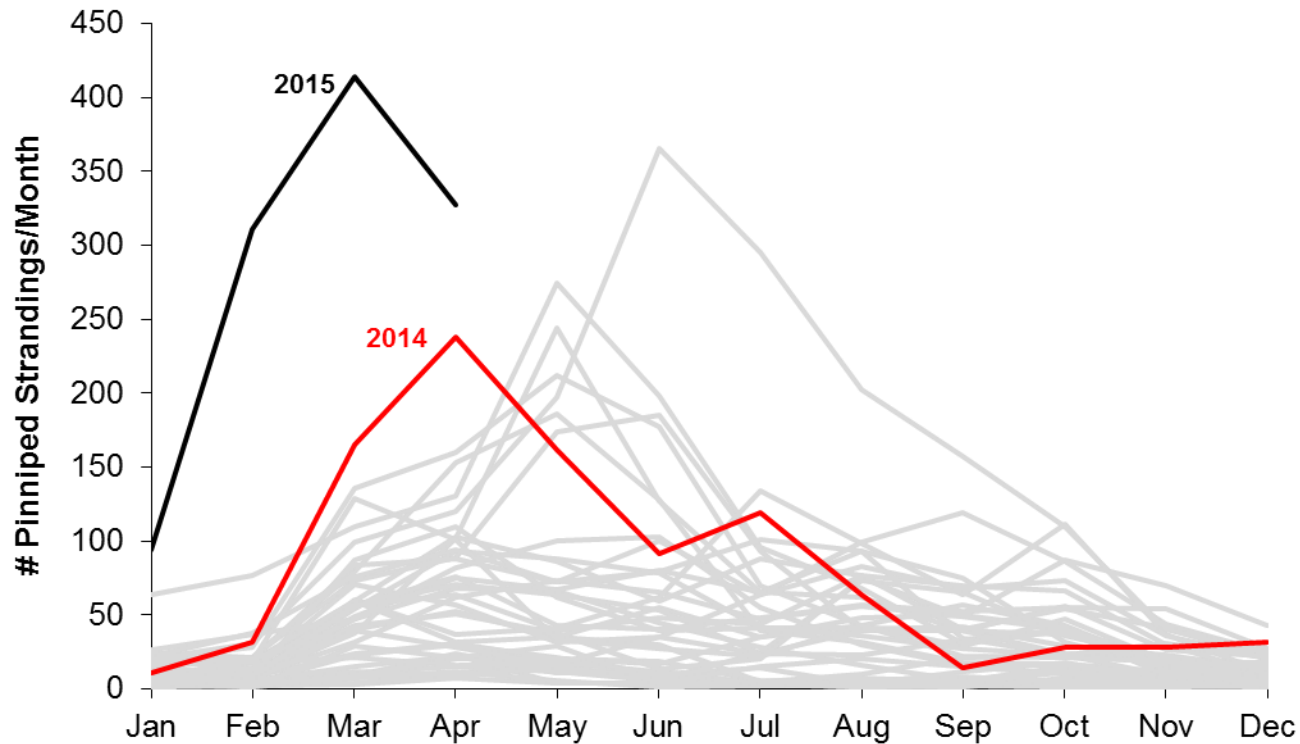


Recent Anomalies in Pinniped Stranding Trends Along the Central California Coast



The Marine
Mammal Center®

Tenaya Norris,
Shawn Johnson,
Frances Gulland

The Marine Mammal Center



Fort Bragg
Operations

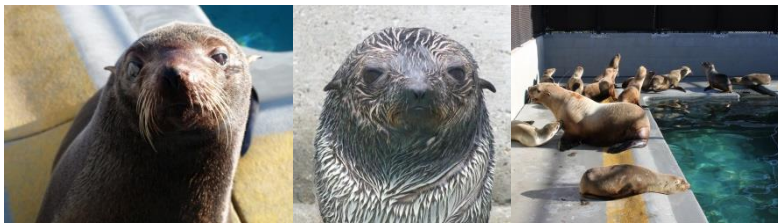
