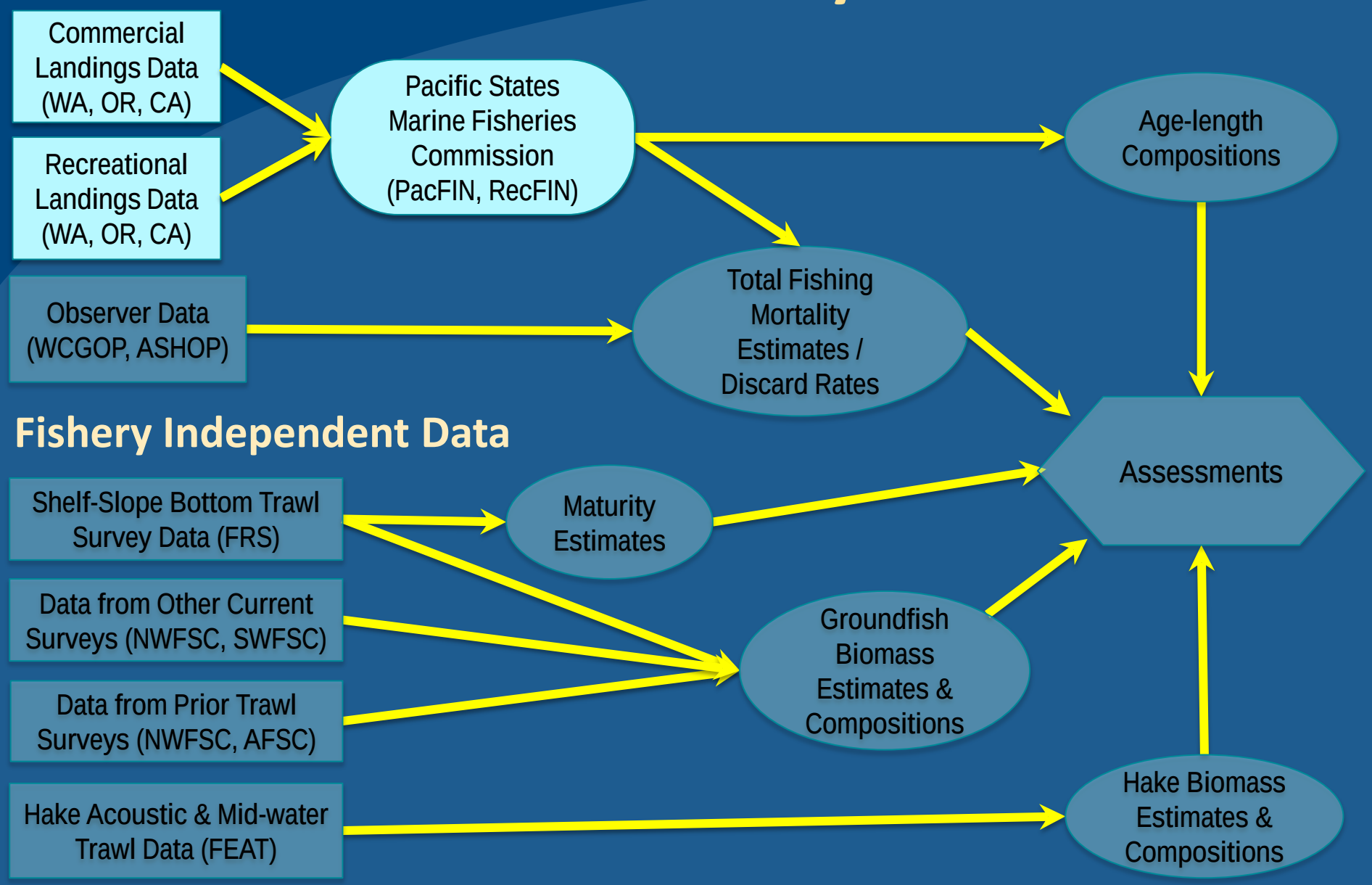
Fishery-Dependent Groundfish Data Collection & Processing in Oregon

Maggie Sommer
Oregon Department of Fish & Wildlife
Marine Resources Program

Seattle, WA
September, 2013

Fishery Data Flows



Outline

1. Quick review - what are “fishery-dependent” data, and how are they used in assessments?
2. Orientation to Oregon
3. Data collection
4. Quality control
5. Data flow and access
6. Strengths, challenges, and solutions

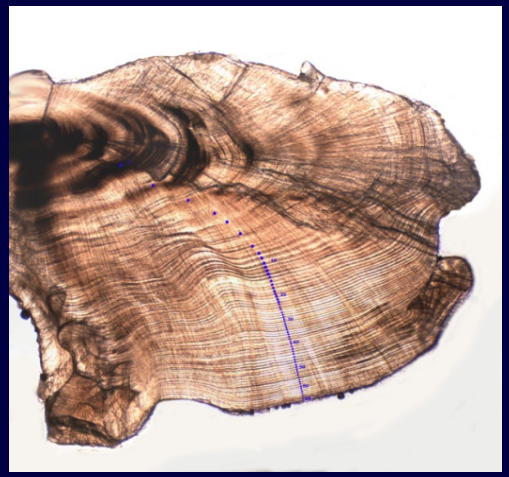
What are "fishery-dependent" data?

