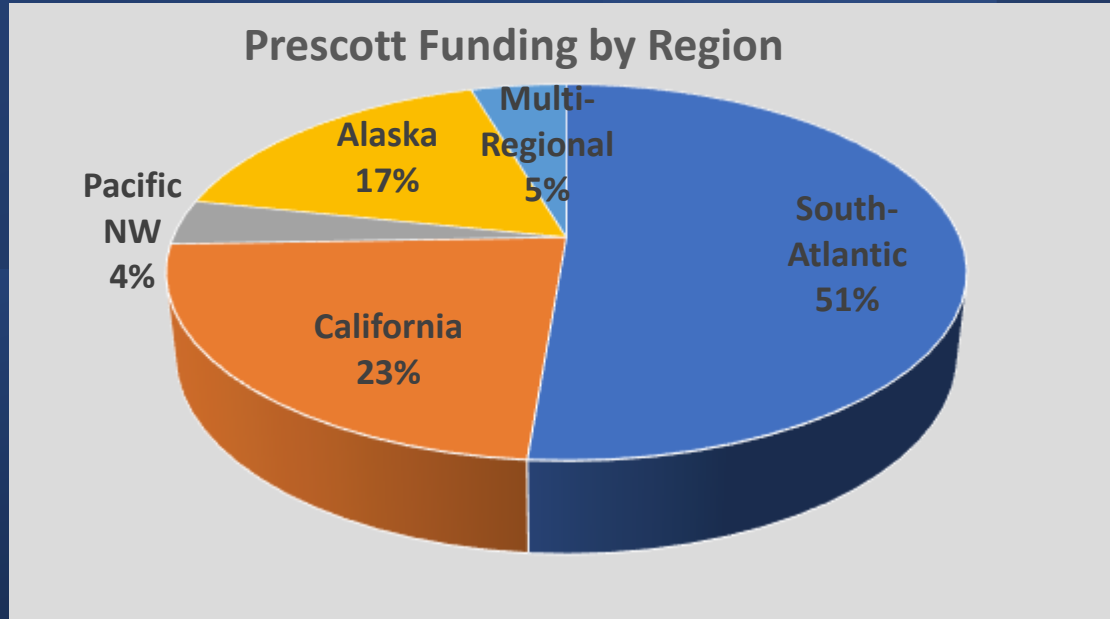


Prescott Grant Awards

\$4,300,000 (FY19-FY22)

Grants Include:

- Over \$2,000,000 towards manatee rescue and rehabilitation efforts across the Southeast and Caribbean.
- Over \$1,200,000 working along the West Coast for southern and northern sea otters.
- Over \$500,000 provided to increase training and response to oil spill response and recovery.
- These funds have been provided to state agencies, educational facilities, non for profits, and various laboratories.



U.S. Fish and Wildlife Service

Conservation in Action

- Since inception in 2019 over \$4,300,000 awarded
- Support to:
 - various state and local agencies,
 - academic institutions,
 - and not for profit conservation groups.
- Purchase of:
 - essential monitoring equipment,
 - vehicles for land and water,
 - Equipment to improve and expand rehabilitation capabilities.
- Provide:
 - Training for response to major disasters,
 - Outreach and Educational Events for the Public.



Funding in Action



People in Action

Polar Bear Cubs in Alaska
Polar Bear Oiling Response
Pacific Walrus Group
Northern Sea Otter Group
Marine Mammal Multi-Species Group
Manatee Rescue and Rehabilitation
West Coast Marine Mammal Stranding Network



- Over 75 entities participate in the groups listed above.
- Groups include Tribal, State, and Local Governments, educational institutions, zoos, aquariums, not for profits, and public volunteers.



People are saying
great things about
the Prescott Grant
Program!



“...In these challenging times, financial support is vital as we continue to rescue and rehabilitate stranded sea otters, releasing them in places where they can help restore coastal ecosystems...”

- Julie Packard, Executive Director of the Monterey Bay Aquarium.

"Prescott Grants will play an important role in providing the Caribbean Manatee Conservation Center with much needed equipment and supplies to carry out its response to strandings, enhance veterinary care, continue rehabilitation efforts and conduct post-release monitoring," said Dr. Antonio Mignucci, Director of the Caribbean Manatee Conservation Center.

Thank you for supporting the Prescott Grant Program.





