



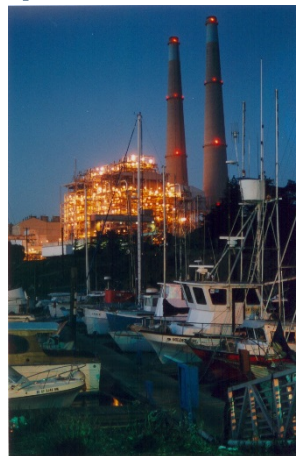
The California Current IEA: Human Dimensions (HD) Indicators Webinar

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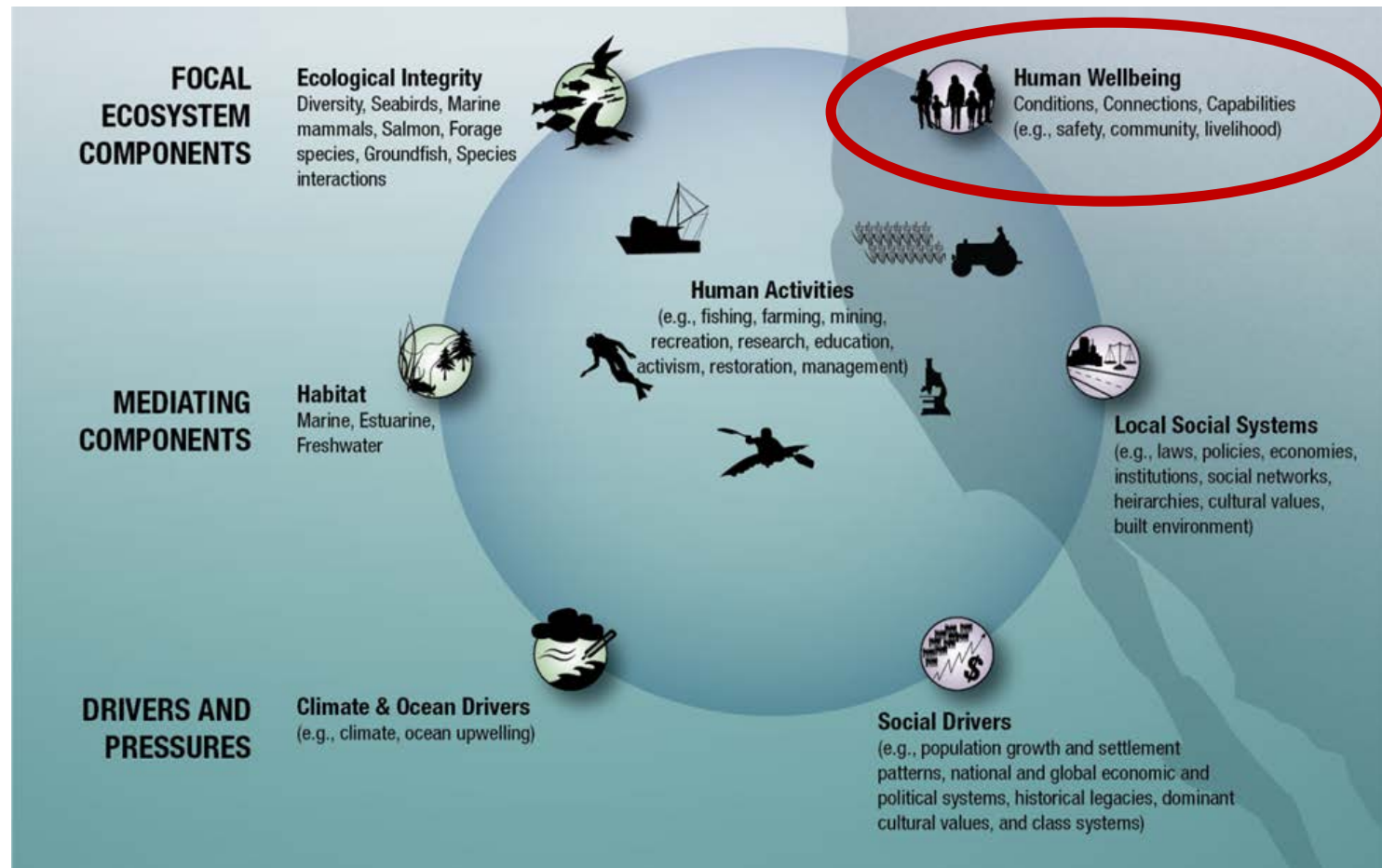
1. NOAA Fisheries, Northwest Fisheries Science Center
2. NOAA Fisheries, Southwest Fisheries Science Center
3. University of Washington
4. Washington Sea Grant
5. NOAA Fisheries, Alaska Fisheries Science Center
6. University of California-Santa Clara
7. Pacific States Marine Fisheries Commission
8. Colorado State University
9. NOAA Fisheries, OST

Why develop Human Dimensions (HD) indicators in the CCIEA?

- HD part of the vision for a comprehensive IEA
- Questions about the desired state of the system always societal questions
- An ecosystem assessment for a large marine ecosystem adjacent to a populous coastline ***necessitates*** HD analyses



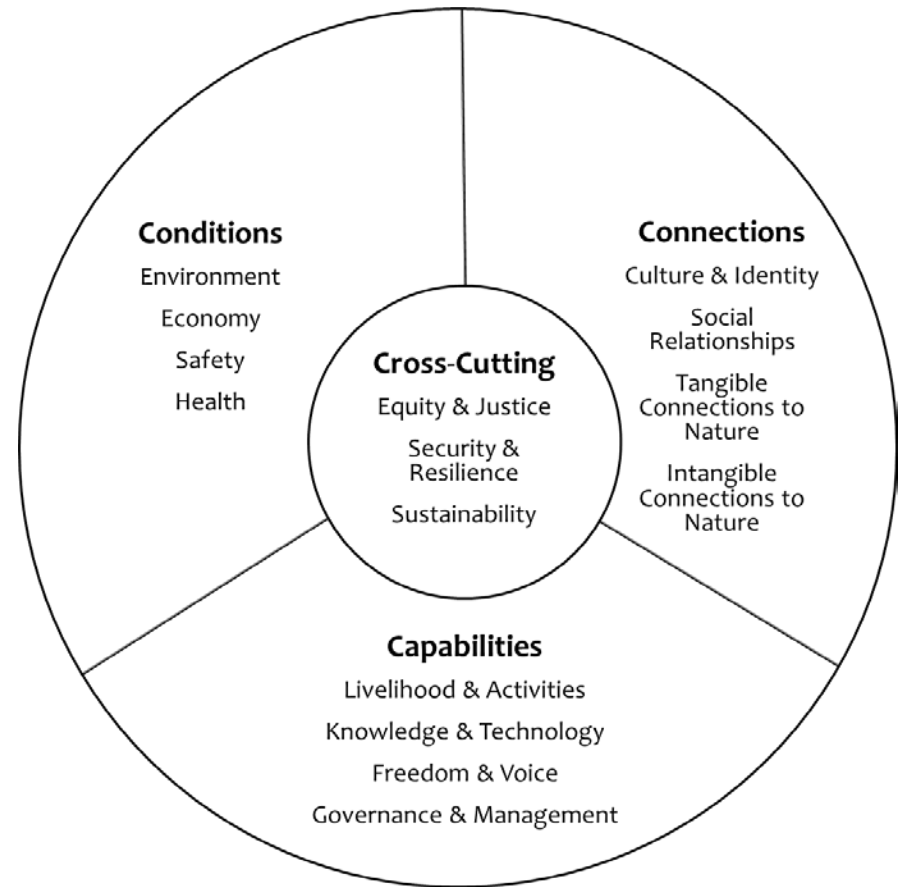
The California Current (CC) as Socio-Ecological System (SES)