Data collected from commercial or recreational fishing activities:

I. Information on **catch**
   - Landings and discards
   - Location
   - Biological data: age, length, weight, maturity

removals

population characteristics



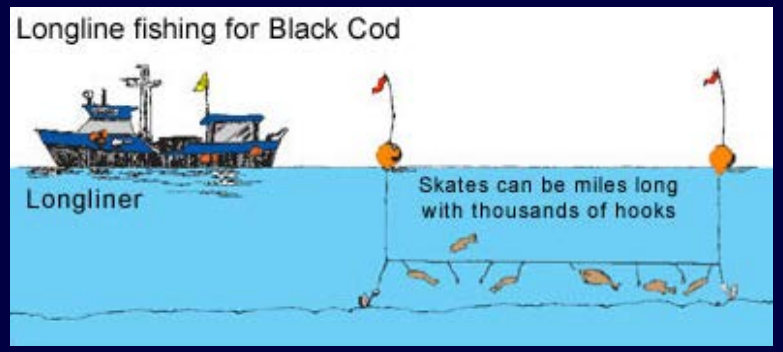
What are "fishery-dependent" data?

Data collected from commercial or recreational fishing activities:

II. Information on **effort**

- How much (e.g., tow duration, # hooks, # anglers, etc.)

Catch-Per-Unit-Effort (CPUE) used to estimate recreational removals, and in abundance indices.



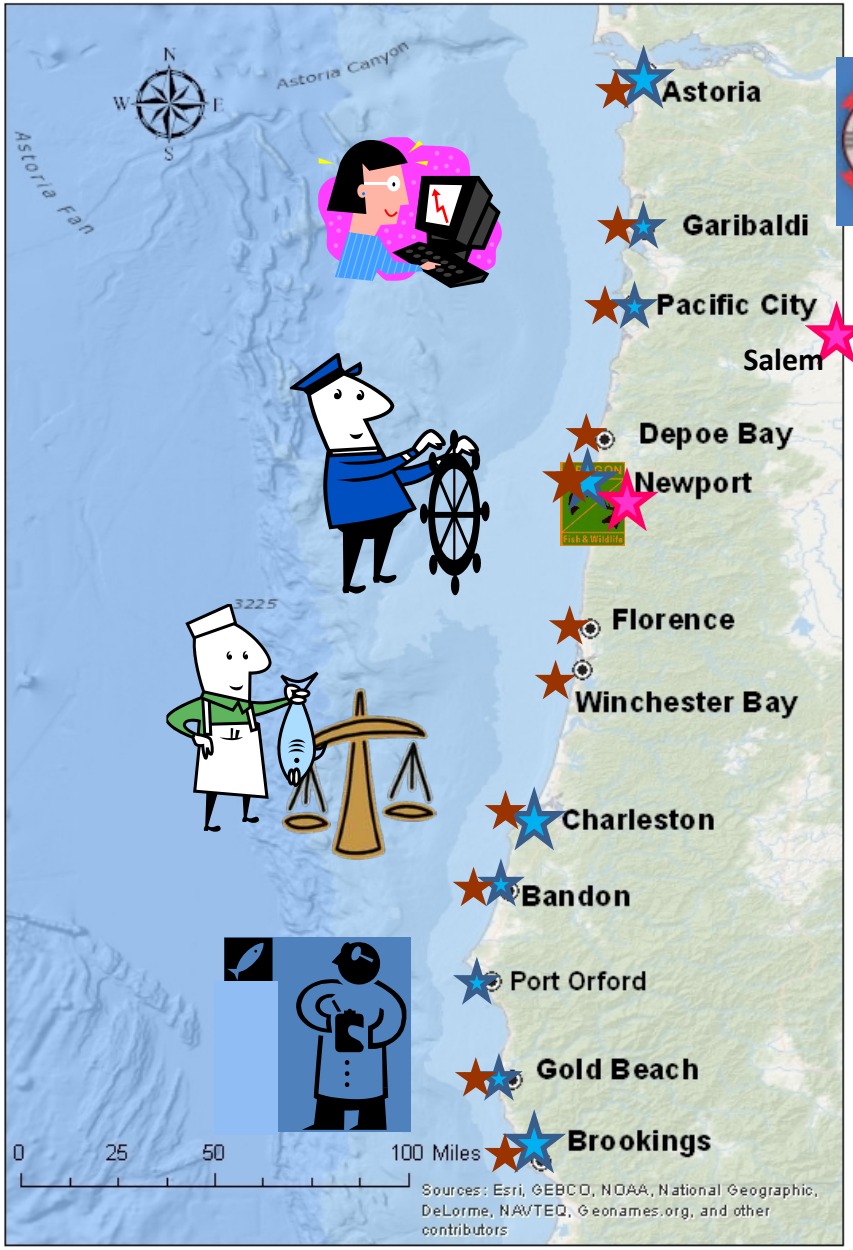
III. Information on **fishing fleet**

- Gear types
- Target species

CPUE

Orientation to Oregon

- ODFW Marine Resources Program HQ - Newport
- Commercial port sampling
  - 4 permanent field offices
  - Day trips to other ports
- Recreational port sampling
- Vessel captains
- Fish buyers/processors
- Data techs/analysts
- PSMFC (PacFIN & RecFIN)



Seattle, Portland

Sources of fishery-dependent data used in assessments

Oregon sources:

