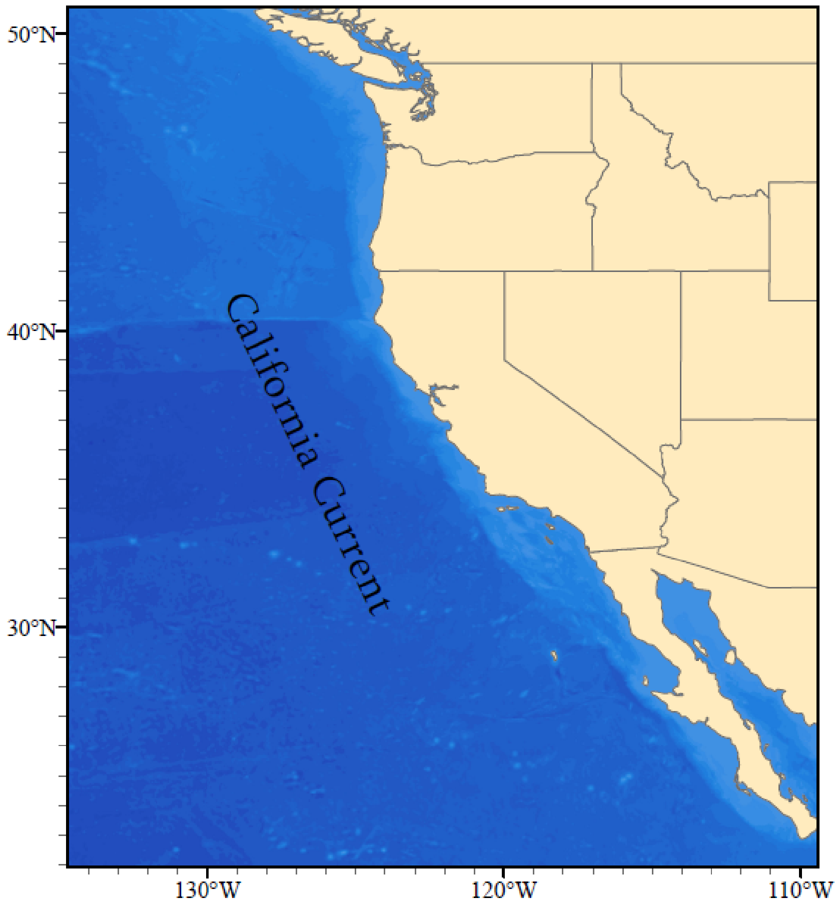
April-June 2012
Volume 5, Quarter 2

Climatic and Ecological Conditions in the California Current LME for April to June 2012

Summary of climate and ecosystem conditions for Quarter 2, 2012 (April to June) for public distribution, compiled by PaCOOS coordinator Rosa Runcie (email: Rosa.Runcie@noaa.gov).
Full content can be found after the Executive Summary. Previous summaries of climate and ecosystem conditions in the California Current can be found at http://pacoos.org/



CLIMATE CONDITIONS IN BRIEF

- **El Niño Southern Oscillation (ENSO):** ENSO-neutral conditions prevailed in May 2012 and are expected to continue into the summer. As of June 2012, there is a 60% chance that El Niño conditions will develop during the second half of the year.
- **The Oceanic Niño Index (ONI):** The ONI continued to be weakly negative through May 2012. In June it was a neutral 0.0, in apparent transition to ENSO-neutral conditions.
- **Pacific Decadal Oscillation (PDO):** The PDO has remained weakly negative and variable since January 2012.
- **Upwelling Index (UI):** UIs for March, April, May and June 2012 showed a clear seasonal division with UIs for March and April low compared to the UIs for May and June. In March and April, UIs were negative north of 42°N. South of 48°N the April UI was consistently higher than in March. May UI was negative at 54°N and strongly positive from 24°N to 39°N. The UI at 45°N from late May thru June indicated anomalously weak upwelling, contributing to the warmer than average sea surface temperature off Oregon in June.