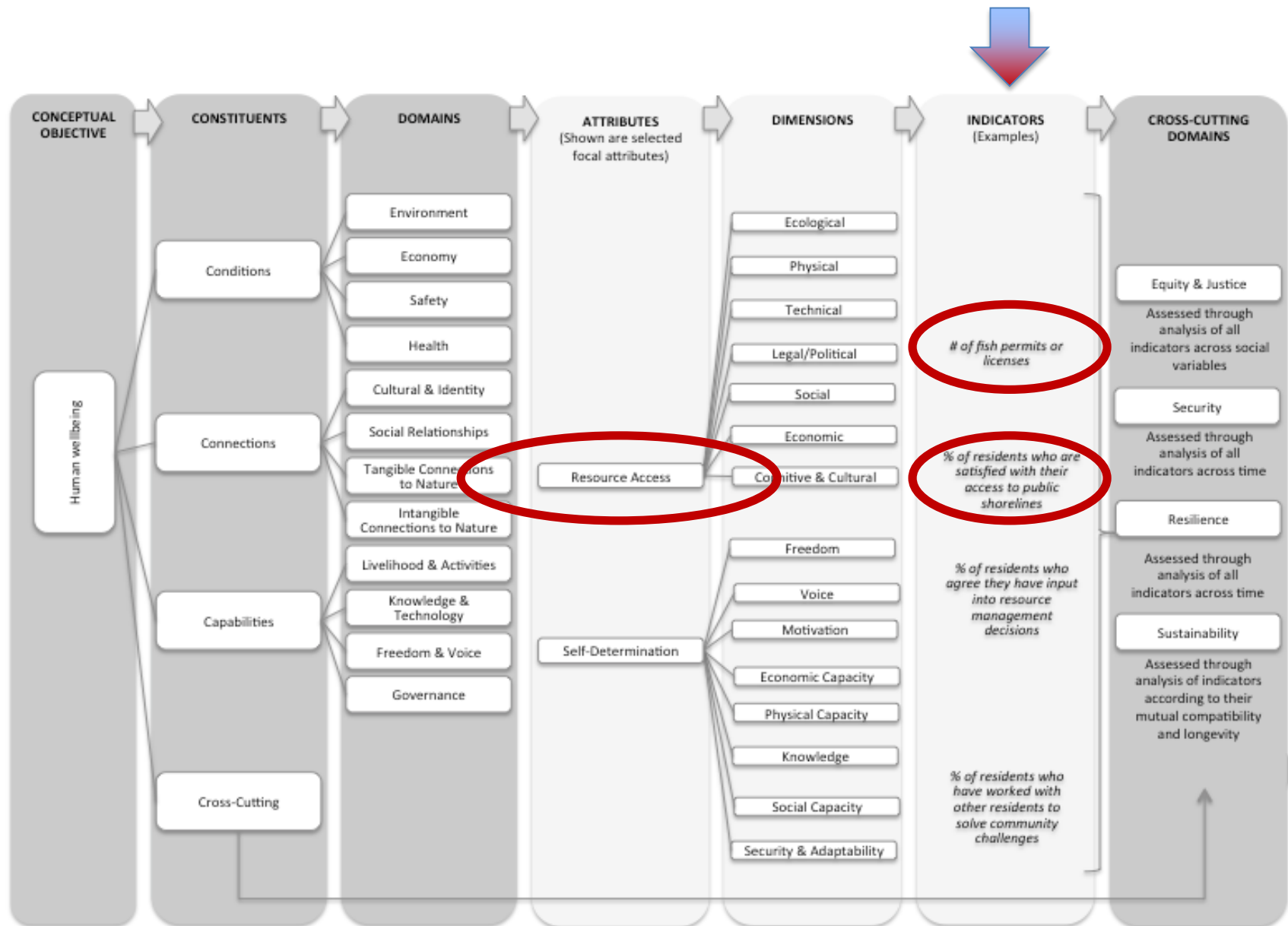
Social Wellbeing Indicators for Marine Management (SWIMM) Working Group

Working Group

- Arun Agrawal, U Michigan
- Xavier Basurto, Duke U
- Sara Breslow, U Washington
- Courtney Carothers, U Alaska
- Susan Charnley, USFS, Portland
- Sarah Coulthard, Northumbria U
- Jamie Donatuto, Swinomish Tribe
- Nives Dolsak, UW
- Carlos Garcia-Quijano, U Rhode Isl.
- Christina Hicks, Lancaster U
- Phil Levin, NOAA
- Arielle Levine, San Diego State U
- Michael Mascia, Conservation Intl
- Karma Norman, NOAA
- Melissa Poe, NOAA/WSG
- Terre Satterfield, U British Columbia
- Kevin St. Martin, Rutgers U



SWIMM Approach to Selecting HD Indicators



Environment	Resource Abundance & Distr. Environmental Quality Infrastructure Pollution & Waste
Economy	Industry & Commerce Employment & Income Informal Economies Material Wealth
Safety	Peace & Security Disaster Preparedness Physical Safety
Health	Emotional & Mental Health Food Physical Health
Culture & Identity	Heritage Cultural Values & Practices Identity
Social Relationships	Family & Community Social Diversity & Integrity Civil Society

Tangible Connections to Nature	Resource Access Access to Nature Stewardship
Intangible Connections to Nature	Beauty & Inspiration Sense of Place Spirituality
Livelihood & Activities	Job Quality Time for Fulfilling Activities Recreation & Tourism Subsistence
Knowledge & Technology	Education & Information Research & Technology
Freedom & Voice	Independence & Self-Determination Political Participation Sovereignty
Government & Management	Governance Resource Management Public Services
Cross-Cutting	Equity & Justice Security & Resilience Sustainability