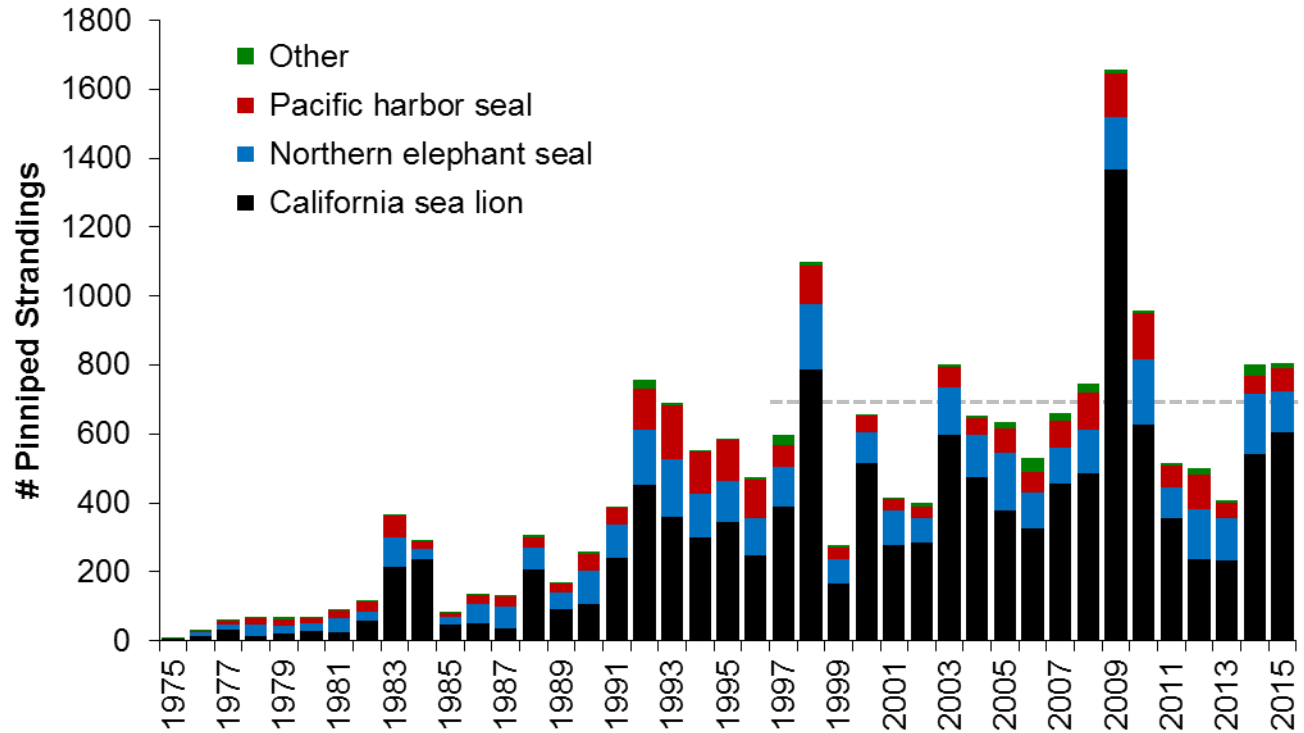
Anchor Bay
Operations

Sausalito Headquarters
and Hospital

Monterey Bay Operations

San Luis Obispo Operations

Annual Number of Stranded Pinnipeds



| | 2014 | 2015 |
|---------------------------|------|------|
| Mendocino-San Luis Obispo | 802 | 804 |
| + Santa Barbara | 968 | 1146 |