- **Water Temperature and Salinity at Newport Hydrographic Line, Oregon:** The year began with colder-than-average deep waters over the inner-middle shelf. During the second quarter, the bottom waters were moderate in temperature and less salty than previous years.
- **Trinidad Head Line, California Observations:** Observations along the Trinidad Head Line indicate continued evidence of mild upwelling into summer 2012, which is consistent with the persistence of southerly wind and rain events into July. Phytoplankton concentrations have remained low in early 2012, and so far the shelf waters off Trinidad Head appear to be less productive than has been observed in the early months of recent years.
- **Spring 2012 CalCOFI Observations:** The average nitracline depth, the depth where concentrations of nitrate reach values of 1uM, was unusually shallow during the spring cruise. Surface layer Chl *a*, was high off Point Conception. Relatively high concentrations of Chl *a* were observed below the mixed layer in the areas where high Chl *a* had been observed during the winter 2012 cruise. These observations suggest that the system had already undergone at least one upwelling-bloom cycle prior to the spring cruise. During the spring cruise unusually high abundances of gelatinous zooplankton were encountered, these patterns have not yet been quantified. Gelatinous zooplankton was most abundant north of Point Conception and in the offshore waters.

ECOSYSTEM CONDITIONS IN BRIEF

- **California Current Ecosystem Indicators:**
    1. **Copepods:** The abundance (biomass) of northern copepod species was at a record high through the first half of 2012. These species are considered to be a beneficial component of the food-web for many upper trophic level organisms, including salmon.
    2. **Juvenile Rockfish:** The midwater trawl survey for juvenile rockfish and other pelagic nekton along the Central California coast in late spring (May-June) showed that trends in 2011 and 2012 were of higher productivity for the species and assemblages that tend to do better with cool, high transport conditions, including juvenile rockfish, market squid and krill. Market squid and krill were at above average levels in 2011, and very high levels in 2012.

       Salmon: Despite a slow start to the Spring Chinook salmon run passing by the Bonneville Dam on the Columbia River (only 39 fish counted through March), the total number counted by the end of May (158,075) was a little above the 15 year average. Sockeye salmon, however, have been returning in record numbers. The 2012 sockeye salmon cumulative total of more than 500,000 fish has been phenomenal for the lower Columbia River, exceeding all totals since the late 1930s. The number of Lake Washington sockeye migrating through Ballard Locks totaled 130,000 fish by mid-July, exceeding predicted returns. Fraser River sockeye runs are predicted to be below historical average returns at about a million fish.

- **Harmful Algal Blooms:**

  Oregon: Phytoplankton observations showed an increase in species diversity among the nearshore community starting in May. Throughout May, June and July only very small accumulations of *Pseudo-nitzschia* were detected coast wide. Domoic acid levels in shellfish tissue remained undetectable during the time of this report.

  California: Domoic acid was not detected in any shellfish samples during the months of April and May. Domoic acid concentrations in shellfish increased from non-detectable levels mid-June to above alert level late-June in outer Morro Bay. Low concentrations of paralytic shellfish poisoning (PSP) toxins were detected in sentinel mussels from Drakes Estero early in April. PSP toxins were not detected in any bivalve shellfish samples during May and early June.

PACIFIC COAST FISHERIES MANAGEMENT SUMMARIES IN BRIEF

- **Coastal Pelagics:**

  Pacific Sardine: Pacific sardine landings in California remained slow during the second quarter of 2012. The California fleet landed 46% of the adjusted coastwide allocation of 33,093 metric tons (mt) by the end of June.

  Pacific Mackerel: California commercial landings of Pacific Mackerel were 100 – 300 mt in the second quarter of 2012 for an annual total of 919 mt. Jack Mackerel landings were lower and totaled 33 mt for the year.

  Northern Anchovy: The total California anchovy landings for 2012 up thru June are 2,376 mt.

  Market Squid: The commercial 2012-13 Market Squid season opened in April, but there was little catch until June when 1,363 mt were landed in southern California ports.

CLIMATE CONDITIONS

El Niño Southern Oscillation (ENSO):

Source:**http://www.cdc.noaa.gov/people/klaus.wolter/MEI/mei.html,**
http://www.cpc.noaa.gov/products/analysis_monitoring/enso_advisory/

ENSO-neutral conditions prevailed in May 2012, following the dissipation of La Niña in April as below-average sea surface temperatures (SST) weakened across most of the equatorial Pacific Ocean and above-average SSTs persisted in the east. During June 2012, ENSO neutral continued as reflected in both the oceanic and atmospheric anomalies.