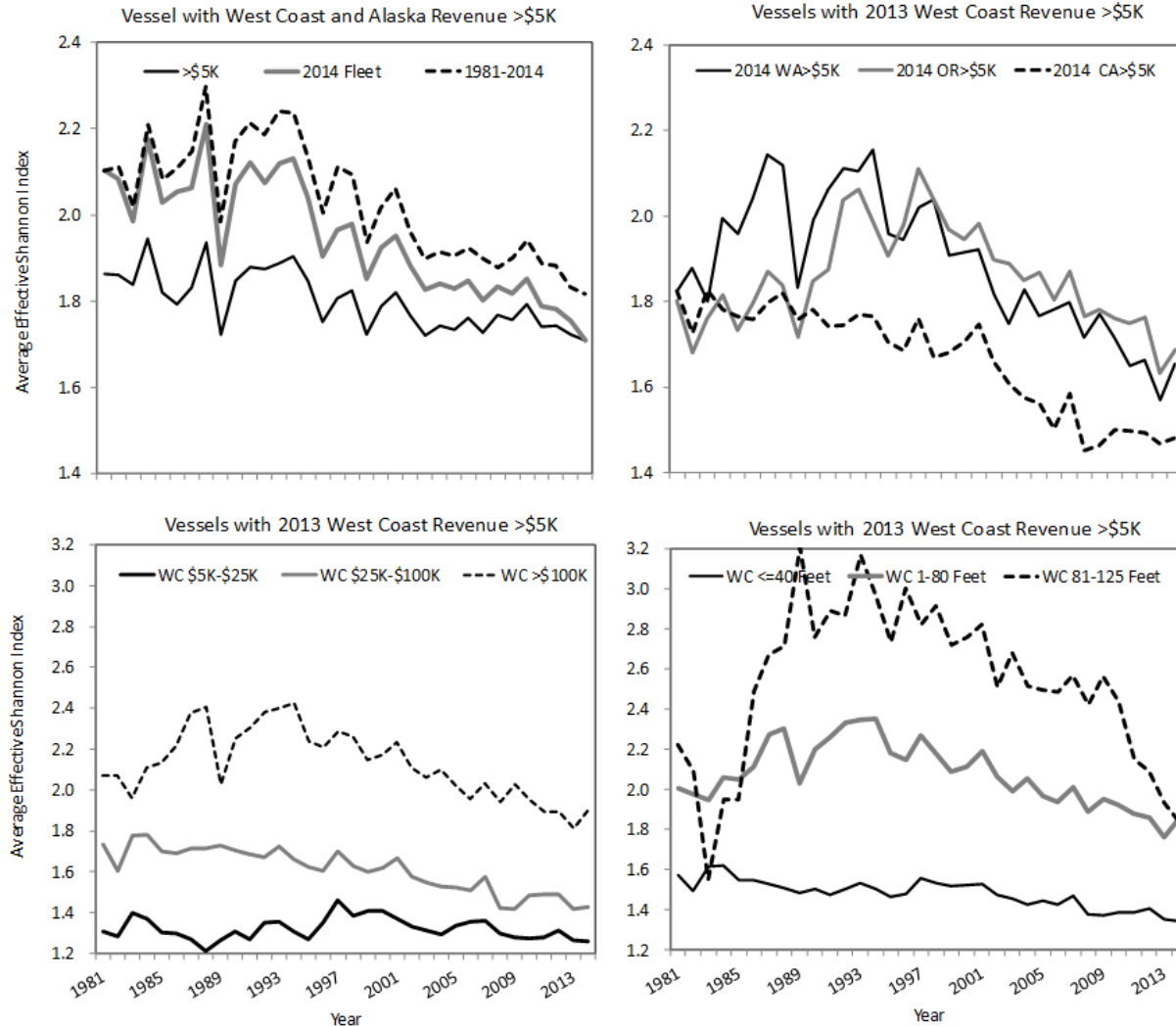
Fishing Diversification Indicator

- Why important? Diversification of revenue (for vessels or ports) reduces year-to-year income variation, so provides an indicator on the resilience of vessels and connects the diversity of available species to the wellbeing of fishermen/communities
- As a measure of diversification we utilize the effective Shannon index (ESI). The ESI increases both as revenues are spread across more fisheries and as revenues are spread more evenly across fisheries.
- Data: Uses vessel-level fish ticket data on landings and revenue by species and port (including data for Alaska as well as West Coast landings) for over 28,000 vessels

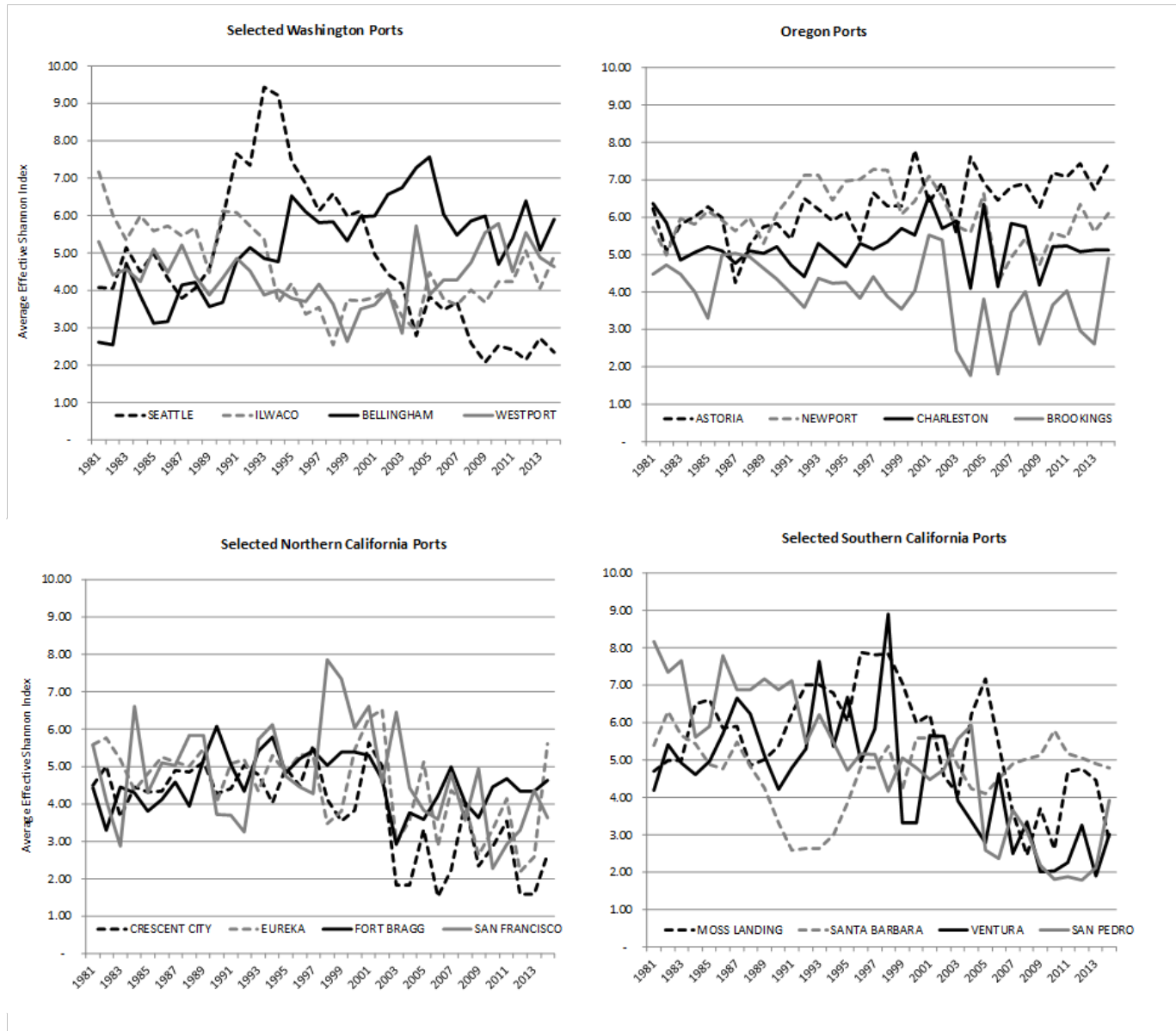
Kasperski, S. and D.S. Holland 2013. **Income Diversification and Risk for Fishermen**. *Proceedings of the National Academy of Science*. 100(6):2076-2081. doi: 10.1073/pnas.1212278110



