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Overview of the Pacific Sardine Fishery

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Background:
Pacific Sardine
(northern subpopulation)

Range from northern Baja California, Mexico, to British Columbia, Canada, and up to 300 nm offshore

Live up to 15 years, commercial catches usually younger than 6 years, typically larger and 2-3 years older in regions off the PNW

May reach 41 cm in length, but seldom longer than 30 cm

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Background: History of Fishery

1930s and 1940s

- Largest fishery in western hemisphere
- Landings over 700,000 mt

1940s and 1950s

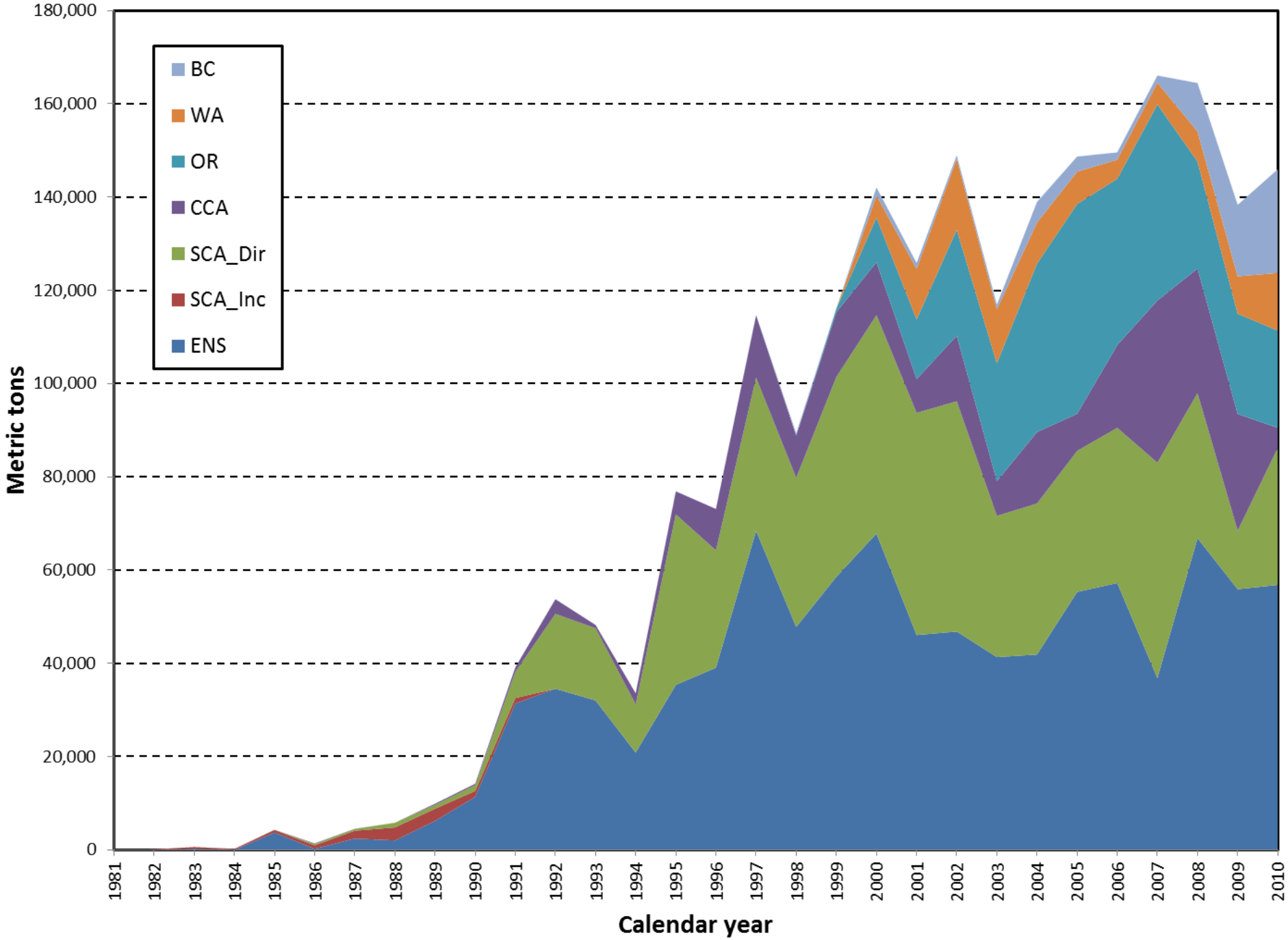
- Population and fishery decline, landings ceasing in PNW in 1948 and San Francisco in 1952

1960s and 1970s

- Fishery collapses; moratorium on landings

Background: Recovery/Expansion

- **1980s:**
  - low abundance, confined to SCA; minor fisheries in SCA & ENS
- **1990s:**
  - Expansion offshore and north to Central California;
  - CCA fishery begins;
  - Pop'n growth = 33%;
  - Sardine in OR, WA, and BC
- **2000s:**
  - Fisheries in Pacific NW
  - Seasonal movement north-south, inshore/offshore


BC
WA
OR
CCA
SCA_Dir
SCA_Inc
ENS
Metric tons
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Calendar year