Multivariate ENSO Index (MEI) values from 2009 to June 2012 are shown in Figure 2.

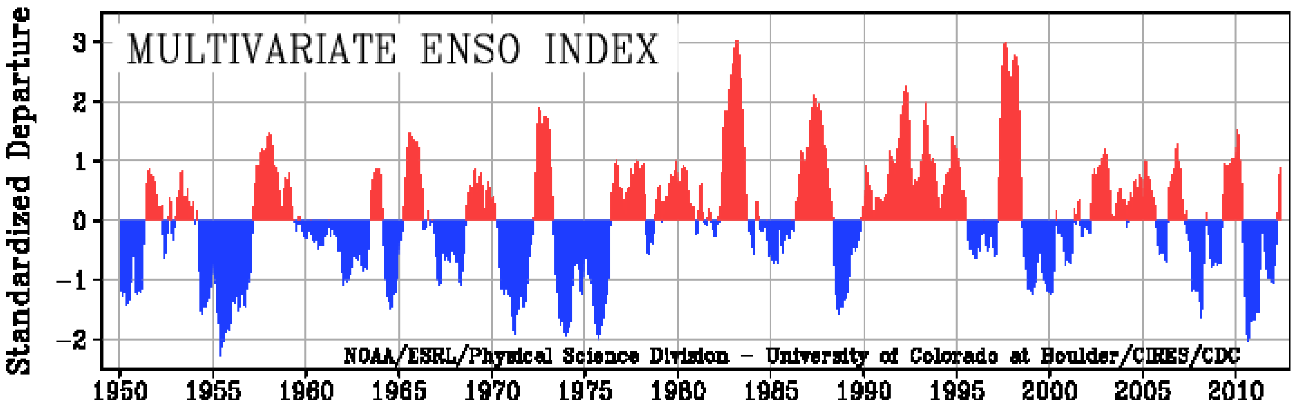


Figure 1. NOAA Physical Sciences Division attempts to monitor ENSO by basing the Multivariate ENSO Index (MEI) on the six main observed variables over the Pacific. These six variables are: sea-level pressure, zonal and meridional components of the surface wind, sea surface temperature, surface air temperature, and total cloudiness fraction of the sky.

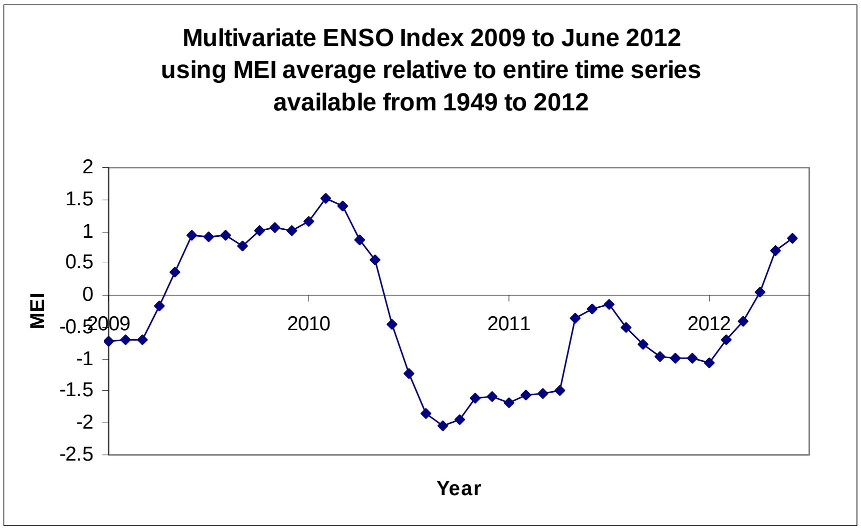


Figure 2. Multivariate ENSO Index from 2009 to March 2012. Mean used from bimonthly MEI values from the entire MEI Index time series, starting with December2008/January2009 thru May2012/June2012 (http://www.esrl.noaa.gov/psd/enso/mei/table.html).