Marine Mammal Commission

An independent agency of the U.S. Government

Marine Mammal Health and Stranding Response Program

Frances M.D. Gulland Vet MB, PhD

Chair, Marine Mammal Commission

May 19th 2022



Veterinarian
The Marine Mammal Center 1994-2019



Commissioner
Marine Mammal Commission 2011-2022



Goals of the Stranding Network

- Title IV MMPA:
 - Data on health and health trends in marine mammals
 - Correlate health data with environmental parameters
 - Coordinate effective responses to unusual mortality events
- Network members:
 - Enhance animal welfare
 - Science on biology and life history of marine mammals
 - Determine causes of stranding, disease & die-offs
 - Treat wounds and diseases to release stranded animals after rehabilitation
- Vision:
 - Biomonitoring program to detect
 - ocean changes impacting marine mammals
 - efficacy of mitigation measures to conserve marine mammals



Health Changes Detected by the Stranding Network & MMHSRP

- **Trauma**
 - Vessel strikes
 - Entanglements
 - Plastics in stomach
- **Infectious diseases**
 - Viral epidemics
 - Leptospirosis
- **Malnutrition**
 - Prey loss due to overfishing, pollution
- **Toxicoses**
 - Oil damage post spills
 - Harmful algal bloom poisoning
- **Degenerative diseases**
 - Cancer



Domoic Acid Poisoning of Sea Lions

- Domoic acid toxicosis first diagnosed in marine mammals in 1998, causes seizures, death
- In 1998 sea lions ate anchovies and sardines containing domoic acid
- Good correlations among bloom, toxin levels in water and prey, strandings, histological lesions and prey in sea lions
- Mortality in sea lions before toxin detected in mussels as ate “bait balls”
- Fishery closures to protect human health



Sub-lethal Effects Detected

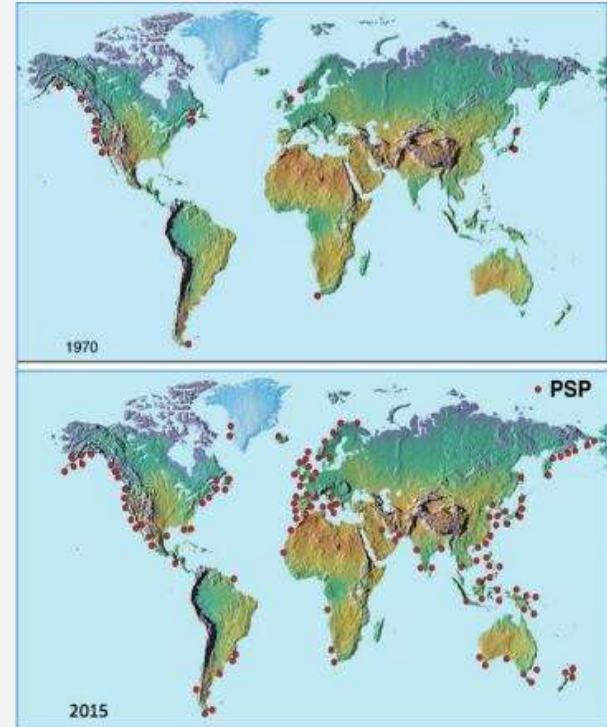
- Abortion
- Brain damage – hippocampal atrophy
- Loss of sense of smell
- Memory loss

Chronic effects due to low level exposure are relevant to human health: humans may be exposed when seafood is contaminated at levels below threshold triggering fishery closures.



Harmful Alga Blooms are Increasing Globally

- Domoic acid
 - Blooms extending along west coast USA to Alaska
- Saxitoxin (paralytic shellfish poisoning)
 - Mortality of humpback whales New England
 - Sea otters in Alaska
- Brevetoxin
 - Repeated mortality events in manatees, bottlenose dolphins in Florida
- Ciguatoxin
 - Monk seals in Hawaiian waters



Cancer in 20 % adult dead stranded California sea lions

- 17% of adult California sea lions examined post mortem have cancer
- Highest prevalence of cancer in any U.S. wildlife species
- Reproductive tract carcinoma
- Death due to cancer spread
- Herpesvirus in cancer tissues
- Sea lions with cancer have significantly higher levels of DDTs and PCBs
- DDT contamination of California coast persists due to underwater dumping



Trauma

- Diagnosis of cause of the trauma identifies frequency, location of human induced trauma
- Diagnosis made by independent veterinarians, pathologists, biologists
- Long term data allows evaluation of the efficacy mitigation measures such as vessel speed reduction, fishery closures, fishing gear modifications