Guadalupe fur seal

Northern fur seal

Steller sea lion

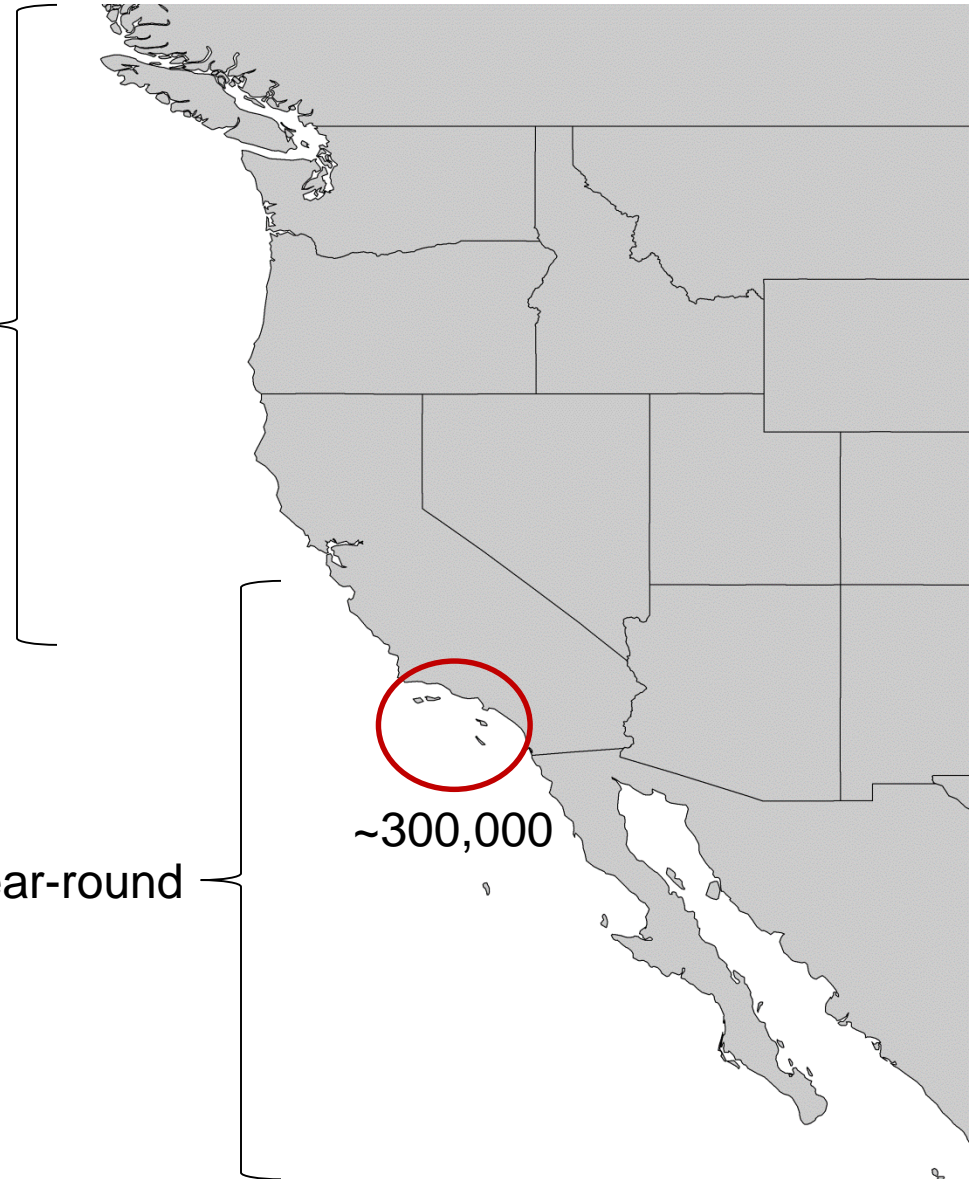
California Sea Lion (CSL)