Central & Eastern Equatorial Pacific Upper-Ocean (0-300 m) Heat Content Anomalies:
Source: The Coast Watch **http://coastwatch.pfel.noaa.gov/elnino.html**
http://www.cpc.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.doc

Negative subsurface temperature anomalies from late July 2011 through March 2012 reflected La Niña. Since April 2012, the anomalies have been positive with increases during April and June.

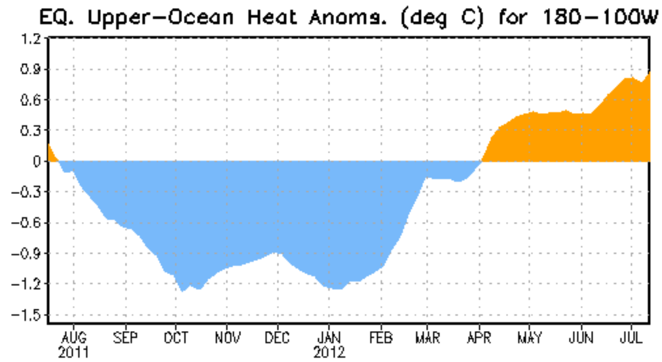


Figure 3. Area-averaged upper-ocean heat content anomalies (°C) in the equatorial Pacific (5°N-5°S, 180°-100°W). Heat content anomalies are computed as departures from the 1982-2004 base period pentad means.

PDO, ONI and SST at NOAA Buoy 46050, Newport OR:
Source: Bill Peterson, NOAA, NMFS

Since the start of 2012, La Niña conditions have weakened, as indicated by less negative values of the Pacific Decadal Oscillation (PDO) and Oceanic Niño Index (ONI). According to the NOAA Climate Prediction Center, a transition to ENSO–neutral conditions occurred during April 2012, as sea surface temperatures at the equator increased to near–average values across much of the equatorial Pacific Ocean with above-average temperatures in the far Eastern Pacific.

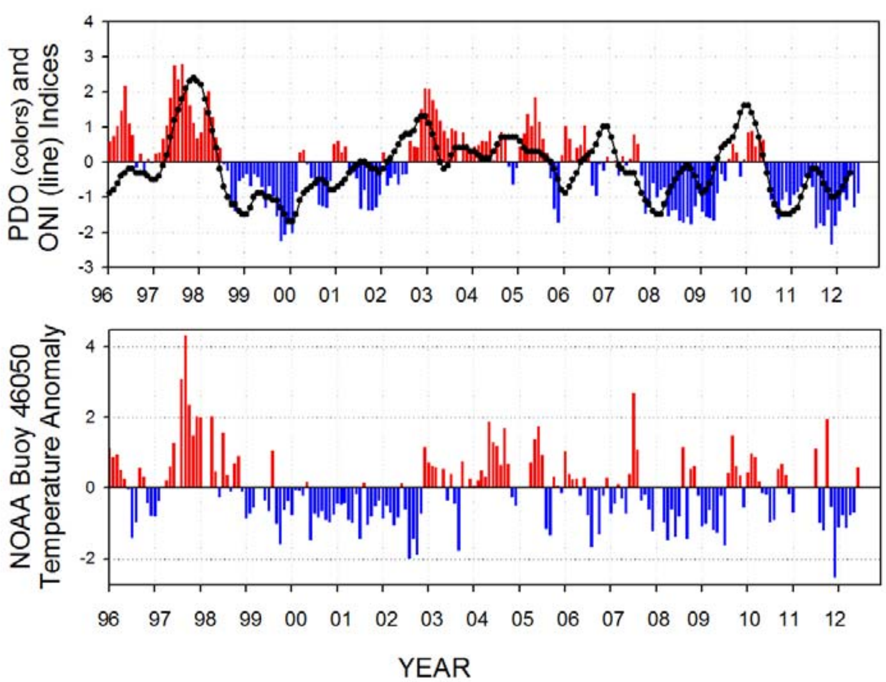


Figure 4. Time series of the PDO and ONI (upper panel) since 1996 and time series of SST (lower panel) measured at NOAA Buoy 46050 20 miles West of Newport, Oregon. Note that both the PDO and ONI have become less negative since the end of 2011. This trend is also reflected in the local SST. All are indicators that ocean conditions are becoming less favorable for many species, including salmon.