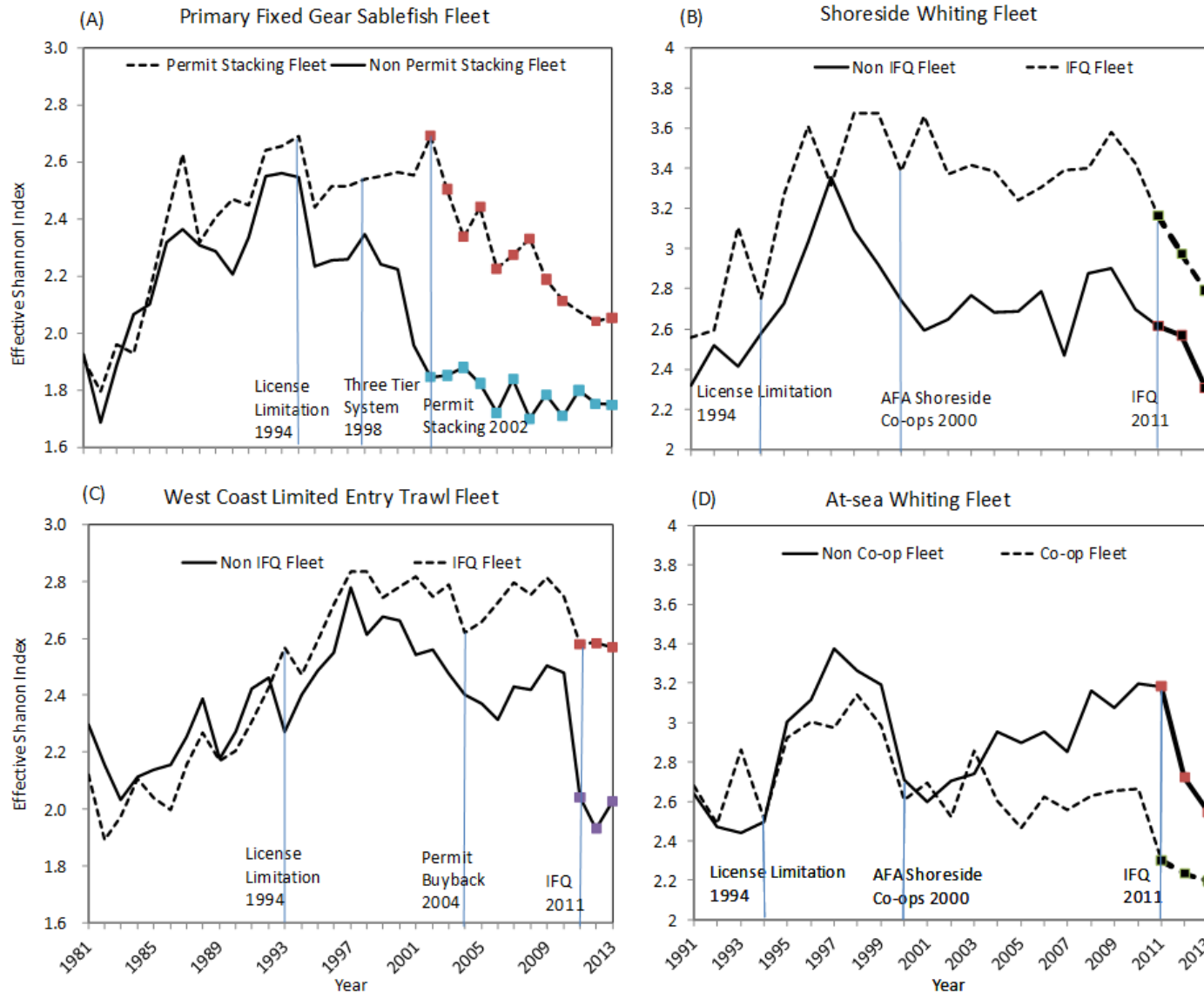
Trends in Avg. Diversification for West Coast and AK Fishing Vessels with over \$5K in Avg. Revenues



Trends in Diversification for Major West Coast Ports



Diversification and Catch Shares Case Studies



“Personal Use” Indicator

- Makes creative use of fishticket ‘removal type’ for landings
- Provides indicator of the importance of the ecosystem and its species for non-commercial/social purposes (e.g., food)



Poe, Melissa R., Phillip S. Levin, Nick Tolimieri, and Karma Norman. "Subsistence fishing in a 21st century capitalist society: From commodity to gift." *Ecological Economics* 116 (2015): 241-250.



“Personal Use” Indicator

- What is Personal Use?
- “Removal Type” recorded on PacFIN data, counts toward total catch