Background:
Present Distribution

Summer/Fall Feeding Habitat

Winter/Spring Spawning Habitat

Nursery Habitat

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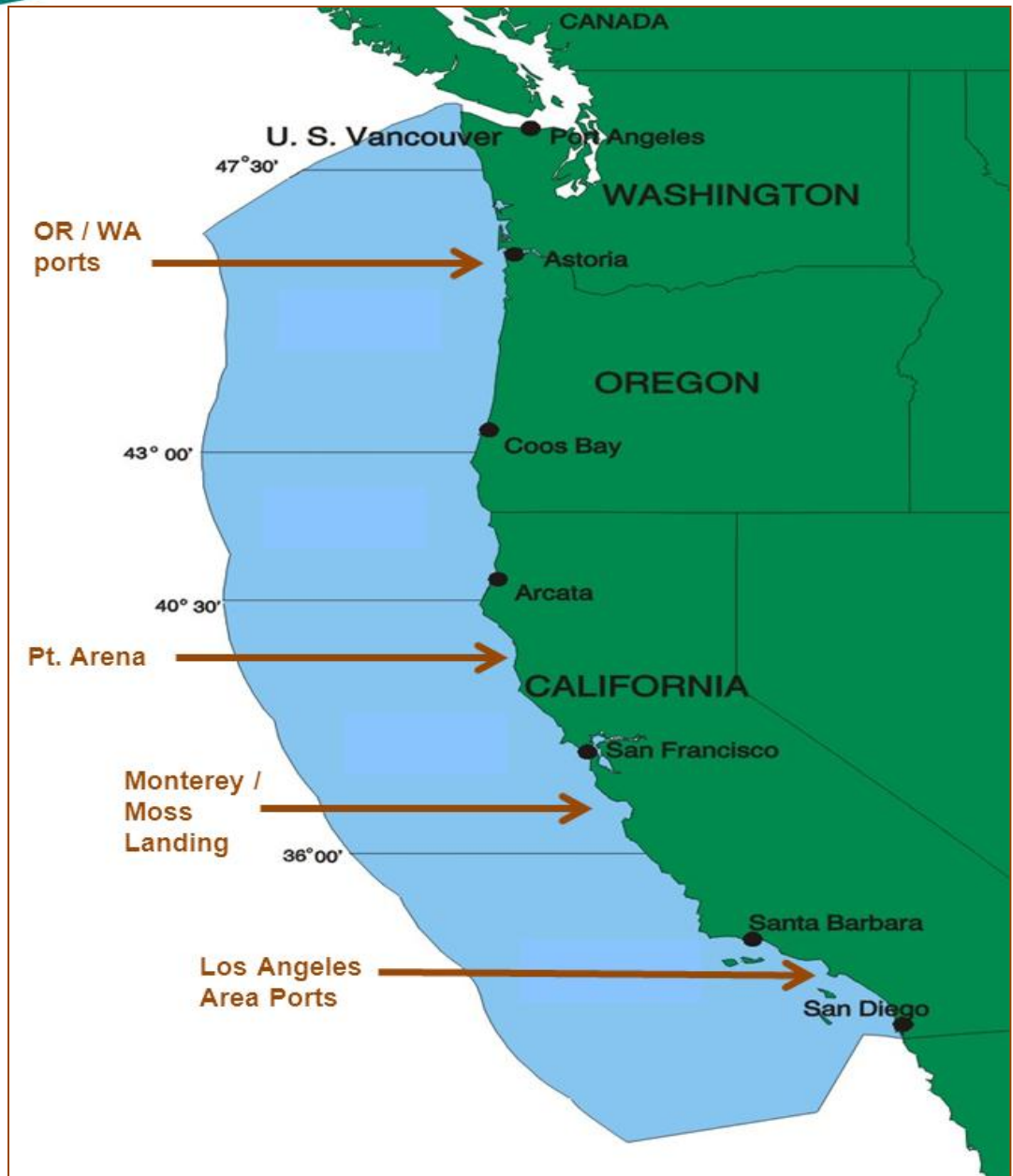
3 main fishing areas

6 ports
- ~ 12 processors

Fishing occurs near ports

PNW
- Summer/early Fall
- Day

California
- Year round
- Night



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Management: Coastal Pelagic Species (CPS) Fishery Management Plan (FMP) (1999)

Management Categories

- Actively managed – Stock assessments, annual management, harvest guidelines
  - ***Pacific sardine***, Pacific mackerel
- Monitored – Low harvest rates, multi-year management, state management
  - Northern anchovy, market squid
- Prohibited harvest species (2009)
  - Krill

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Management: Capacity Restrictions/ Vessel Number Limitations

Federal Limited Entry

- South of 39° N. latitude (Pt. Arena, CA)
  - CPS permit (>5mt); 65 permits; 30 vessels in 2011
- North of 39° N. latitude – Open Access

State Limited Entry

- Oregon: 25 permits; 17 vessels in 2011
- Washington: 25 permits; 7 vessels in 2011

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Management: Quota/Harvest Guideline

Annual Management/Stock Assessments

January 1 – December 31

Harvest Guideline Formula:

$HG_{year+1} = (BIOMASS_{year} – CUTOFF) \bullet FRACTION \bullet DISTRIBUTION$

—Maximum directed commercial harvest level
—Maintain spawning biomass, consistent/level catch, forage

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Management: Seasonal/Spatial Allocation of HG

Original Allocation Scheme:

Initial allocation:

—January 1

- 33% of the HG is allocated to the Subarea A (north, which includes Monterey)
- 66% to the Subarea B (Southern California).

Reallocation (Remaining unharvested portion is pooled and reallocated) :

—October 1

- 50% to Subarea A (north)
- 50% to Subarea B (south).