Upwelling Index:

Source: Jerrold Norton, NOAA, ERD, SWFSC (Jerrold.G.Norton@noaa.gov)

***Pacific Fisheries Environmental Laboratory* http://www.pfeg.noaa.gov/products/PFEL/, *monthly surface pressure maps:* http://www.pfeg.noaa.gov/products/PFEL/modeled/pressure_maps/pressure_maps.html, *monthly IU values:* http://www.pfeg.noaa.gov/products/PFEL/modeled/indices/upwelling/NA/data_download.html**

Upwelling indices (UIs) computed from geostrophic winds derived from monthly mean pressure fields for March, April, May and June 2012 showed a clear seasonal division with UIs for March and April low compared to the UIs for May and June (see Figure). Indices for December 2011 through March 2012 had similar variability with latitude. In March and April, UIs were negative north of 39°N, indicating lower than average upwelling south of 42°N and higher than average northward coastal winds to the north. South of 48°N the April UI was consistently higher than the March UI, although the anomalies for these two months are similar through their range. May UI was negative at 54°N and strongly positive from 24°N to 39°N. From 24°N through 48°N, UIs reach maximum values from May through July when the high atmospheric pressure system offshore is most intense. This is reflected in the large UI values observed from 27°N to 39°N in May and June. June UI values were near zero poleward from 45°N and anomalies were weakly negative in these areas. June UIs were strongly positive south of 42°N, where UI anomalies were 20% to 40% of the average UIs, continuing the seasonal tendency to stronger than seasonal forcing of the coastal upwelling system.