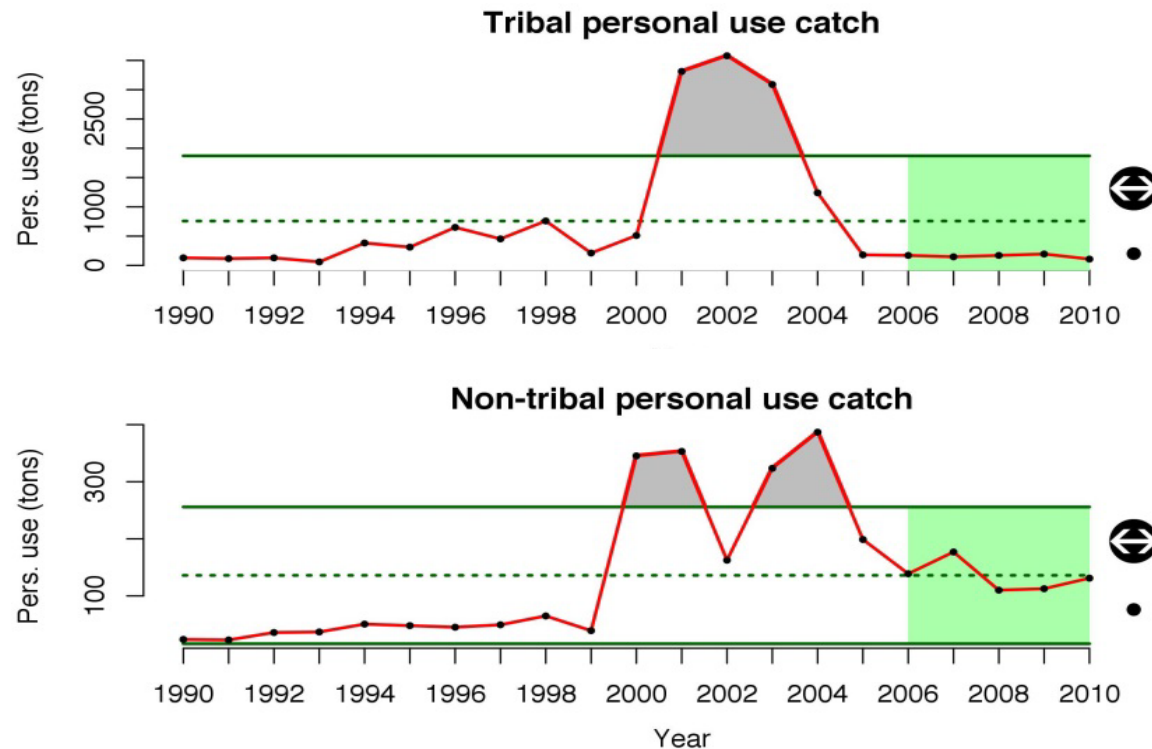
12 DEC 2014 13:01
User: PACFIN

PacFIN Report list_cl_removal_type PacFIN Removal Type Codes

Code List Name	Code	Description
REMOVAL-TYPE	.	synonym for NULL
	C	Commercial (non-EFP)
	D	Commercial(Direct Sales)
	E	Exempted Fishing Permit(EFP). Fishers fishing with this permit are required to retain all rockfish.
	O	Other
	P	Personal Use
	R	Research
	U	Unknown

'Personal Use' HD Indicator

Commercial Operators in WA & CA, 1990-2010



Note: axes are uneven in magnitude of catch by volume

Figure. Green horizontal lines show the mean (dotted) and ± 1.0 s.d. (solid line). Shaded green area is the last 5 years of the time series, which is analyzed to produce the symbols to the right of the plot. The upper symbol indicates whether the modeled trend over the last 5-years increased ($\nearrow$), or decreased ($\searrow$) by more than 1.0 s.d., or was within one 1.0 s.d. ($\leftrightarrow$) of the long-term trend. The lower symbol indicates whether the mean of the last 5 years was greater than (+), less than (-), or within ($\cdot$) one s.d. of the long-term mean.

Spatial Variation of Personal Use

Top 5 **Washington** Ports with highest **gross volume** of Personal Use

Bellingham Bay – 737,219 lbs.

Ilwaco – 499,324 lbs.

Westport – 363,616 lbs.

Seattle – 192,403 lbs.

Chinook – 61,226 lbs.

Top 5 **Washington** Ports with highest **percentage** of Personal Use (as % of total landings per port):

Brinnon -- 33.18%

Shelton -- 23.95%

The Dalles -- 14.3%

Tacoma -- 6.03%

Olympia -- 5.44%

Top 5 **Washington** Ports with highest **percentage** of Personal Use landings (*excluding tribal*):

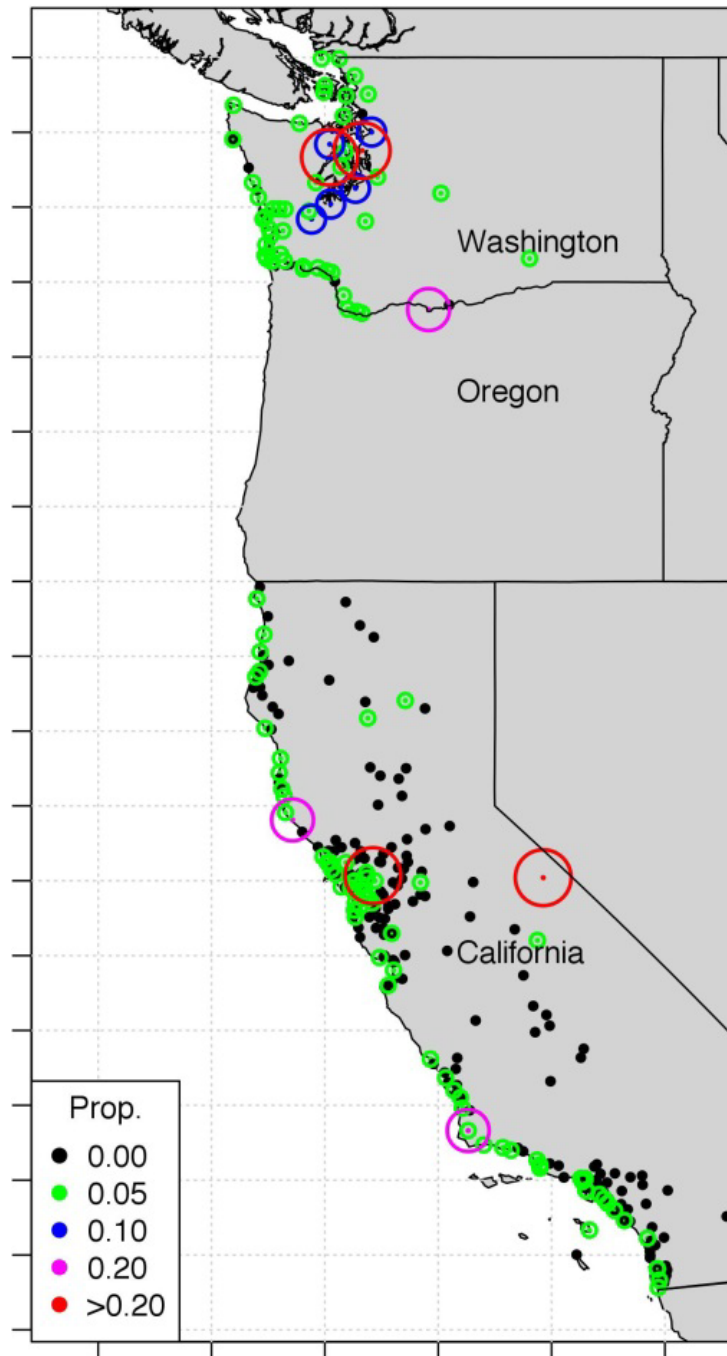
Deer Harbor – 3.03%

Ridgefield – 1.84%

Raymond – 1.69%

Grayland -- .51%

Whidbey Island -- .47%



Spatial Variation of Personal Use

Top 5 **California** Ports with highest **gross volume** of Personal Use landings

Port Hueneme – 962,621 lbs.

Mono Lake – 400,679 lbs.

Moss Landing – 379,342 lbs.

Ventura – 275,792 lbs.