The allocation subareas are divided at Point Piedras Blancas, California (35° 40° N latitude)

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Management: Seasonal/Spatial Allocation of HG

Interm Allocation Scheme (2003-2005):

Initial allocation:

— January 1
- 33% of the HG is allocated to the Subarea A - *(Nor. Ca and PNW)*
- 66% to the Subarea B - *(Southern and Central California).*

Reallocation (Remaining unharvested portion is pooled and reallocated) :

— *September 1*
- *20% to Subarea A (north)*
- *80% to Subarea B (south)*

Second Reallocation:

— December 1
- Released coastwide

Divided at Pt. Areana

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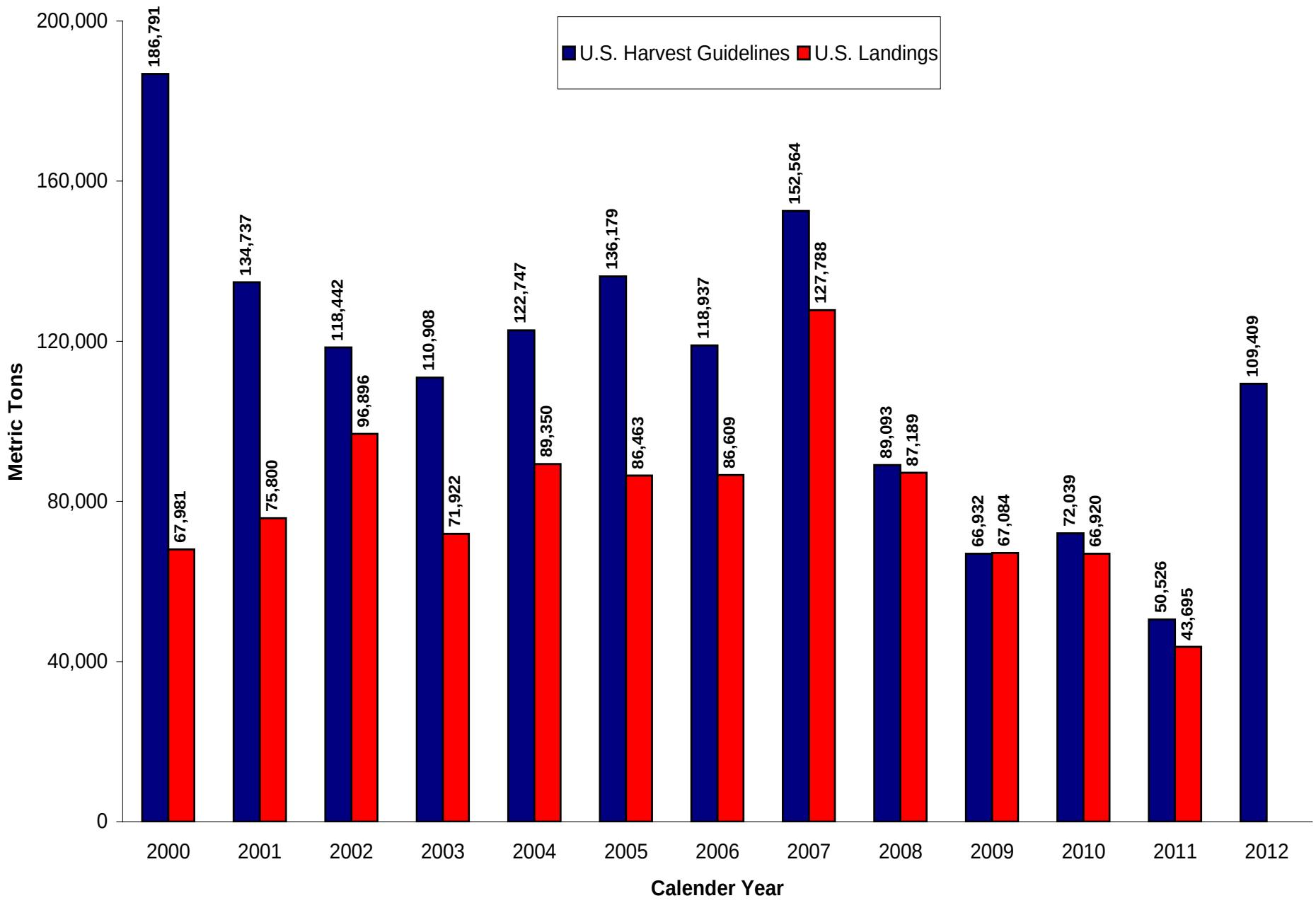
Management: Current Allocation Structure

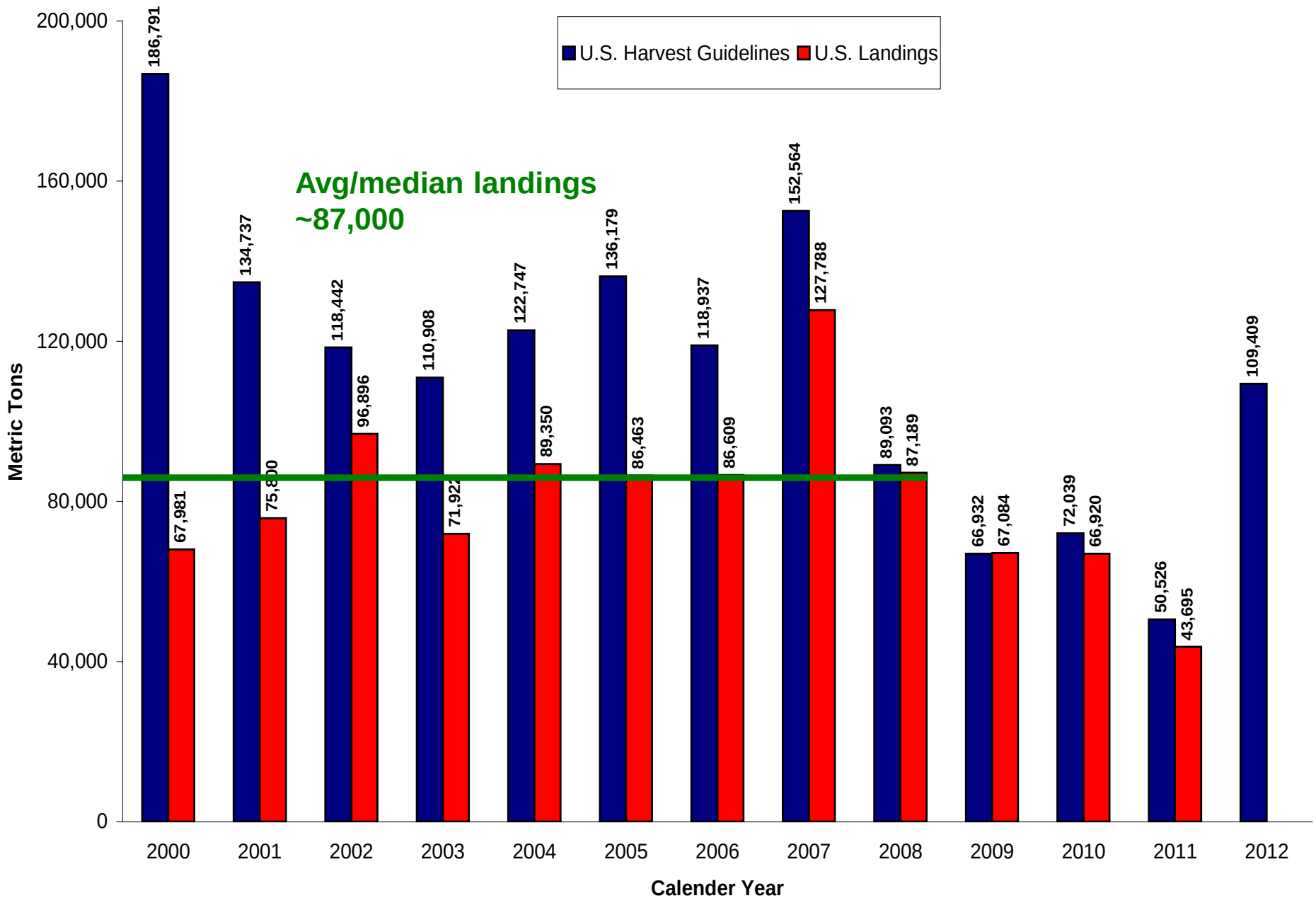
Amendment 11 (2006): Coastwide allocation