- Commercial:
  - Fish tickets
  - Species composition samples
  - Biological samples
  - Logbooks
- Recreational:
  - Recreational survey
  - Onboard charter observing project

removals

population characteristics

CPUE

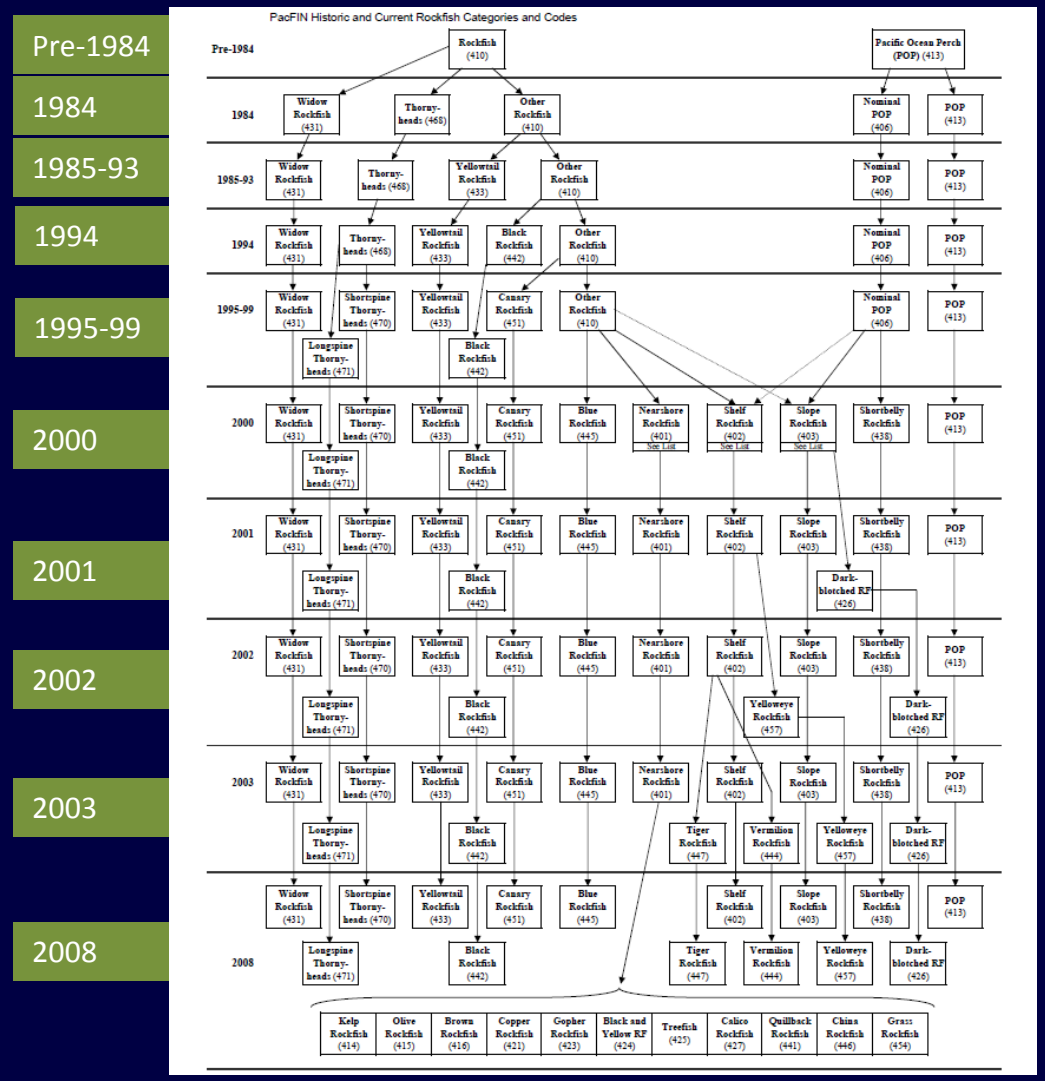
location

Commercial Landings Data – Market Categories

Market Categories

- All commercial fish buyers must sort landings to ***market category***
- May be multi-species or single-species
- Originally based on market value, now also on management need for more species-specific data