Sep to May

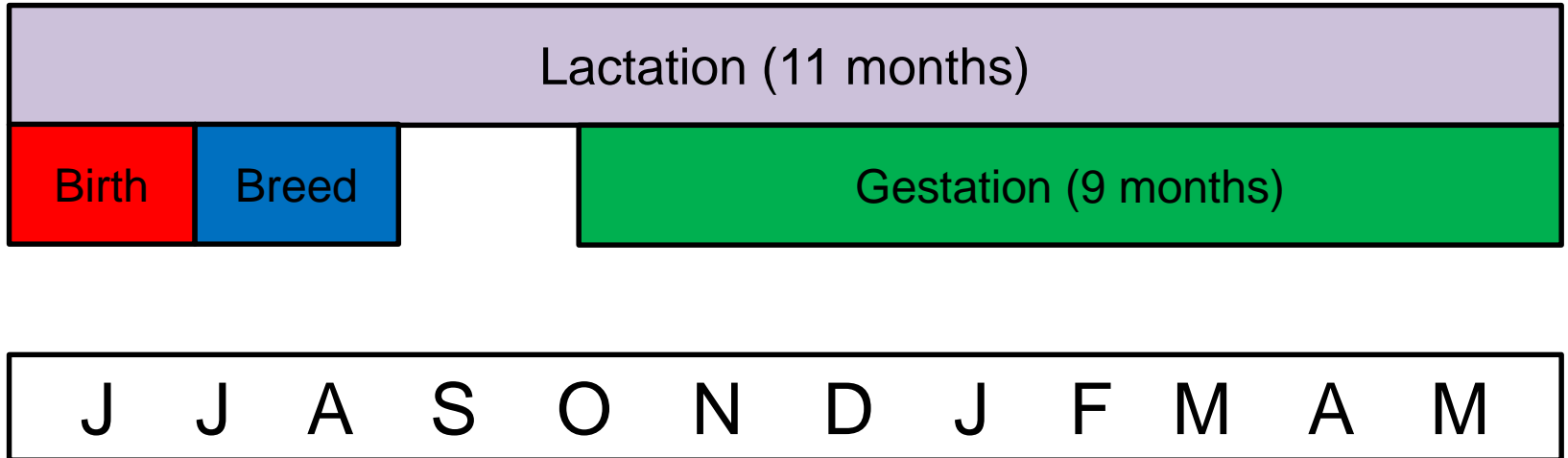


Year-round

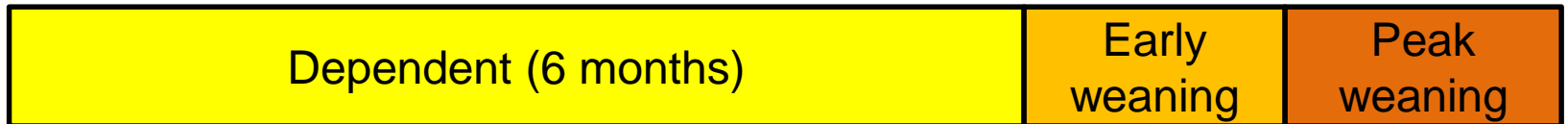


CSL Annual Cycle