January 1
— 35%

July 1
— 40% (plus any remaining)

September 15 (plus any remaining)
— 25%


U.S. Harvest Guidelines
U.S. Landings
Metric Tons
200,000
160,000
120,000
80,000
40,000
0
186,791
67,981
134,737
75,800
118,442
96,896
110,908
71,922
122,747
89,350
136,179
86,463
118,937
86,609
152,564
127,788
89,093
87,189
66,932
67,084
72,039
66,920
50,526
43,695
109,409
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Calender Year


U.S. Harvest Guidelines
U.S. Landings
Avg/median landings
~87,000
Metric Tons
Calender Year
200,000
160,000
120,000
80,000
40,000
0
2000
2001
2002
2003
2004
2005
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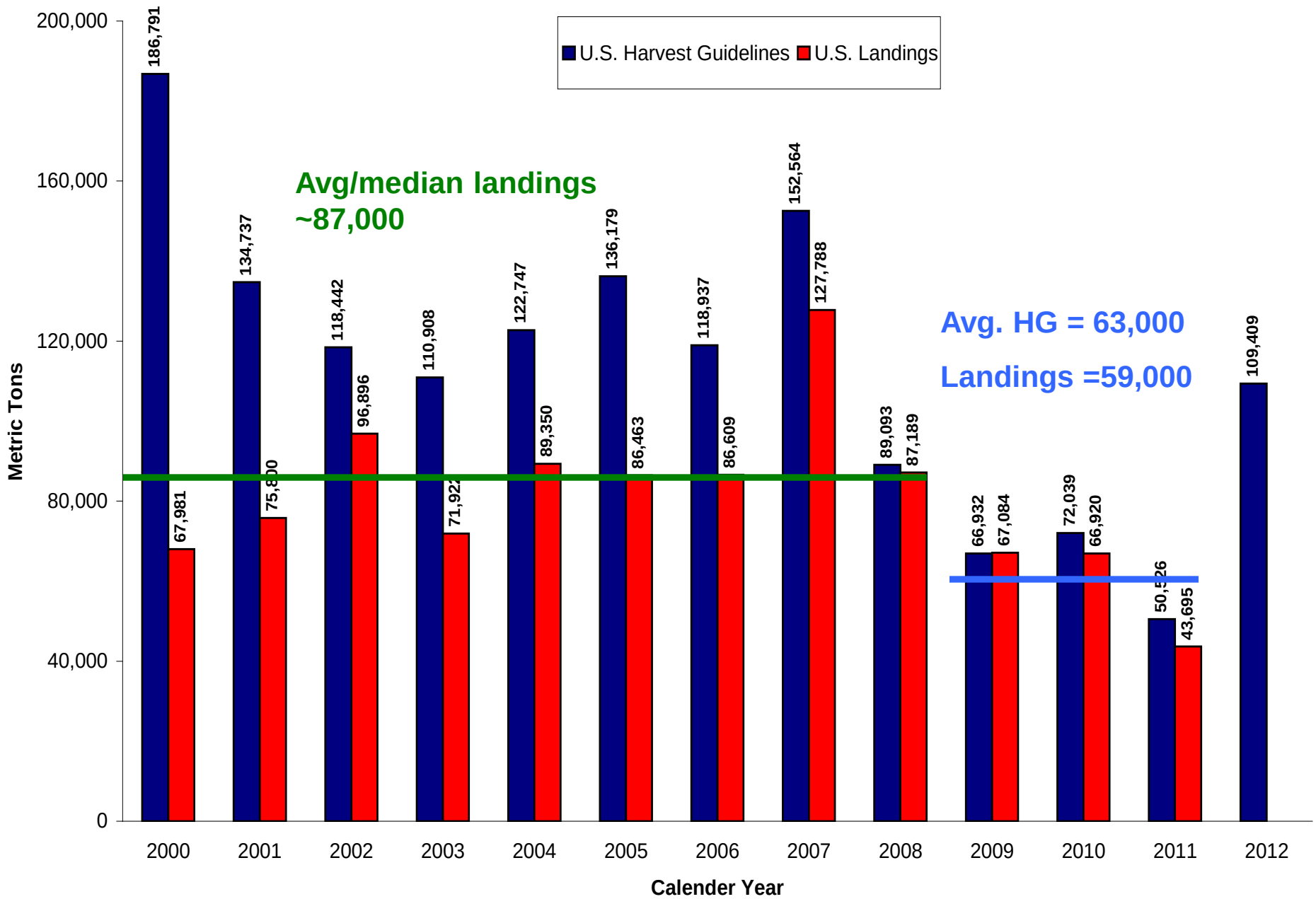
U.S. Harvest Guidelines
U.S. Landings
Avg/median landings
~87,000
Avg. HG = 63,000