Evolution of market categories in Oregon, 1994-present

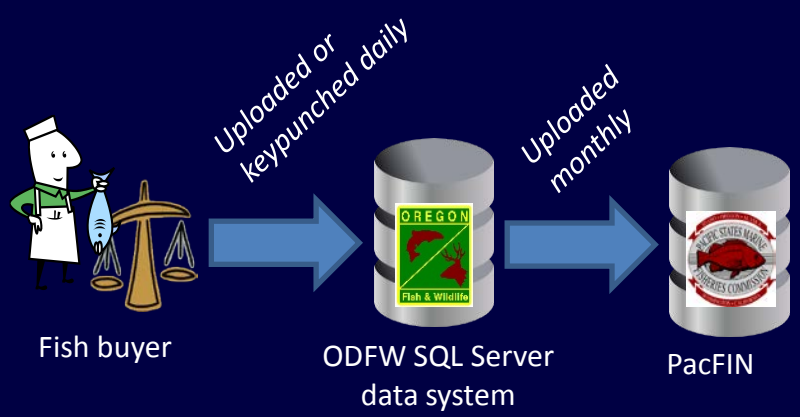


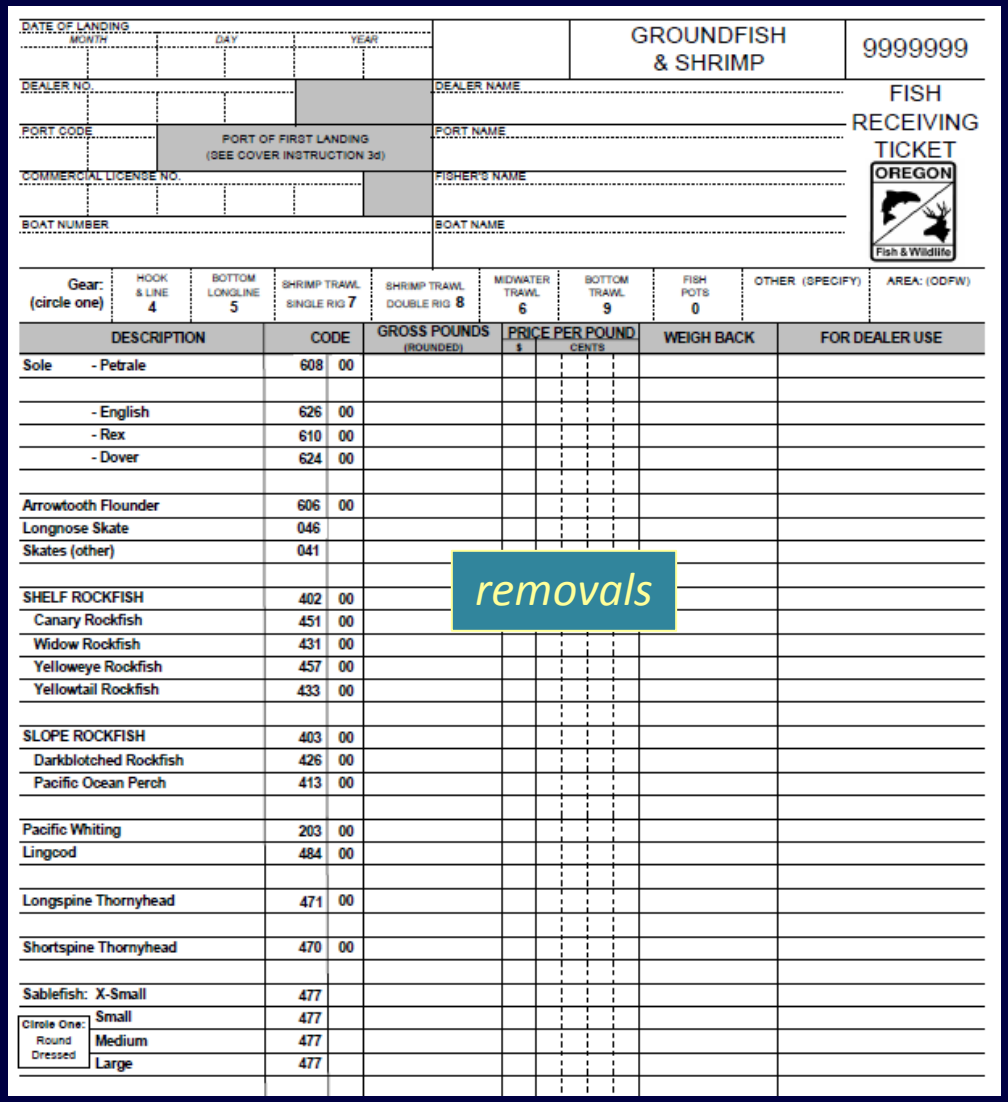
Data Collection - Fish Tickets (Fish Landing Receipts)

- Commercial landings

  All commercial fish buyers must report on a fish ticket:

  - Weight by market category
  - Gear (one per ticket)
  - Condition (live, dressed, etc.)
  - Location of catch
    - Default area by port; corrected with logbooks
  - Other info not used in stock assessment (price, etc.)





DATE OF LANDING: MONTH | DAY | YEAR

GROUNDFISH & SHRIMP

9999999

FISH RECEIVING TICKET

OREGON Fish & Wildlife

DEALER NO. | DEALER NAME

PORT CODE | PORT OF FIRST LANDING (SEE COVER INSTRUCTION 3d) | PORT NAME

COMMERCIAL LICENSE NO. | FISHER'S NAME

BOAT NUMBER | BOAT NAME

Gear: (circle one)	HOOK & LINE 4	BOTTOM LONGLINE 5	SHRIMP TRAWL SINGLE RIG 7	SHRIMP TRAWL DOUBLE RIG 8	MIDWATER TRAWL 6	BOTTOM TRAWL 9	FISH POTS 0	OTHER (SPECIFY)	AREA: (ODFW)

DESCRIPTION	CODE		GROSS POUNDS (ROUNDED)	PRICE PER POUND $	CENTS	WEIGH BACK	FOR DEALER USE
Sole - Petrale	608	00					
- English	626	00					
- Rex	610	00					
- Dover	624	00					
Arrowtooth Flounder	606	00					
Longnose Skate	046						
Skates (other)	041						
SHELF ROCKFISH	402	00					
Canary Rockfish	451	00					
Widow Rockfish	431	00					
Yelloweye Rockfish	457	00					
Yellowtail Rockfish	433	00					
SLOPE ROCKFISH	403	00					
Darkblotched Rockfish	426	00					
Pacific Ocean Perch	413	00					
Pacific Whiting	203	00					
Lingcod	484	00					
Longspine Thornyhead	471	00					
Shortspine Thornyhead	470	00					
Sablefish: X-Small	477						
Circle One: Round Dressed — Small	477						
Medium	477						
Large	477						

removals

Data Collection - Commercial Species Compositions

Purpose: convert landings of each market category on fish tickets to species-specific estimates of landed weight