Adult Females

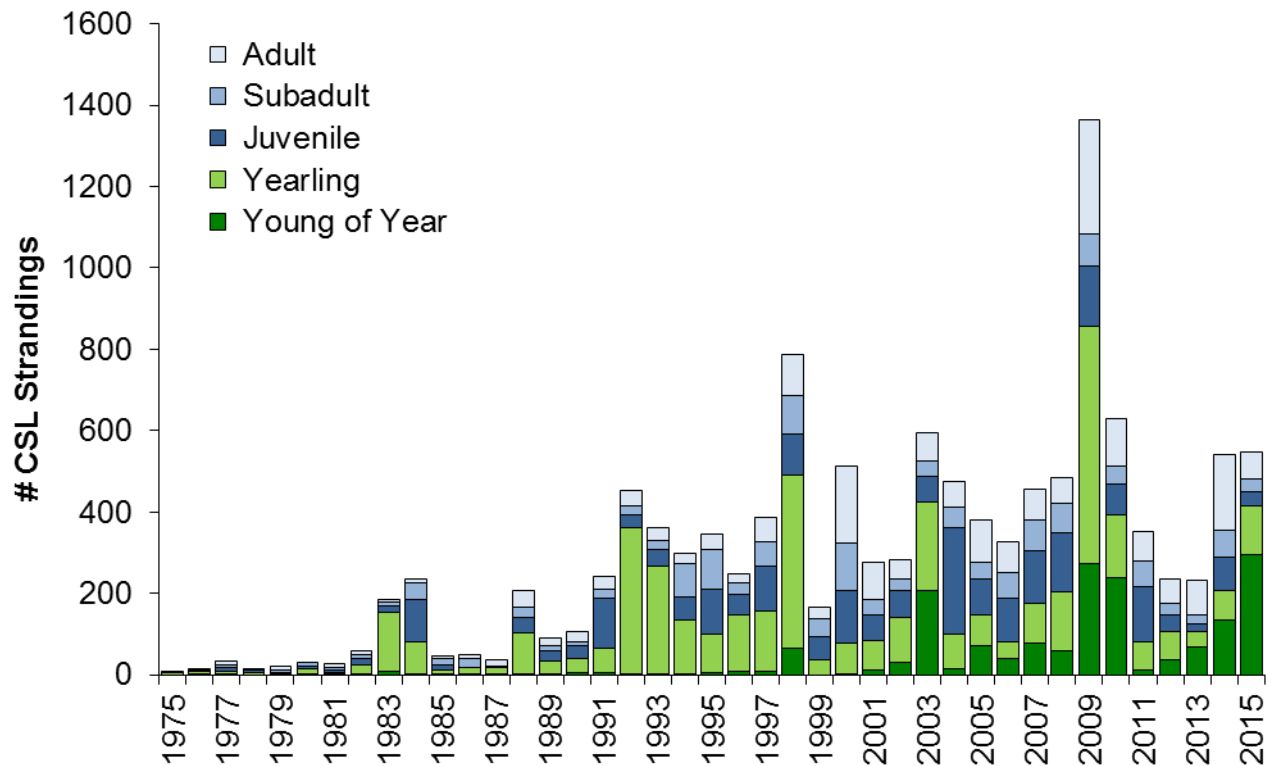


Pups

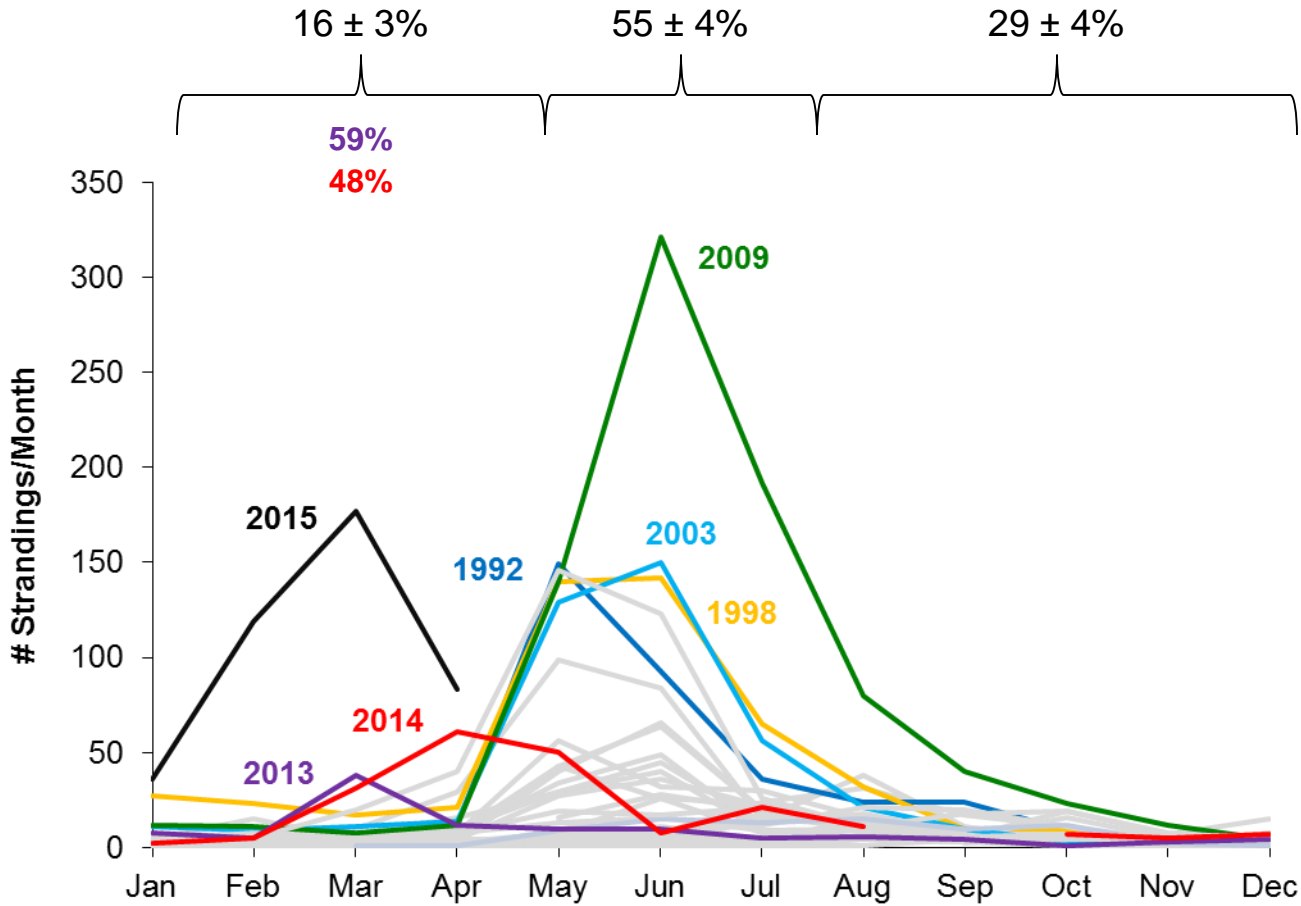


CSL Primary Causes of Stranding

- Green shading: Malnutrition/failure to find enough food
- Blue shading: Infectious disease/biotoxicosis/etc.