Landings =59,000
Metric Tons
Calender Year
200,000
160,000
120,000
80,000
40,000
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
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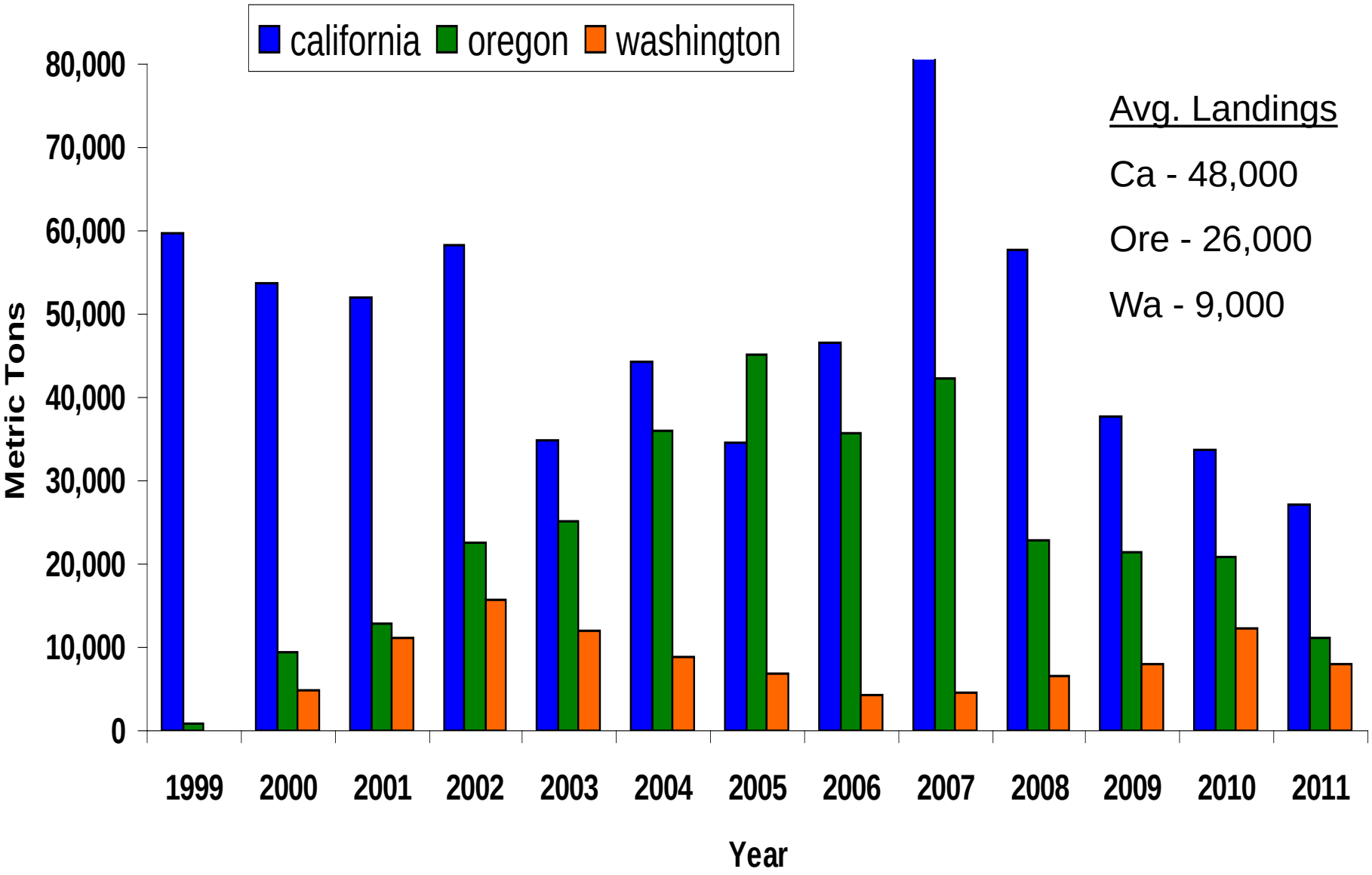
california
oregon
washington
Avg. Landings
Ca - 48,000
Ore - 26,000
Wa - 9,000
Metric Tons
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Year

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Background: Number of fishing days

Year	1st period	2nd period	3rd period
2006	181 (not closed)	76 (not closed)	108 (not closed)
2007	181 (not closed)	76 (not closed)	108 (not closed)
2008	150	39	8
2009	51	18	9
2010	163	22	10
2011	64	12	7

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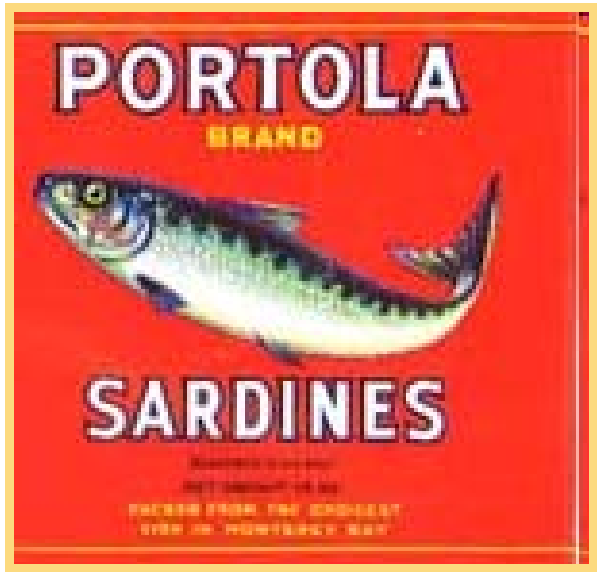
Questions/Corrections?