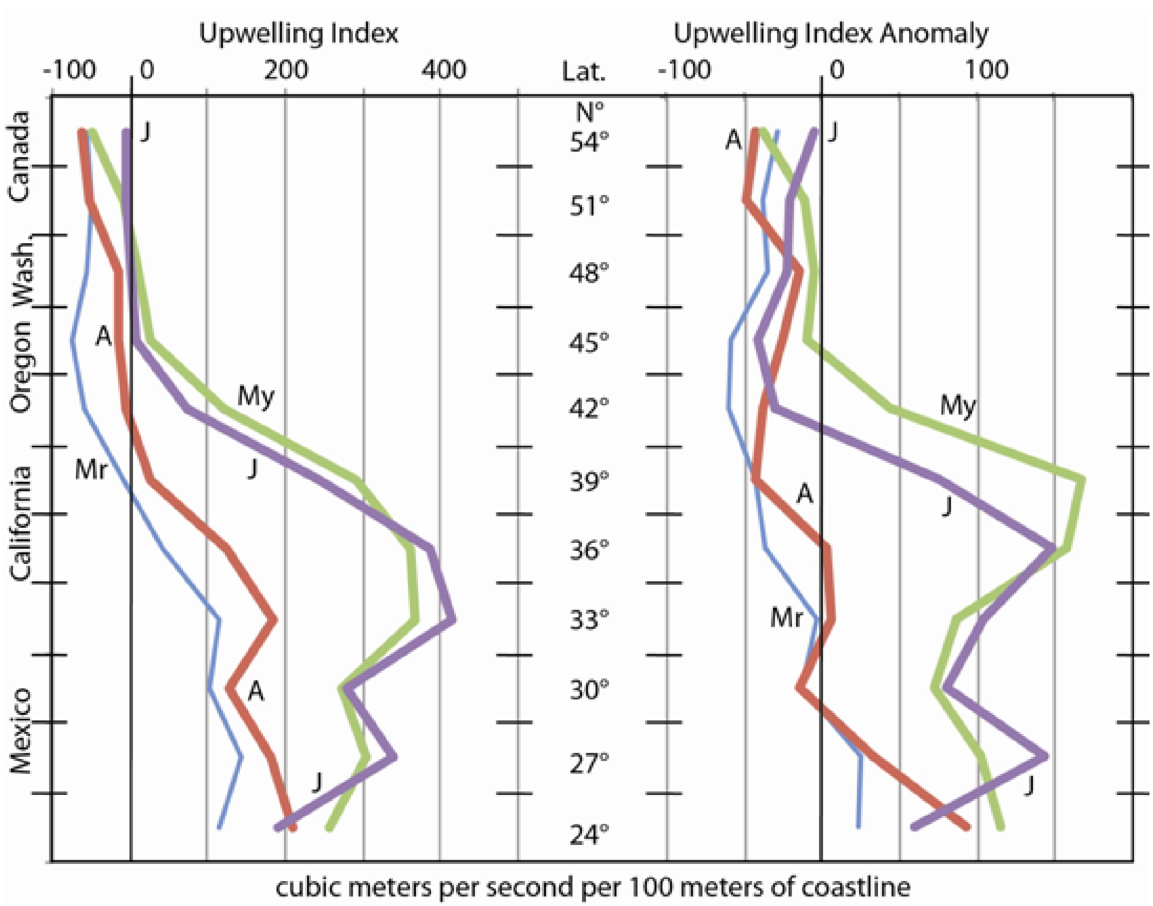


Figure 5. Variation of upwelling index (left) and upwelling index anomaly (right) with latitude is shown for four consecutive months. There is one line per month: March (thin, blue), April (red), May (green) and June (heavy, blue) 2012. Graph units are in cubic meters per second per 100 meters of coastline (top). These monthly upwelling indices (UIs) are computed from monthly mean pressure fields and give a quantitative measure of atmospheric forcing of the coastal upwelling system. Monthly UI and UI anomaly values are shown for each three degrees of latitude from 24°N to 54°N (center).

Coastal Upwelling at 45° N

Source: Bill Peterson, NOAA, NMFS

The start of upwelling was on May 3rd (Day 123) this year, over 2 weeks later than usual and the 3rd latest start in the past 15 years. Once upwelling started there were strong north winds for several weeks but by June the winds had diminished and overall the season has had uncharacteristically low amounts of upwelling (Figure 6). This has contributed to the warmer than average SST in June (Figure 4, bottom panel).

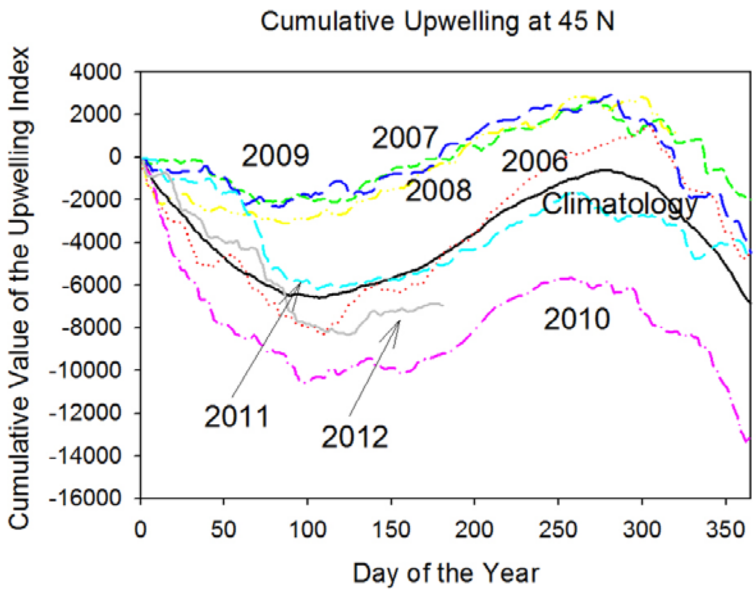


Figure 6. Cumulative upwelling values for 45°N, from the PFEL website. Note the relatively flat line at the end of the 2012 time series, indicating little to no upwelling from late May thru June.