- Sampling goal: represent landings
  - Opportunistic & adaptive sampling
- After catch is sorted, 2 baskets of ~25 or 50 lbs each (or 2 x 15 fish) are randomly selected
- Proportion of each species in market category determined (by weight)

Data Processing - Commercial Species Compositions

- Species composition data are stratified by:
  - Market category
  - Port
  - Quarter
  - Gear
  - PMFC area
  - Condition

- Proportions are sent to PacFIN monthly, where they are applied to fish ticket data
- When no sample data exist, data from another stratum are borrowed, or the ticket data remain "nominal"
- Flaws with current borrowing system:
  - No minimum number of samples required to calculate a species composition proportion (i.e., 1 unusual sample can skew results)
  - Major differences between ports in species landed due to buyers, gears

Species Composition Sampling Coverage

Landings actually sampled

Borrowing required

Selected market categories

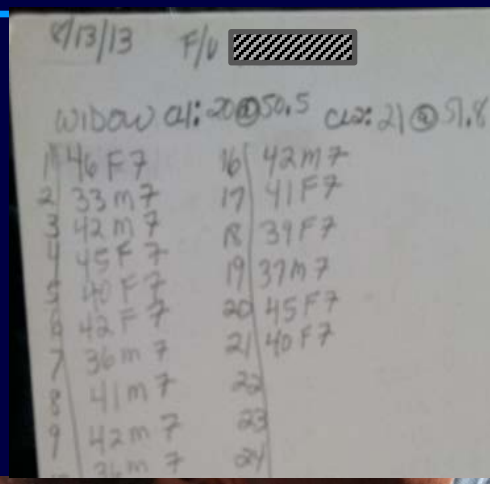
"Market" Landing category (PacFIN code)	2002-2011 landed mt	Percent of category landed weight in landings sampled for species composition										Percent of landed weight in sampling strata without species composition sample data									
		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
BLK1 (NOM. BLACK RF)	1,099	3%	4%	6%	4%	10%	10%	8%	7%	10%	11%	34%	31%	39%	37%	18%	8%	9%	8%	14%	10%
BLU1 (NOM. BLUE RF)	34	6%	7%	4%	4%	4%	11%	4%	8%	12%	9%	74%	51%	25%	92%	86%	49%	50%	22%	22%	9%
CNR1 (NOM. CANARY RF)	51	18%	13%	15%	15%	5%	1%	12%	32%	16%	25%	53%	60%	49%	63%	93%	98%	74%	4%	58%	12%
DBR1 (NOM. DARKBLOTCHED RF)	887	22%	22%	33%	33%	25%	30%	30%	25%	25%	35%	37%	18%	12%	14%	18%	14%	7%	13%	7%	5%
KGL1 (NOM. KELP GREENLING)	232	7%	8%	10%	7%	12%	10%	7%	6%	10%	11%										
LSP1 (NOM. LONGSPINE THORNYHEAD)	4,805	14%	16%	24%	22%	29%	30%	25%	21%	23%	33%	19%	24%	35%	30%	13%	18%	8%	13%	6%	16%
NUSF (NOR. UNSP. SHELF RF)	73	19%	8%	15%	22%	17%	5%	38%	34%	34%	19%	50%	40%	46%	51%	32%	84%	27%	15%	18%	26%
NUSP (NOR. UNSP. SLOPE RF)	1,054	17%	17%	33%	26%	28%	34%	36%	31%	21%	29%	21%	8%	17%	18%	19%	11%	5%	12%	11%	5%
NUSR (NOR. UNSP. NEAR-SHORE RF)	72	9%	11%	14%	6%	11%	13%					7%	7%	6%	18%	11%	3%				
POP2 (NOM. POP)	703	15%	16%	18%	31%	38%	28%	21%	21%	23%	34%	36%	16%	12%	13%	12%	28%	3%	18%	2%	12%
SSP1 (NOM. SHORTSPINE THORNYHEAD)	4,985	11%	11%	14%	12%	16%	23%	21%	15%	16%	18%	29%	26%	23%	14%	15%	10%	4%	11%	8%	13%
STRY (STARRY FLOUNDER)	203		0%	0%	4%		44%	17%	6%	2%											
VRM1 (NOM. VERMILLION RF)	23		7%	10%	8%	4%	7%	2%	7%	14%	16%		13%	8%	37%	40%	28%	50%	9%	22%	16%
WDW1 (NOM. WIDOW RF)	527	51%		2%	0%	3%	1%	51%	20%	34%	25%	9%	99%	98%	99%	91%	98%	19%	28%	9%	41%
YTR1 (NOM. YELLOWTAIL RF)	1,476	24%	16%	12%	4%	2%	2%	15%	19%	22%	12%	49%	50%	41%	80%	81%	87%	65%	9%	6%	5%

