AI ecosystem assessment workshop
September 28-29, 2011

Participants (day 1):
<u>FEP team</u>: Diana Evans, John Olson, Sandra Lowe, Steve Barbeaux, Stephani Zador, Kerim Aydin, Francis Wiese, Carol Ladd
<u>Other</u>: Chris Rooper, Lowell Fritz, Paul Wade, Jon Warrenchuk, Nick Bond, Kim Parsons (NMML), Matt Baker, John Piatt, Libby Loggerwell, Dave Fraser
<u>Teleconference</u>: Jeff Williams, Jim Estes (intermittent), Steve Jewett, Melanie Brown, Doug Burns

<u>Core writing group (day 2)</u>: Stephani Zador, Kerim Aydin, Ivonne Ortiz, Steve Barbeaux, Chris Rooper, Carol Ladd, Sandra Lowe, Diana Evans

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Plan: divide AI ecosystem assessment into three ecoregions: Western AI (Area 543 - Russian border (Stalemate Bank) to Kiska pass); Central AI (Areas 541 and 542 - Kiska Pass to Samalga Pass); Eastern AI (Samalga Pass to False Pass). Identify indicators and potentially indicator sites for each ecoregion. To extent possible, synthesize information for AI subarea (541, 542, 543) for Council as intro to assessment.

<u>Indicators to be used in each ecoregion</u> (to the extent possible)
1990-present if possible, in most cases; further years if easily available

Human indicators: important to include this component in the ecosystem assessment, because no other source of information addresses these indicators at the spatial scale that is important for the AI
Ask Ron Felthoven for data; DE can ask Mike Fey too
- **number of children enrolled in school**
  > Central AI – Adak, Atka
  > Eastern AI – Nikolski, Unalaska, Akutan, False Pass
  - Shows recruitment into the community, sign of vibrant communities
  - Management implication: national standard requirement to consider participation and sustainability of fishing communities
  - Suggest time series not go too far back (don't include communities

- **exvessel value of catch**
  - Shows health of fisheries

Habitat indicators:
- **percent of shelf ≤500m trawled cumulatively**
  > Central AI: consider splitting out 541 and 542
  - Compare with annual result to see whether fishing effort is occurring in new areas (5km^2 blocks) or existing areas.
  - *Steve*

- **percent of shelf ≤500m trawled annually**
  > Central AI: consider splitting out 541 and 542
  - Shows spatial impact/physical habitat alteration due to fishing in each area.
  - *Steve*

Clarify in discussion of indicator that this is percentage of 5 km blocks, in which some trawling has occurred

Include in assessment but not in report card: density of fishing – indicated by percent of trawling in occurring in blocks with more than 200 tows; show map. (**Figure out whether possible to show 2011, given confidentiality; **current map legend has arbitrary breaks at 1-10; 10-20; 20+; are these the appropriate breaks?)

Apex predator indicators:
- **count of SSL non-pups**
  - change time period for evaluating the trend to 10 years.
  - Management implication: endangered status and implications on spatial management around areas. Also they are potential competitors with the fishery
  - *Stephani already has data*

- **biomass of apex predators (represented by Pacific cod **discuss further)**
  - **Other members of the apex predator guild are variably represented; is cod best indicator? Is it worth including given that trends will be shown in the cod stock assessment?**
  - *Ivonne is going to explore best rationale for which species*

Fish indicators:
- **proportion of hexagrammids versus gadids in puffin diet** (as fed to chicks)
    Western AI: at Buldir
    Eastern AI (BS/GOA): at Aiktak (Unimak Pass), at Bogoslof
  - tracks atka mackerel
  Stephani will develop with Jeff Williams help

- **biomass of pelagic foragers (represented by POP and pollock)**
  - Indicator doesn't use atka mackerel and northern rockfish as their distribution is patchy, and inclusion would lead to spatial distribution being dominated by a few catches.
  - *Ivonne*

Forage fish indicators:
- **reproductive anomalies of crested auklet**
    Western AI: at Buldir (time series 1988-2010)
    Central AI (541/542): at ?
    Eastern AI (BS/GOA): don't occur there; could substitute storm petrel (eat copepods and myctophids)
  - crested auklets eat euphausiids and larger copepods (cristatus); reproductive success of crested auklets is an integrated indicator
  - management implication: zooplankton productivity, forage fish for commercial species (eg pollock)
  - *Stephani with Jeff Williams*

- **reproductive anomalies of least auklet**
  - Western AI: at Buldir
  - Central AI (541/542): at Kasatochi
  - Eastern AI (BS/GOA): at ?
    - least auklets eat copepods (cristatus and smaller ones); reproductive success of least auklets is an integrated indicator
    - *Stephani with Jeff Williams*

Physical indicators: include paragraph that focuses on data needs, that we don't know many of the mechanisms showing how these physical forcing indicators drive biological conditions, however we surmise that they must

- **winter Aleutian Low pressure index**
  - same indicator for all regions, but may have a different effect in each region.
  - article suggests that winter Aleutian Low pressure index may correlate to productivity among species, likely through control of water temperature and prey availability.
  - Management implication: surmise from the article, how it influences the regions differently
  - *Carol*

- **transition from winter storms: average sea level pressure in month of May**
  - same indicator for all regions, but may have a different effect in each region.
  - indicator of end of winter stormy season. If winter storms go on too long, then they are likely to affect the spring transition, and the timing of the spring bloom. Spring transition allows vertical stratification to set up, so production can stay up in surface.
  - *Carol – may also end up using spring Aleutian low pressure index for this indicator*

- **Bottom temperature**
  - *Chris*

Nearshore indicators

- **Otter density index**
  - Management implication: measure of nearshore, suspect connections to atka mackerel nursery areas
  - *Libby – work with Jim Estes to work up data*

- **proportion of sand lance in puffin diet** (as fed to chicks)
  - Western AI: at Buldir
  - Eastern AI (BS/GOA): at Aiktak (Unimak Pass), at Bogoslof
    - nearshore indicator. Availability of forage fish as diet for pollock, others. Indicate system-level productivity.
  - *Stephani will develop with Jeff Williams help*

Summary

- How AI is different from BS
- Synthesize for AI subarea

Data gaps and needs
- Physical mechanisms (Carol)
- Myctophids, squid, small pelagic – no direct measures (some indirect through seabird diets (Ivonne)
- EMAP – nearshore mapping of benthic habitat for water quality, contaminants – baseline in AI in 2009(?) (Steve Jewett email)
- Deep sea coral research starting 2012 (Chris paragraph); also ocean acidification
- Nearshore camera work on first 100m rocky areas (Libby)

2011 HOT TOPICS
- talk about SSL regulatory changes and changes in fishing patterns – include other Steve metrics (density of fishing – number of blocks with more than 200 tows (map), also percentage of regulatory open area that is being fished)
  - *Steve*
- Aleutian Islands risk assessment team – summary of the final report (esp traffic, oil spills). Includes recommendations for risk reduction. Are there any spatial implications that are relevant to pull out? (Mostly eastern ecoregion).
  - *Libby*
- Changes in processing plants in the AI
  - *Dave Fraser/Diana E*

Future hot topics:
- coral research results
- oil spills
- other recommendations on clean up (whether dispersants should be used, etc.) – under discussion right now

Assignments
- For each indicator
  - data
  - Description of indicator, how it was calculated
  - Justification/ relevance for management

Deadlines

October 7: data to Stephani
October 19: review of chapter back to Stephani