Regional Oceanic Conditions:

***Source: El Niño Watch, Advisory* http://coastwatch.pfel.noaa.gov/cgi-bin/elnino.cgi**

Monthly mean SST and SST anomalies derived from NOAA AVHRR sensors showed that the ocean off the west coast of the US cooled during the first quarter of 2012 then the trend reversed in April and warming occurred through the second quarter. The 14°C isotherm was at about 35°N in May. By June it had migrated poleward to 40°N at 130° W and delineated the coastal upwelling zone along the coast south of 39°N. Surface waters were cooler in the upwelling zone with negative SST anomalies around Cape Blanco (43°N), Cape Mendocino (40.5°N) and south of Monterey Bay (36°N). In June negative anomalies persisted in a band 100 kilometers (km) to 1000 km offshore from north of Vancouver Island to the Baja California Peninsula and in the northeastern Pacific north of 45°N. Positive SST anomalies appeared in the Southern California Bight during May and June.

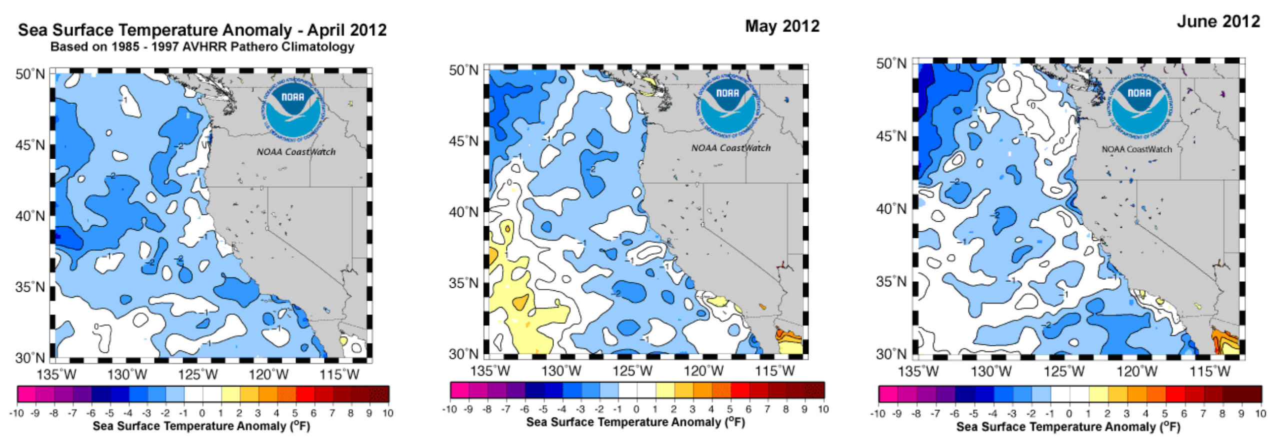


Figure 7. Regional oceanic conditions in the California Current Region.

Water Temperature and Salinity along the Newport Hydrographic Line, OR in Quarter 2, 2012:

Source: Bill Peterson, NOAA, NMFS

The year began with colder-than-average deep waters over the inner-middle shelf off Newport (44.65°N). During the second quarter, bottom water temperature was near the 1997-2012 mean and was slightly less salty than the previous two years. This is likely driven by the late onset and relatively weak upwelling (and downwelling) during spring 2012 and anomalously high rainfall. Together, these conditions did not result in the typically cold and salty water from offshore being upwelled along the bottom to this inshore station.

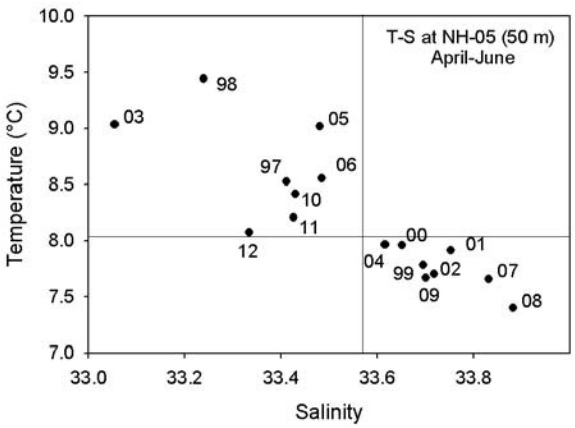


Figure 8. Temperature and salinity measured at a depth of 50 m at a baseline station (NH 05) located 9 km off Newport, OR. Data are from April through June.