Data Collection - Commercial Biological Sampling

- Data collected from individual fish:
  - Length
  - Weight
  - Sex
  - Reproductive maturity status (macro)
  - Age structures (goal: 1000/yr coastwide)

population characteristics

Bio data are sent to Newport, entered into a FoxPro db, and sent to PacFIN regularly



Commercial Biological Sampling: Number of Lengths, 2002-11

Assessment Tier	Species	# Length Samples, 2002-2011	Assessment Tier	Species	# Length Samples, 2002-2011	Assessment Tier	Species	# Length Samples, 2002-2011
3	Pygmy RF	1	1	Chilipepper RF	385	1	Longnose skate	6,408
3	Olive RF	2	2	Bank RF	399	3	Pacific sanddab	6,423
3	Rosy RF	3	3	Grass RF	523	1	Widow RF	6,970
3	Butter sole	4	3	Pacific cod	801	3	China RF	6,998
3	Black and yellow RF	23	3	Vermilion RF	802	1	Cabezon	7,289
3	Flathead sole	57	3	Shortraker RF	851	2	Arrowtooth FL	9,129
1	Gopher RF	68	3	Quillback RF	910	1	Lingcod	9,287
3	Tiger RF	72	3	Yellowmouth RF	926	3	Rex sole	9,405
2	Yelloweye RF	118	1	Greenstriped RF	1,444	1	Yellowtail RF	11,901
1	Bocaccio RF	142	2	Starry flounder	1,729	1	Pacific ocean perch	14,141
3	Curlfin sole	154	3	Pacific grenadier	1,822	1	English sole	15,166
2	Greenspotted RF	174	3	Big skate	1,925	2	Longspine TH	15,610
3	Rock sole	177	3	Sand sole	2,177	1	Shortspine TH	17,068
3	Stripetail RF	220	1	Blackgill RF	2,299	1	Petrale sole	17,745
1	Spiny Dogfish	236	2	Blue RF	2,544	1	Darkblotched RF	19,194
3	Redstripe RF	269	1	Splitnose RF	3,404	1	Kelp greenling	20,865
3	Rosethorn RF	341	3	Redbanded RF	3,476	1	Sablefish	29,362
3	Copper RF	361	1	Canary RF	4,115	1	Dover sole	31,224
3	Sharpchin RF	367	3	Aurora RF	4,863	1	Black RF	31,726
3	Silvergray RF	380	3	Rougheye RF	6,201	1	Pacific Hake	54,792

Data Collection - Commercial Logbooks

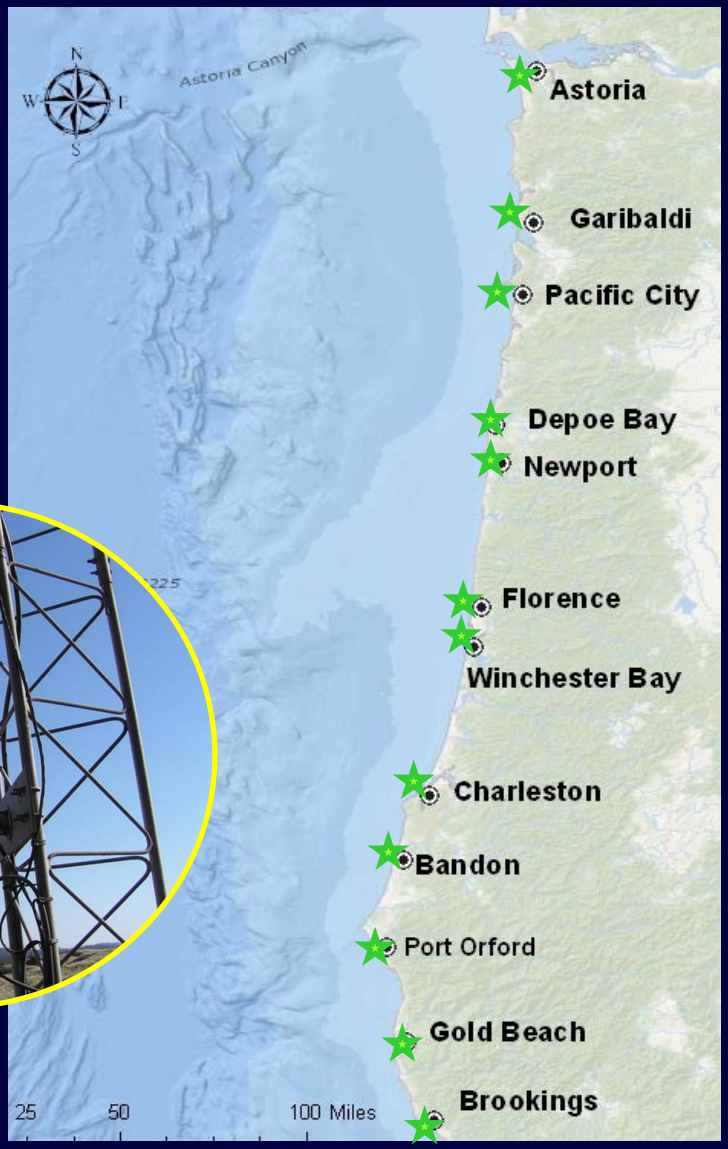
- Groundfish logbooks in OR:
  - Trawl (1976-present)
  - Fixed gear (longline, pot) (2010-present)
  - Nearshore (OR state fishery; hook & line, pot) (2005-present)
- Data recorded by vessel captains:
  - Estimates of retained and (in some fisheries) released catch
  - Location of fishing effort & catch
  - Specific gear type(s)
  - Effort parameters (e.g., tow duration; longline length, # hooks, hook spacing; # pots; etc.)