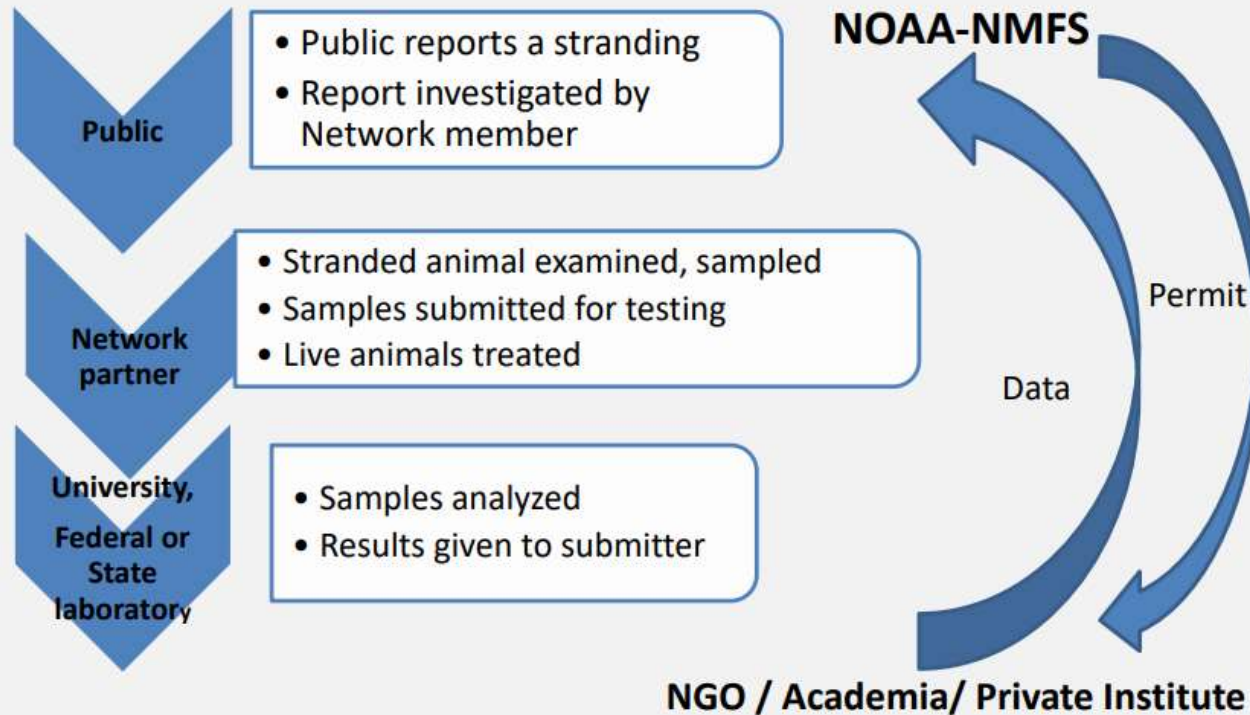


Stranding Network as a Biomonitoring Program

- Entire U.S coastline covered by partners permitted under the MMPA to respond to stranded marine mammals
- Partnerships with academia, veterinary schools, state and other federal laboratories vital in disease diagnosis and therapeutics development
- Capacity varies regionally
- Regional differences due to varied extent of partnerships, training, interests beyond welfare response
- Regional differences in ratio of federal/private funding



Stranding Network is a Public-Private Partnership





Future Directions

- **Invest in further fulfilling mandates of Title IV of the MMPA**
 - *Data on health and health trends in marine mammals*
 - *Correlate health data with environmental parameters*
 - *Coordinate effective responses to unusual mortality events*
- **Develop diagnostic capacity for areas without local academic or laboratory support**
 - Integrate marine mammal health assessments with terrestrial wildlife health programs
- **Integrate stranding and health data with environmental variables**
 - Understand and potentially mitigate impacts of ocean changes on marine mammal health
- **Identify impacts of climate change on marine mammals**
- **Increase real-time access to data on causes of stranding**
 - Enhance utility for guiding mitigation measures





Photo TMMC



Photo NMFS



Photo Ocean Alliance

Q&A Session

Please submit any questions or comments in the question box!



Upcoming MMPA Briefings

- Summer 2022: Permits and Authorizations
- Fall 2022: Bycatch



Next Year:

*The 50th anniversary celebration of the
ESA in 2023!*



Thank you!

For additional information, please contact

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