ELEPHANT SEAL RESEARCH QUESTIONS

1. Are elephant seals good indicators of marine ecosystem condition as selected by NPS I&M program based on environmental effects on productivity and distribution, including but not limited to:
   1. ENSO events - are there larger scale or smaller scale effects on productivity and expansion, and sex
      1. *Plot ENSO vs new subcolonies established each year at PORE. (maybe part of discussion?*
   2. Aspect and swell effects on mortality and expansion of new colonies
      1. *BEN REVISIT THE 2018 SWELL CODE. TIE TO GCC.*
   3. Salmonid cycles; do eseal seal numbers/productivity correlate to
      1. *Get I&M salmon data and correlations with eSeals? Check Sydemans papers*
2. Do public interactions affect expansion into new colonies
   1. *in discussion? Avoid public areas? KOTA paper? New colonies not centers of use except Drakes Beach during shutdown.*
3. What is age of females that initiate new colonies.
   1. *Mostly young females from Farallones and a few from PORE. Usually not tagged. Could do* ***for south beach, drakes beach 1 and DB2 and gus’ cove****.* ***Main Colony*** *not much tagging until 88, but look at tags from 1984 – 1988 for ages.*
   2. *Codde check Database for all female tag ages for first 3-5 years at each of the 5 sites.*
4. Where do seals come from that breed at PORE, what is likelihood that they will return to breed at PORE.
   1. *Ramona data and inferences from count data - Done*
5. Model population trends for future under different scenarios for ENSO events. If ENSO similar to 1998 occurred every 2 years versus every 5 years, what would be population trend
   1. *Simulate lambda with varying ENSO strength and frequencies. 1998 = strong. Assume space not limited, 20-30 year projection.*
6. Model population expansion for future under different scenarios of SLR, by eliminating cliff backed beaches such as DB1 with updated IPCC sea level rises predictions.
   1. *Revisit KOTA paper with new information on SLR and IPCC predictions.*

*2 PAPERS!*

Multi-author paper on 4 sites mostly on intercolony interactions.

PORE Allen/Codde/Becker paper