Crescent City – 155,582 lbs

Top 5 **California** Ports with highest **percentage** of Personal Use landings:

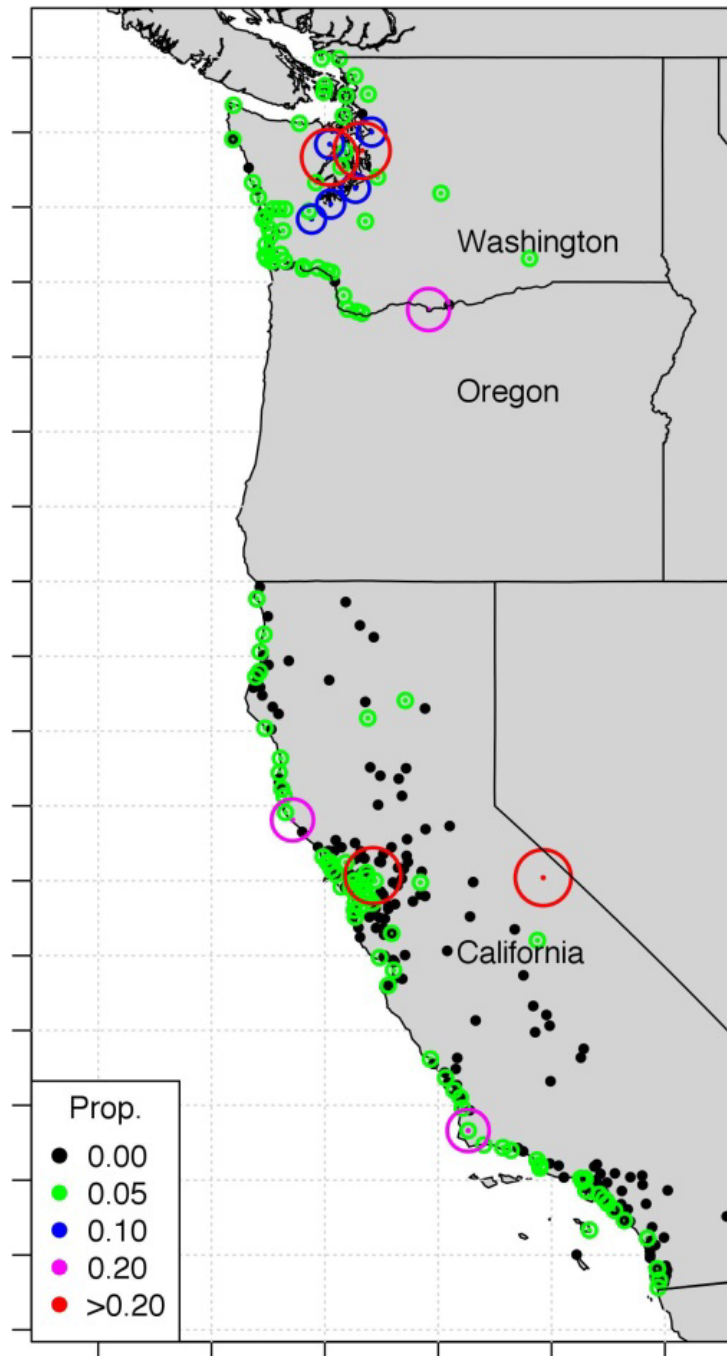
Mono Lake – 26.64%

Benicia – 22.9%

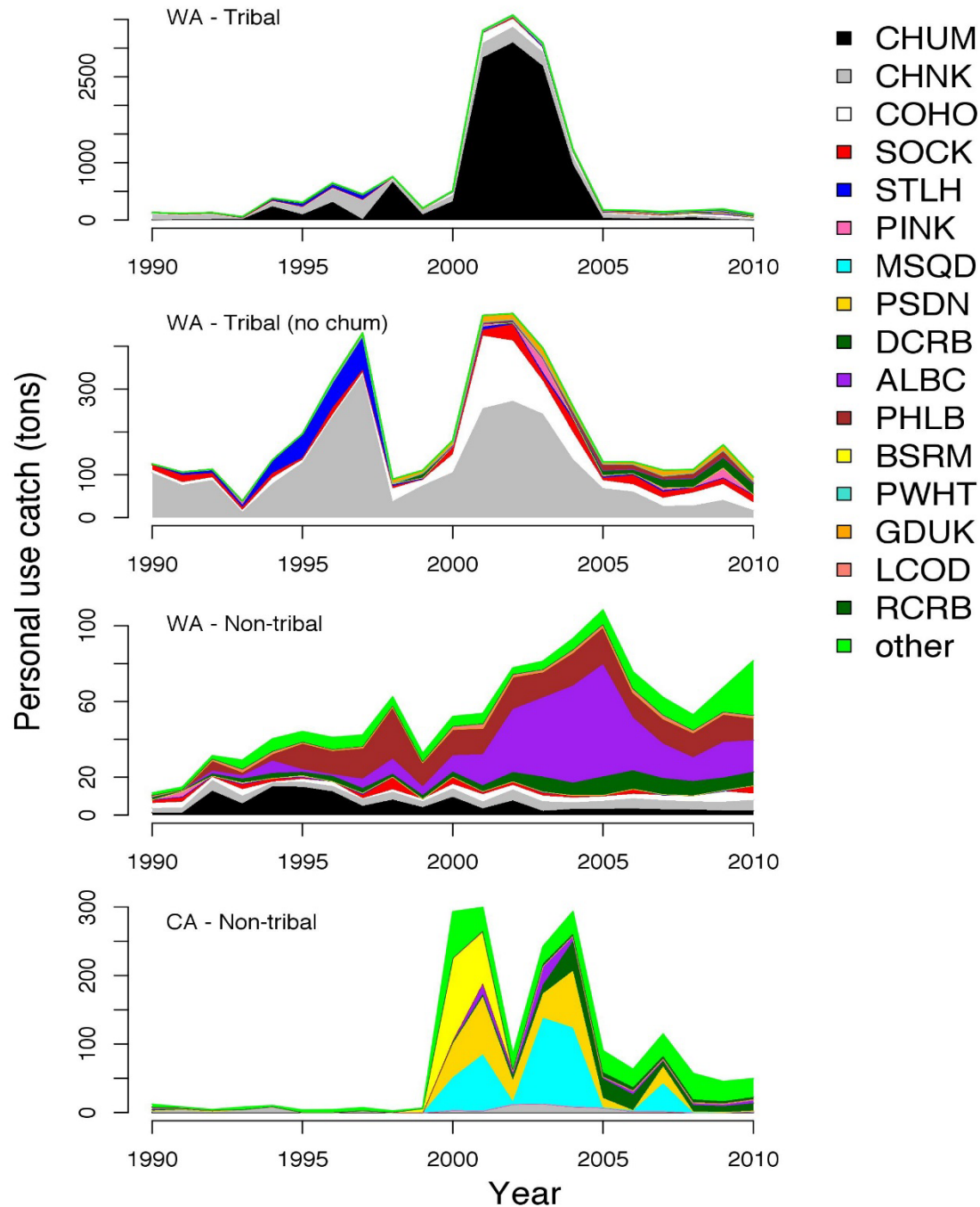
Lompoc – 18.08%

Anchor Bay – 11.58 %

Moonstone Beach – 4.14 %



Annual Personal Use catch by species in tons



Community Social Vulnerability Indices (CSVI): Objectives

- Construct indices – through secondary data – as measures of community vulnerability
- Use indices to track community and ecosystem changes over time
- Test an established methodology in a new socio-ecological context



To cite this article: Lisa L. Colburn & Michael Jepson (2012): Social Indicators of Gentrification Pressure in Fishing Communities: A Context for Social Impact Assessment, Coastal Management, 40:3, 289-300

To link to this article: <http://dx.doi.org/10.1080/08920753.2012.677635>



How to Cite

Jepson, M. (2007), Social Indicators and Measurements of Vulnerability for Gulf Coast Fishing Communities. NAPA Bulletin, 28: 57–68. doi: 10.1525/napa.2007.28.1.57

CSV Data Sources

Federal agency data

- US Census/American Community Survey (ACS)
- Bureau of Labor Statistics
- County level crime statistics

State agency data

- Washington Department of Fish and Wildlife
- Oregon Department of Fish and Wildlife
- California Department of Fish and Wildlife

through...