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Questions/Corrections?

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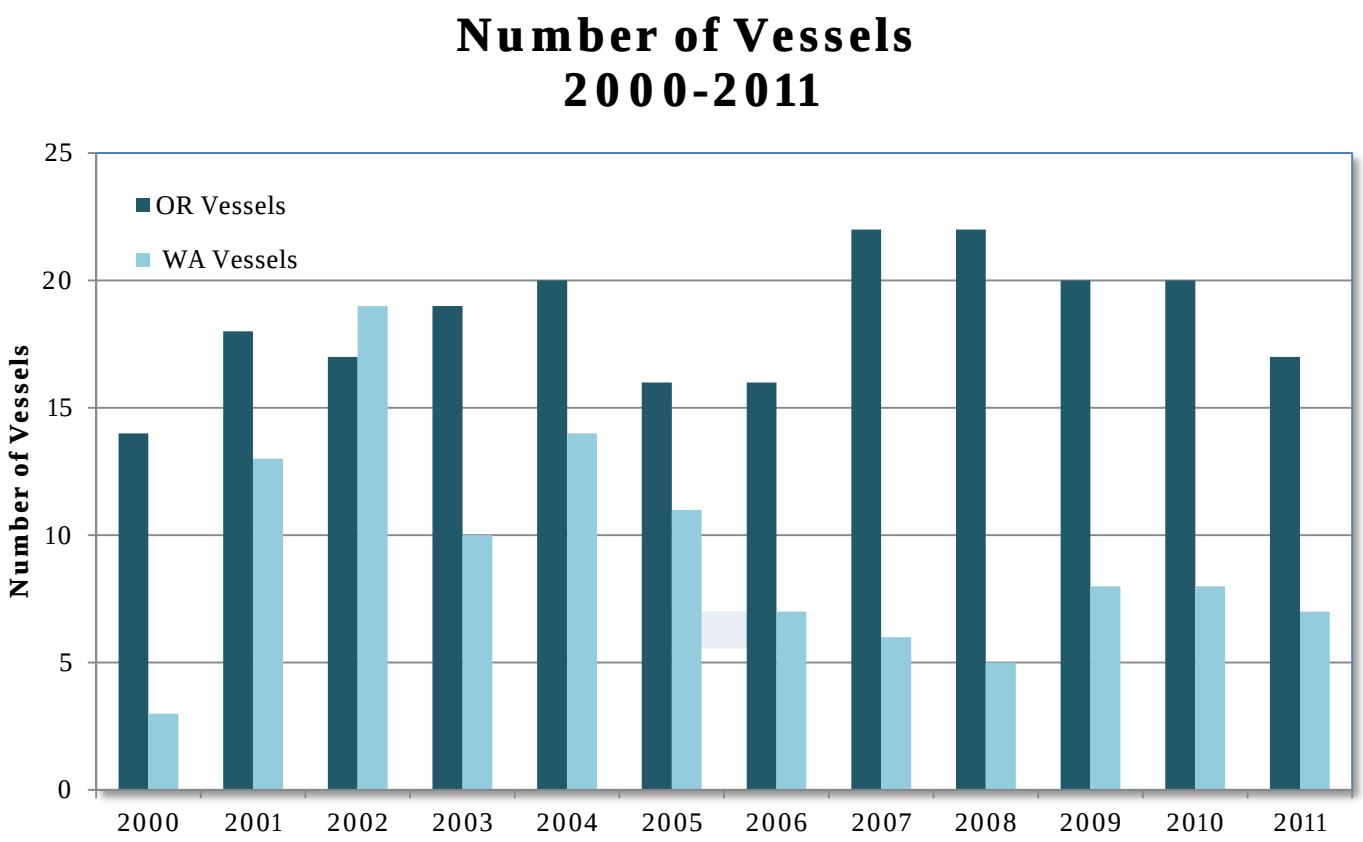
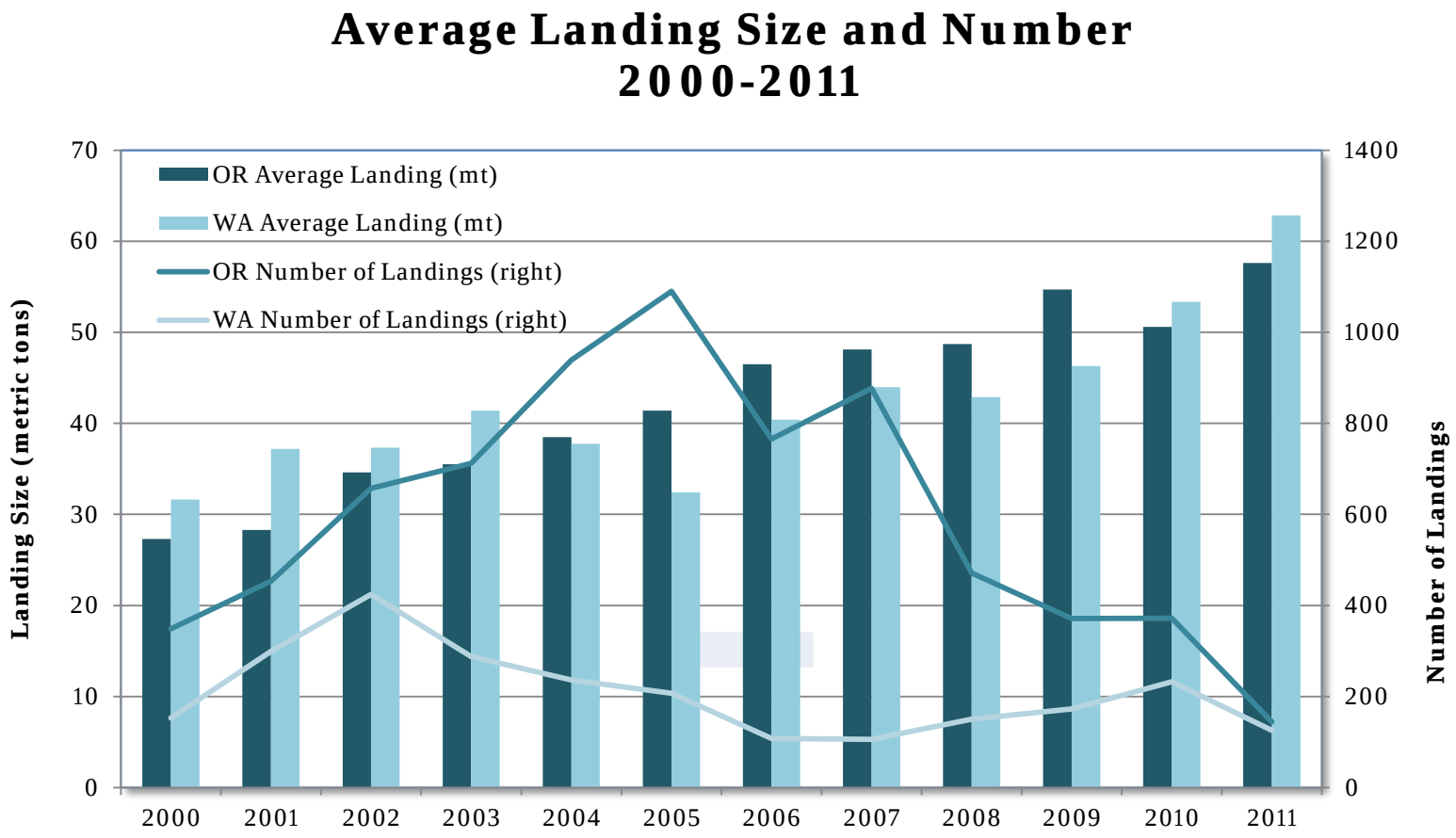
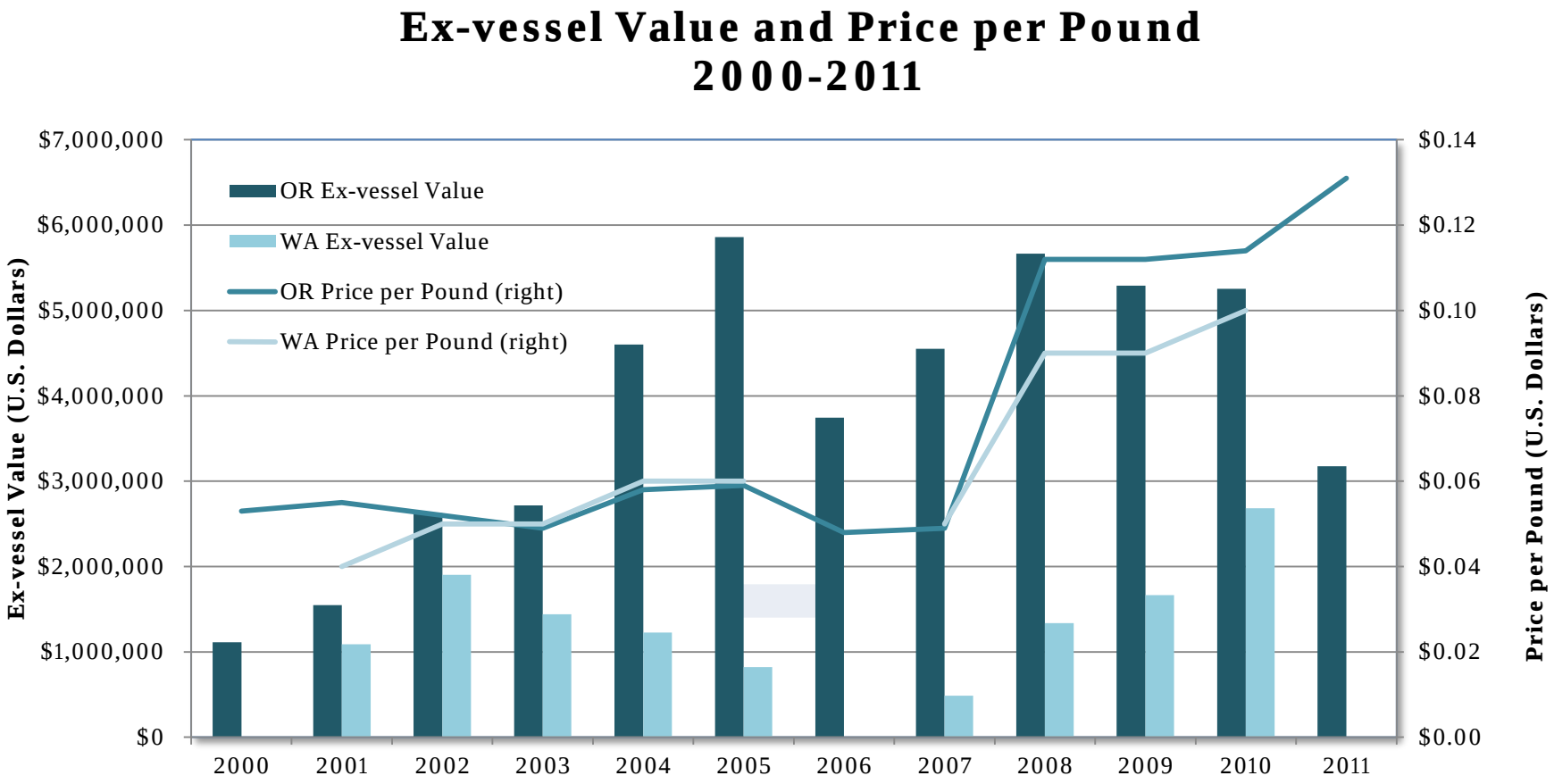
CANADA
U. S. Vancouver
Port Angeles
47°30'
WASHINGTON
OR / WA
ports
Astoria
OREGON
43° 00'
Coos Bay
40° 30'
Arcata
Pt. Arena
CALIFORNIA
San Francisco
Monterey /
Moss
Landing
36°00'
Santa Barbara
Los Angeles
Area Ports
San Diego



