Notes on their work

**1. Project Title: EcoCatch: Improving ecological and economic sustainability of marine**

**fisheries using remotely-sensed oceanographic data**

**NASA, Sara Maxwell**

-Target fishery: drift gillnet for swordfish

-Target species: swordfish

-Bycatch species: leatherback turtles, California sea lions, blue sharks

-data: satellite tracking and fishery observer

Analysis

1. habitat suitability for bycatch species

2. ‘catch suitability’ for all species: e.g. if particular environmental conditions are associated with the catch and bycatch events\

3. combine 1&2 to create EcoCatch model: catch and bycatch probability across the seascape

Probability of bycatch for a species = habitat suitability + predicted interaction + error

Idea: for layers, bycatch probability for 3 bycatch species, catch suitability for swordfish, input to marxan, objective: avoid areas of high bycatch probability, at the cost of avoiding areas that are suitable for catching sword fish

**2. Project Title: Integrating Survey-Based Habitat Models into the California Swordfish Fishery Dynamic Management Tool**

**SeaGrant**

Similar to 1, but EcoCast, mobile application for fishermen in real-time

-Target fishery: drift gillnet for swordfish

-Target species: swordfish

-Bycatch species: leatherback trutles, California sea lions, blue sharks, **thinking of adding cetaceans**

Approach: EcoCast app that collects opportunistic sightings, will so make dynamic bycatch probability available to managers and fishermen in near-real-time

-Models for blue shark, California sea lions, and leatherbacks are done

-Sea Grant funds are allowing for cetacean density to be included

-data: systematic shipboard surveys, observer data

1. build habitat density models (ROMS)

2. fishery-interaction models

3. combine 1&2 to get bycatch probability models

4. include models for swordfish catch

ROMS: 1. High spatial and temporal resolution, 2. Nowcasts, 3. Sub-surface predictor variables

**3. Project Title: National Marine Sanctuaries as Sentinel Sites for a Demonstration Marine Biodiversity Observation Network (MBON)**

-Implement a Marine Biodiversity Observation Network in the Florida Keys and Monterey Bay

1. baseline information on ecosystem characteristics, evaluate the spatial extent and time of changes in biological communities

2. understand patterns and processes (remotesensing) underlaying ecosystem variability

Idea: 1. Model species at high temporal resolution, 2. Cluster into communities (assemblages), 2. Weed out species that don’t really fit within assemblages, 4. Weed out pixels that don’t really fit within assemblages, 5. Run analysis of cluster similarity across time to see if same community appears at multiple time periods

Idea 2: similar to hobday 2011, where he tracked pelagic habitats defined as clusters of 5 oceanographic variables thru time.

**4. Project title: Interactions among behavioral responses of baleen whales to acoustic stimuli, oceanographic features, and prey availability**

Overview: understand distribution and density of prey for mysticete cetaceans during behavioral response studies investigating their reactions to human sound exposure

Why: where and why they are moving and related to an area. Blue whales that are surface feeding on krill shown to respond less to sound whereas deep-feeding whales appeared to be more effected. Correlate appears to be the specific mode of feeding and prey availability in the water column

**Our hypotheses are:** 1) whale consumption rates and foraging behaviors are related to prey distribution and biomass at the scale of the individual whale (i.e. 10s to 1000s of meters); 2) oceanographic processes (e.g. increased phytoplankton) and physical features (e.g. 200m isobaths) in the SCB enhance prey availability, leading to localized habitat use patterns for foraging whales. 3) foraging behavior (e.g. surface lunges, deep dives) will be directly related to prey density. Ultimately, this information can be used to test whether at high prey densities, foraging whales are less affected by anthropogenic playbacks than at lower prey densities.

**5. Project title: El Niño Watch revised - An improved index for reducing Loggerhead Turtle bycatch in the California Current**

**Objectives:**

-develop a habitat model for loggerhead in the California current

-validate models using newly collected satellite telemetry and aerial survey data

-develop an improved closure rule, based on regional environmental data (and incorporate it into existing California drift gillnet studies)

**Background:**

Seasonal drift gillnet closure in place for loggerhead when particular oceanographic conditions are present (june, july and august when an El Nino event is occurring or forecast

Goal: develop an improved, spatial and temporally-explicit closure rule

1. thermal sst indices

2. niche models (single models and aggregated)

3. validate using telemetry

4. develop time/area closure rules similar to hobday for Bluefin

Idea: similar to hobday. Model habitats in at multiple time steps, across multiple timesteps (e.g. months), define core, buffer and ok, at 80:15:5% of percent habitat distribution (i.e.model distribution, divide habitat preference map (e.g. the amount of time species spent at each area into management zones)