- Pacific Fishery Information Network (PacFIN),
- Environmental Systems Research Institute (ESRI)



CSVI: Factor Analysis Approach

Social Vulnerability Indices:

- *Personal disruption +*
- *Population composition +*
- *Poverty +*
- *Labor force structure +*
- *Housing characteristics +*
- *Natural resource +*
- *Wealth and education*

= Social vulnerability indices
composite score

Fishing Indices:

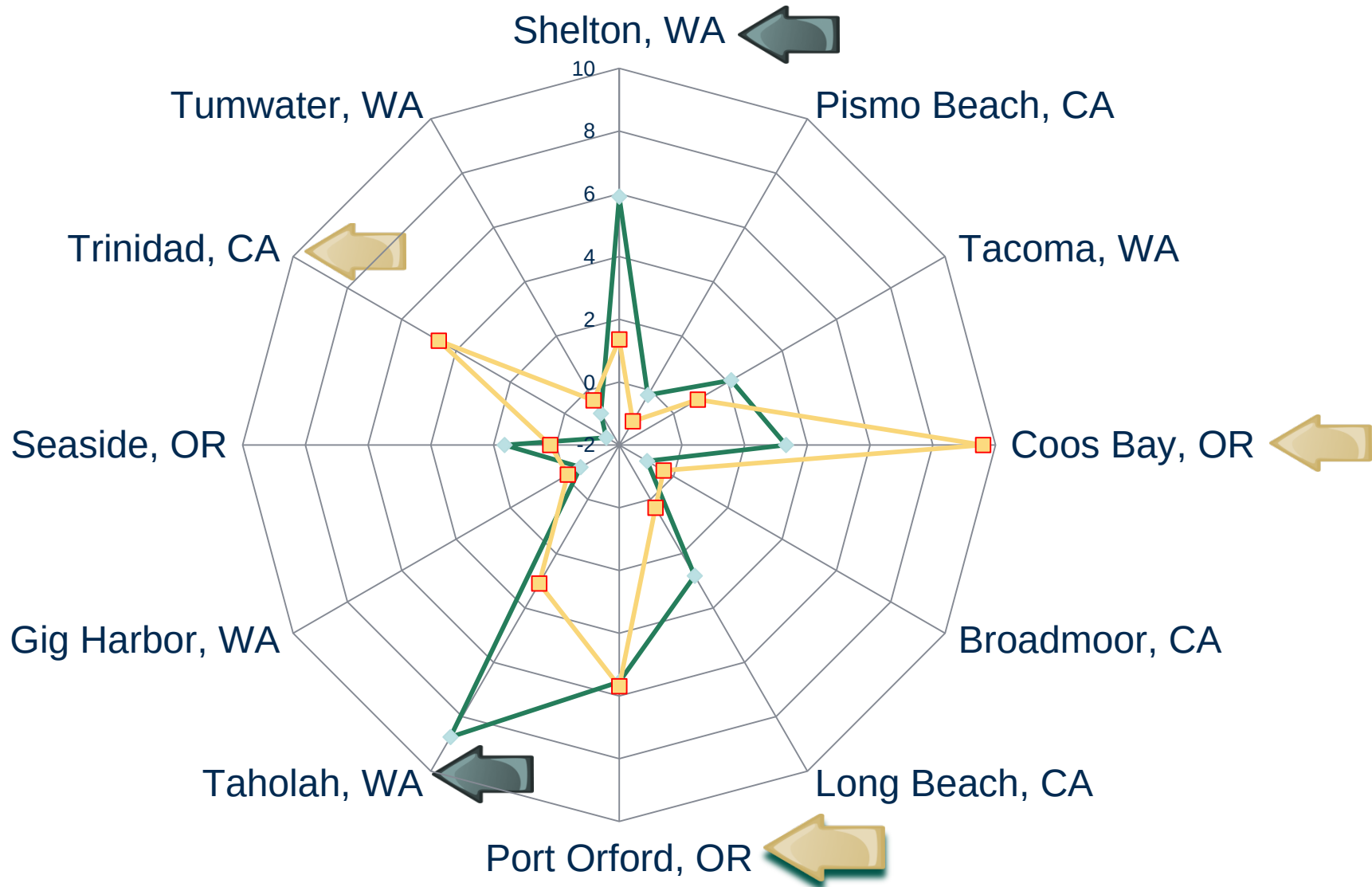
- *Commercial fishing reliance +*
- *Commercial fishing engagement*

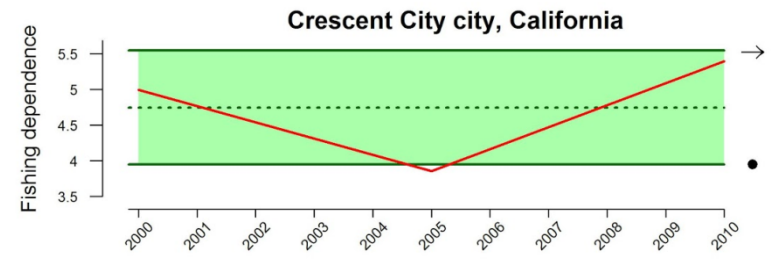
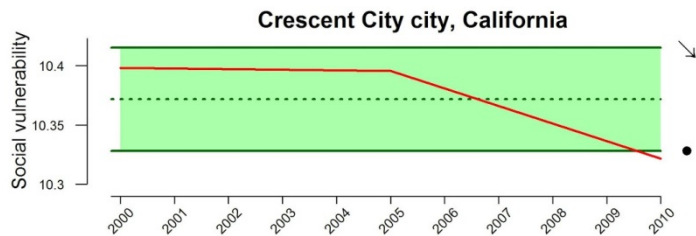
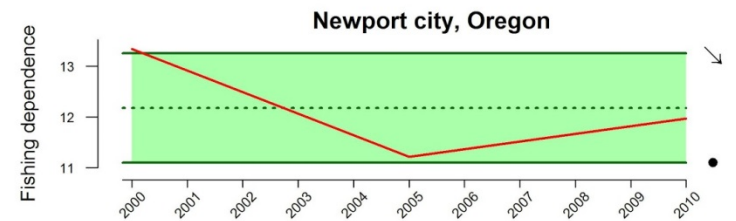
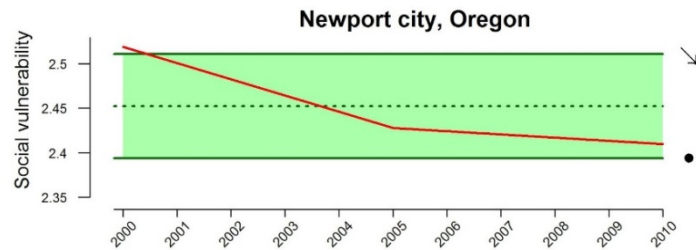
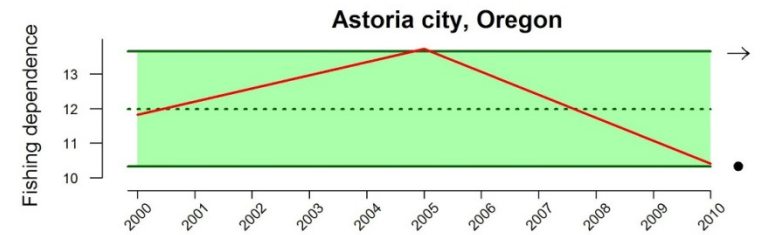
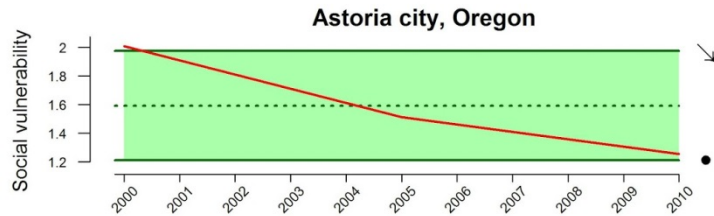