Data Collection - Recreational Groundfish Fisheries

- Ocean Recreational Boat Survey (ORBS), 2003-present (replaced MRFSS, 1980-2002)
- Onboard Charter Observing Project, 2005-present

Data Collection - Ocean Recreational Boat Survey (ORBS)

- Port-based sampling program
  - Major ports year-round
  - Minor ports Mar-Oct
- Effort: boat counts
  - Estimated # private boat-trips
  - Census of charter anglers
  - Product: # boat trips/port/week



Data Collection - Ocean Recreational Boat Survey (ORBS)

- Catch: angler interviews
  - Goal: 20% trips/port/week
  - Products:
    - # fish (by spp)/boat
    - Lengths & weights (15/species/week/sampler)

population characteristics

- Boat counts and # fish/boat are combined to estimate total catch

removals

Data Collection - Onboard Charter Observing Project

- 2005 - present
- Approximately 100 trips/year
- Data elements:
  - catch rate *CPUE*
  - location *location*
  - L & W of released fish
  - full biological data from retained fish

  population characteristics
- Some data on RecFIN; assessors should obtain from ODFW for complete and related data set

Table 1. Preliminary count by species from recreational groundfish age sampling in FY 2012

Species	Fish (n)
Black rockfish	1114
Blue rockfish	938
Brown rockfish	1
Cabezon	275
China rockfish	227
Copper rockfish	222
Kelp greenling	671
Lingcod	1062
Quillback rockfish	478
Tiger rockfish	148
Vermilion rockfish	183
Total	5,319

Quality Control

- Regular review, adaptive sampling
  - Semi-annual sampling-data team meetings
  - Sampling, data processing methods revised as needed
- Electronic data systems
  - Point-of-entry validations
  - Automated error checks & reports
- Human data review
  - Port biologists review tickets, logbooks, sample data
  - Data technicians & analysts review raw & summarized data

Home > Fish Division > Commercial Fisheries > Species Composition > SC1000 - Validations

From Landing Date 1/1/2012 To Landing Date 12/31/2012

Port 02 - ASTORIA, 05 - GEARHART

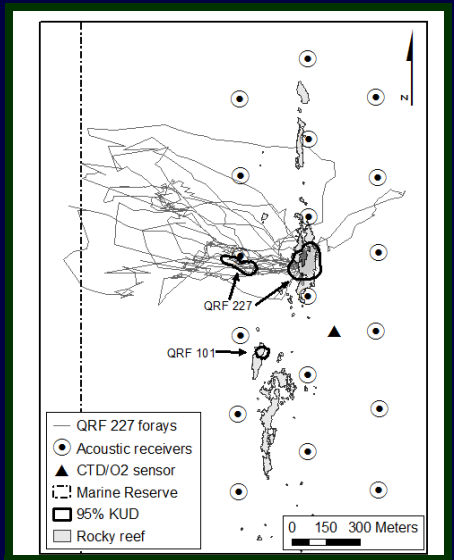
8 of 8 100% Find | Next

OREGON DEPARTMENT OF FISH AND WILDLIFE

Ticket Pounds Mismatch	2012	25702	3428748	40	Sample Landed Pounds:	24	Ticket Pounds:	27.00
	2012	25816	3429916	40	Sample Landed Pounds:	227	Ticket Pounds:	232.00
Missing Market Category	2012	25829	3429269	38	Sample Market Cateogy:	445		
	2012	25678	3428620	40	Sample Market Cateogy:	445		
	2012	26327	3431005	40	Sample Market Cateogy:	442		
Condition Code Mismatch	2012	26327	3431005	40	Sample Condition Code:	9		
Missing Species	2012	25701	3428747	40				