Monthly CSL Strandings, age 0-2 years



Guadalupe Fur Seal

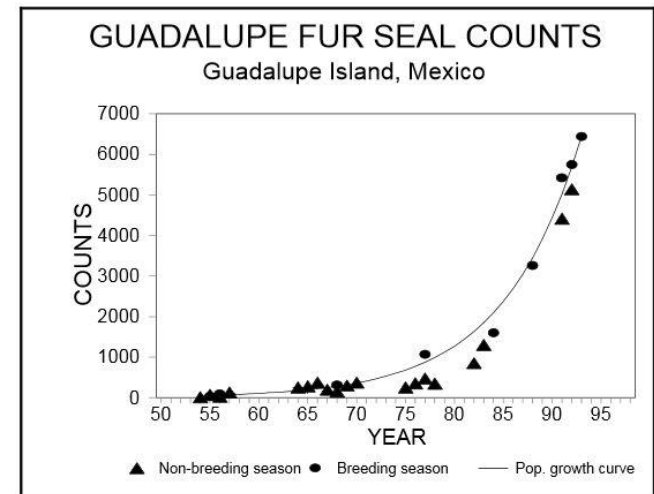
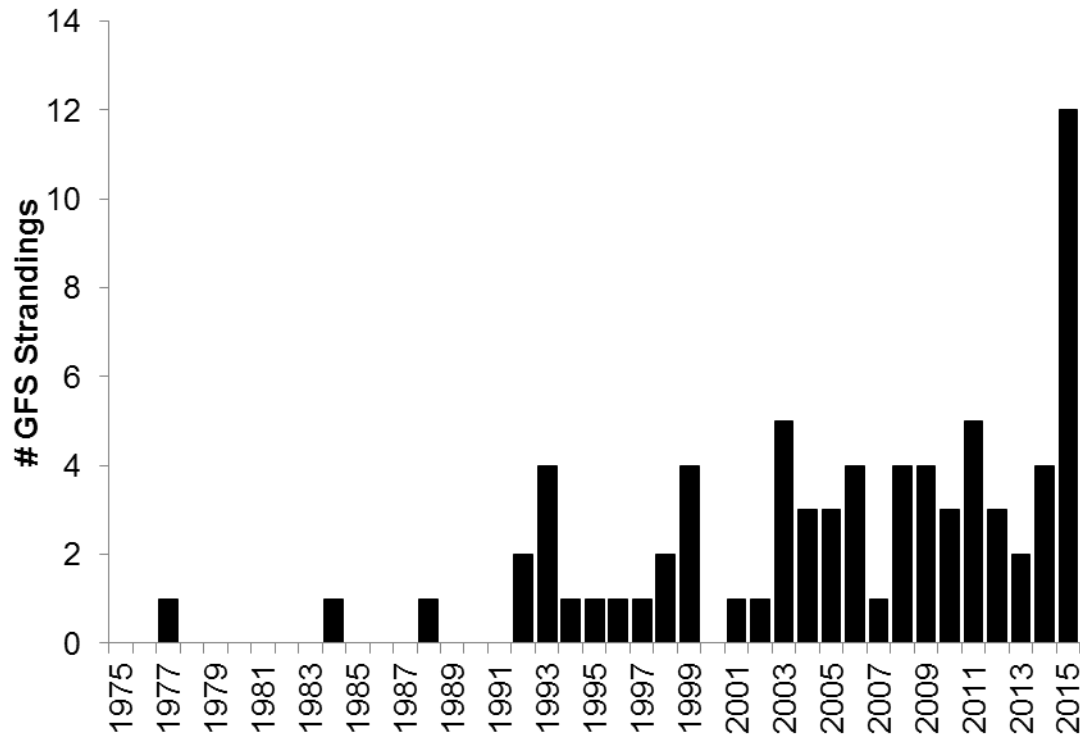


Figure 2. Counts of Guadalupe fur seals at Guadalupe Island, Mexico, and the estimated population growth curve derived from counts made during the breeding season.