= Fishing dependence indices
composite score

—◆— Social Vulnerability Composite

—□— Fishing Dependence Composite





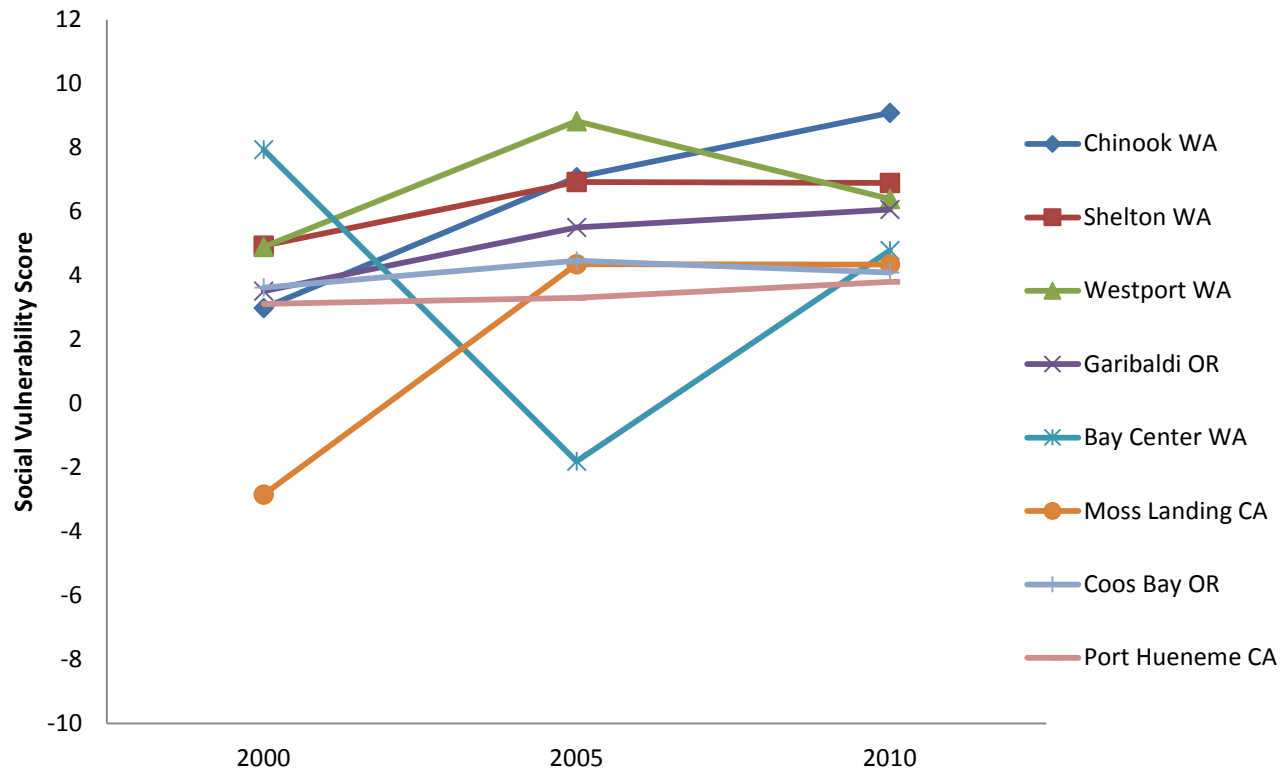
Social Vulnerability Composite

Community	Score for 2010
Neah Bay, Washington	10.79
Crescent City, California	10.32
Taholah, Washington	8.75
Chinook, Washington	7.50
Siletz, Oregon	6.47
Shelton, Washington	5.91
Tillamook, Oregon	5.82
Port Orford, Oregon	5.55
Westport, Washington	5.35
Garibaldi, Oregon	5.33
Winchester Bay, Oregon	4.81
Point Arena, California	4.79
Fort Bragg, California	4.47
Oxnard, California	4.20

Fishing Dependence Composite

Community	Score for 2010
Moss Landing, California	25.44
Westport, Washington	19.19
Los Angeles, California	12.36
Newport, Oregon	11.97
Astoria, Oregon	10.41
Coos Bay, Oregon	9.60
Tokeland, Washington	8.45
Ilwaco, Washington	8.33
Bodega Bay, California	8.08
Garibaldi, Oregon	7.11
Winchester Bay, Oregon	6.64
Port Orford, Oregon	5.69
El Granada, California	5.54
Ventura, California	5.45

Social Vulnerability Scores of Top Commercial Fishing-Dependent Communities



CSVl: three birds with one stone

- Part of a longstanding interest in community-level analyses within NMFS and PFMC (NS 8)
- Partially satisfies the HD indicators needs of the CCIEA
- Part of cohesive national social science effort:

<http://www.st.nmfs.noaa.gov/humandimensions/social-indicators/map>

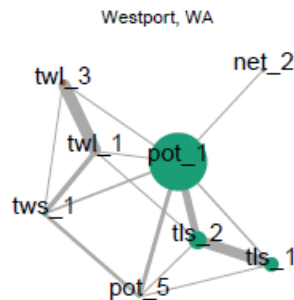
Ongoing and Future HD Development:

Climate Change, Social Vulnerability, Exposure and Risk

Social vulnerability indices and composite scores provide some measure of community *vulnerability*

Community	Social Vulnerability Composite	Individual Rank
Westport, WA	5.35	81 of 880

Fishing-specific analyses provide some measure of *exposure*



Community	Fishing Dependence Composite	Individual Rank
Westport, WA	19.19	2 of 880

Combined analyses will aid in assessing climate change risks for coastal communities

Ongoing and Future HD Development

- 1. West Coast fisheries and fishing communities: a coupled natural-human system (NWFSC and WA Sea Grant)***
- 2. Coastal community vulnerability to ocean acidification risk analysis (NWFSC and WA Sea Grant)***
- 3. Ocean recreational expenditures survey (NOAA S&T and SWFSC)***
- 4. Water supply effects on labor demand and agricultural production in the San Joaquin Valley (SWFSC)***





Discussion