- OR – 17 vessels in 2011, maximum of 22 in 2007 and 2008; 25 permits available
- WA – 7 vessels in 2011, maximum of 19 in 2002; 16 permanent permits, 9 temporary annual permits

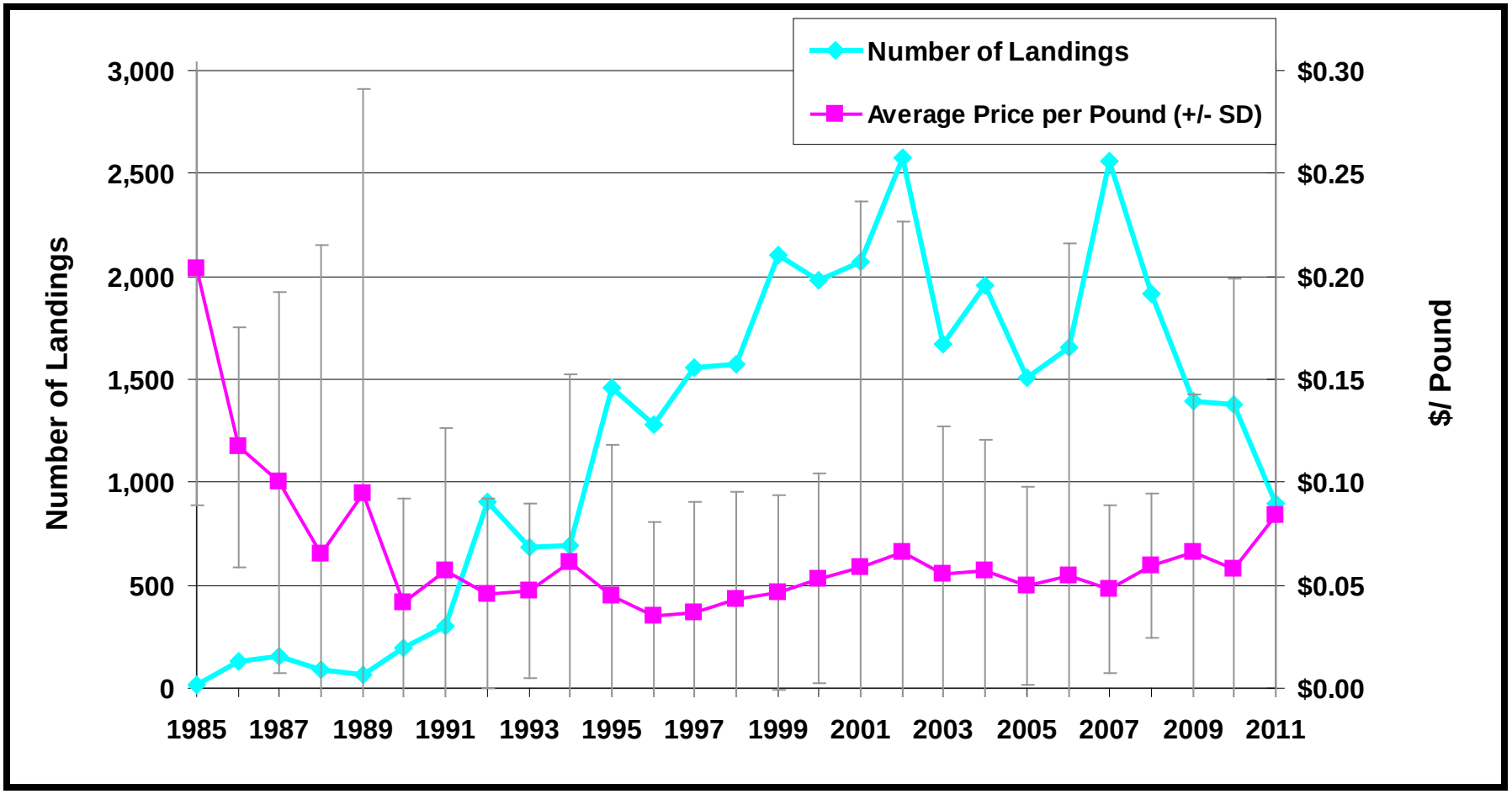


- OR – Range from 27.3 to 57.9 in 2011; 144 landings in 2011, maximum of 1090 in 2005
- WA – Range from 31.6 to 62.8 in 2011; 126 landings in 2011, maximum of 424 in 2002



- OR – Value is $3.2 million in 2011, maximum value of 5.8 million in 2005; Price per pound $0.13 in 2001, ranged from $0.05 until 2008 when prices increased

- WA – 2011 value is not reported yet in PacFIN, $2.6 million in 2010; Price per pound ranged from $0.04-0.06 until 2008 when price increased to $0.10 in 2010; 2000 and 2006 values not reported


Number of Landings
Average Price per Pound (+/- SD)
3,000
2,500
2,000
1,500
1,000
500
0
$0.30
$0.25
$0.20
$0.15
$0.10
$0.05
$0.00
Number of Landings
$/ Pound
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011