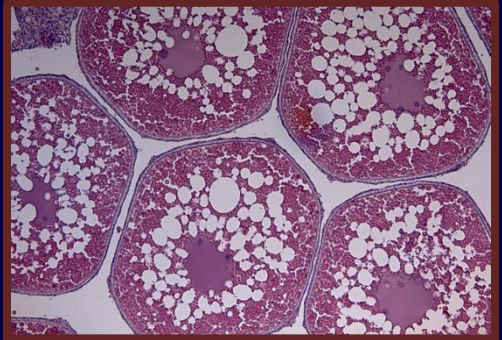
Other OR Groundfish Data

Visual surveys with video lander (stationary cameras) and ROV

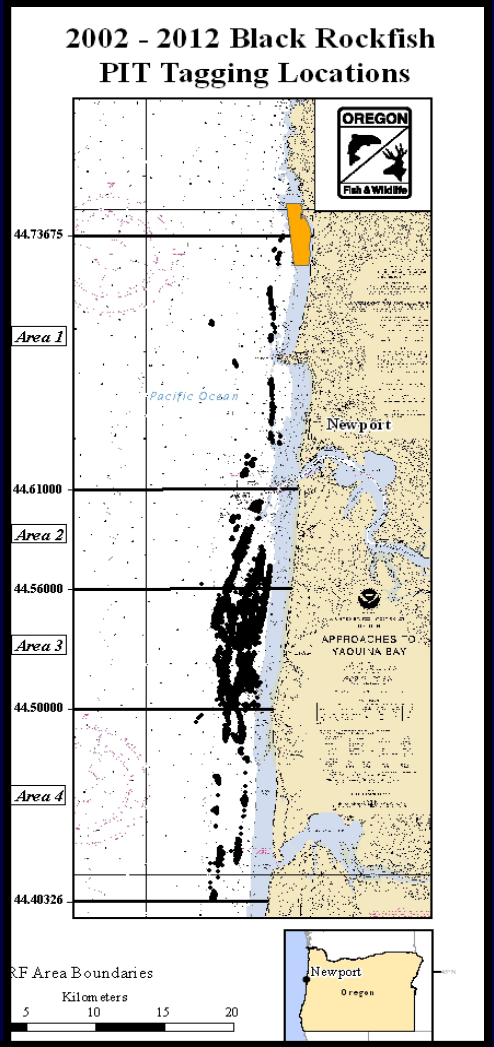


Rockfish movements (here: quillback RF home range & excursions)

Barotrauma & post-release survival



Maturity studies (various species)

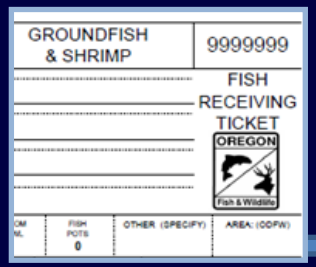


Black RF PIT tagging project (2002-2013)

OR Historic Commercial Catch Reconstruction

- Catch data from 1981-present on PacFIN; earlier data are sparse and de-centralized
- Reconstruction of historical catches done in each assessment
- In 2011, ODFW & NWFSC reconstructed OR commercial catch by species from 1889-1986; data used in 22 recent assessments:
  - *2013 full:* aurora, rougheye, darkblotched RF; petrale sole; sanddabs
  - *2013 data-moderate:* brown, china, copper, sharpchin, stripetail, yellowtail RF; english and rex sole
  - *2011 full:* blackgill, widow RF; sablefish; Pacific ocean perch; Dover sole; dogfish
  - *2011 updates:* yelloweye, darkblotched, canary RF

Oregon Groundfish Data Flow & Access



Fish tickets

ODFW Commercial Fish Data System (SQL Server)

Commercial fisheries: species composition & biological data from landed catch

Recreational fisheries: # fish caught & released by species, reef; average L, W; effort

ODFW ORBS db (MS Access; soon to be SQL)

Recreational fisheries: drift-specific catch by species; L & W of released fish; age structures from retained fish

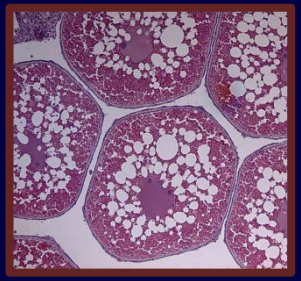
ODFW Onboard Observing db (MS Access)

PacFIN (public/ non-public)

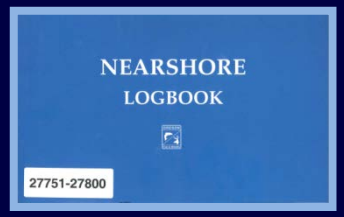
RecFIN (public/ non-public)

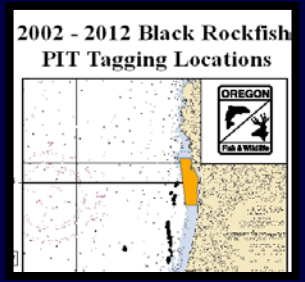
Oregon Groundfish Data Flow & Access

Historical Commercial Catch Reconstruction



Maturity studies





Black Rockfish PIT tagging project data

Non-standard bio samples from commercial fisheries

Onboard Charter Observing Data

Available to authorized users from ODFW

Oregon Groundfish Data: Strengths, Challenges, Opportunities

- Strengths:
  - Experienced commercial sampling staff
  - Fine resolution of data in recent years
  - Historic commercial catch reconstruction
  - Electronic data collection and processing

Oregon Groundfish Data: Strengths, Challenges, Opportunities

- Challenges:
  - Rapidly changing fisheries, increasing demands on sampling program
    - Fewer at-sea discards (→ greater diversity in landings)
    - More market categories, longer fishing seasons
  - Declining staffing & budget
    - Both federal (including NOAA) and state funding supporting fishery data collection in OR decreased this year
    - Insufficient data management/IT development capacity
  - Ad hoc communication with assessors on available data, caveats, and data needs

Oregon Groundfish Data: Strengths, Challenges, Opportunities

- Opportunities:
  - Restore adequate funding for base sampling
  - With NWFSC, establish more consistent communication between stock assessors & ODFW
    - Evaluate & adapt current data collection, plan for future needs (e.g., priority species for biological samples? Maturity methods?)
    - Advise on anomalies/changes in data, fishing behavior, etc.
  - Evaluate option to involve federal catch monitors in sampling
  - Expand ODFW data system capabilities, work with RecFIN and PacFIN to improve data holdings & access
  - Expand fishery-independent data collection
    - Non-lethal visual assessments
    - Hook & line (or other gear) surveys in untrawlable habitat

Questions?