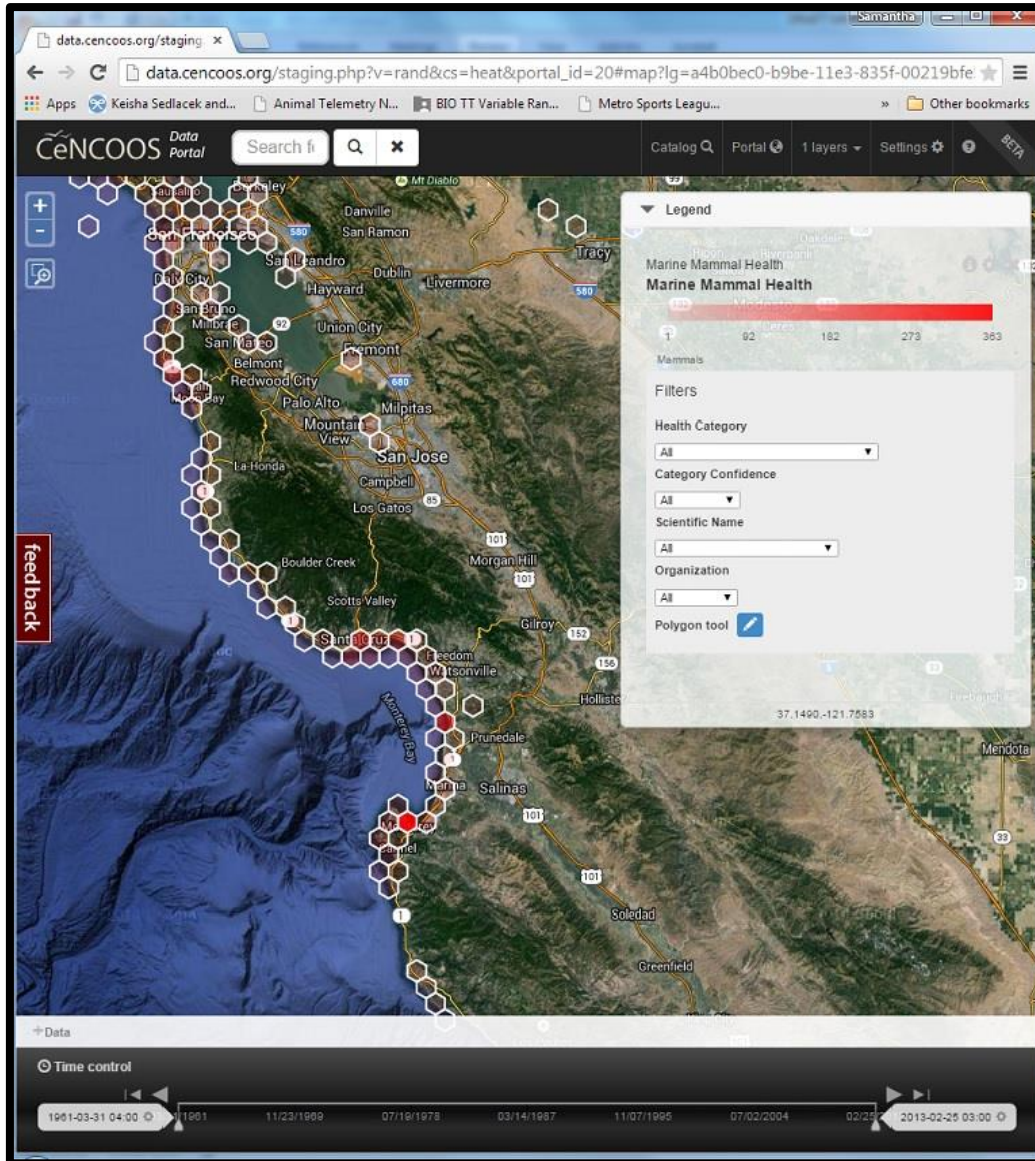
Conclusions

- Increased number of stranded pinnipeds on California beaches in 2014 and Spring 2015
 - Similar to previous years with anomalously warm waters in California Current System
 - CSL < 2 yrs old particularly vulnerable
- Recent shift in peak CSL strandings (age 0-2 yrs) from summer to spring
 - Lactating females unable to adequately provision pups
 - May indicate greater depletion of/changes to fish stocks than previous years with persistent, large-scale oceanographic anomalies
- Record number of Guadalupe fur seal strandings in 2015
 - Expected to do slightly better with warm waters
 - Really bad out there

Marine Mammal Health Monitoring and Analysis Platform (MMHMAP)

- Marine mammals
 - Integral component of marine ecosystems
 - Sentinel species for ocean and human health
 - Generate considerable public interest
- But marine mammal health and stranding data currently not readily accessible or integrated with oceanographic data
- Idea is to collate marine mammal data into a database
 - Compatible for integration with environmental datasets
 - Accessible by the public, managers, scientists within the Integrated Ocean Observing System (IOOS)

Marine Mammal Health Monitoring and Analysis Platform (MMHMAP)



Adult Female CSL Movements

2-4 days at sea
1-2 days nursing

5-75 m → primary diving
(dive as deep as 600 m when need to)