Observations along the Trinidad Head Line (41° 03.5' N):

Source: Eric Bjorkstedt (NMFS/HSU), Jeff Abell (HSU)

Recent observations along the Trinidad Head Line indicate continued evidence of mild upwelling into summer 2012, which is consistent with the persistence of southerly wind and rain events into July. Phytoplankton concentrations have remained low in early 2012, and so far the shelf waters off Trinidad Head appear to be less productive than has been observed in the early months of recent years.

Collection of the most recent data has been supported by NOAA/NMFS and the California Ocean Protection Council.

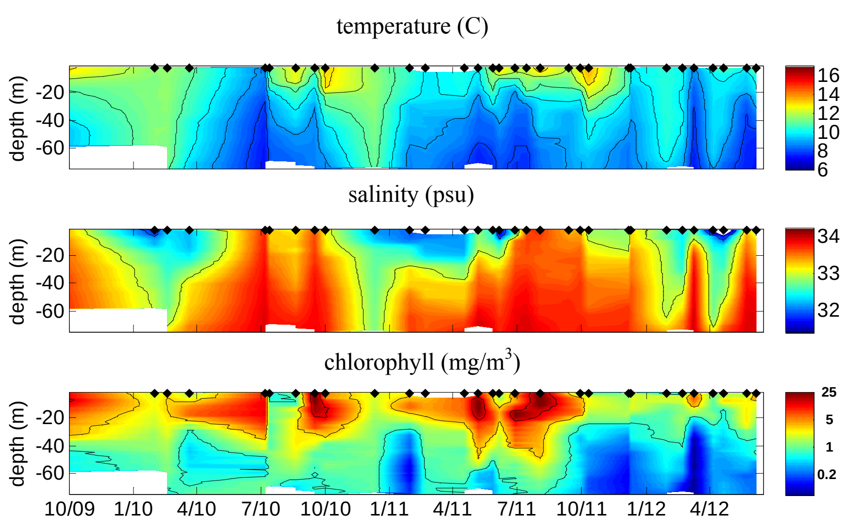


Figure 9. Hovmoller plots (time by depth) of temperature, salinity, and fluorescence (converted to chl a concentration per instrument settings) at station TH02 (41° 03.5' N, 124° 16' W, approximately 7 nm offshore, 75m depth at mid-shelf) along the Trinidad Head Line. Small diamonds along top of each plot indicate timing of each cruise; missing diamonds on the chlorophyll (fluorescence) plot indicate lack of data for two cruises in summer 2011 (14 July and 12 September). Interpolations between widely spaced points should be interpreted with greater caution.

Spring 2012 Observations by the SIO CalCOFI group:
Source: Ralf Goericke, SIO
The Spring 2012 CalCOFI cruise occurred relatively early in the year, from March 24th until April 7th, only ~40 days after the end of the winter cruise. However, the state of the system had changed appreciably. The average nitracline depth, i.e. the depth where concentrations of nitrate reach values of 1uM, was unusually shallow during the spring cruise (Figure 10). It was found a depth of 25 m; the long-term average for nitracline depth during the spring is 47 m. This shift in nitracline depth was at least partially the result of upwelling west and southwest of Pt. Conception where temperatures in the surface layer were less than 10 °C (Figure 11A). Concentrations of nitrate in these areas were correspondingly high, maximum values of 20 µM were observed in the center of the low temperature plume (Figure 11C). Surface layer Chl a, a proxy for phytoplankton biomass, was high only immediately off Pt. Conception (St. 80.55; Figure 11D); phytoplankton in other areas where nitrate was high had not yet responded. However, relatively high concentrations of Chl *a* were observed below the mixed layer in the areas where high Chl a had been observed during the winter 2012 cruise. These observations suggest that the system had already undergone at least one upwelling-bloom cycle prior to the spring cruise.
During the spring cruise unusually high abundances of gelatinous zooplankton were encountered. These patterns have not yet been quantified but it was noted by the seagoing technicians that have made net tows in the study area for over 25 years. Gelatinous zooplankton was most abundant north of Point Conception (CalCOFI Line 80) and in the offshore waters.

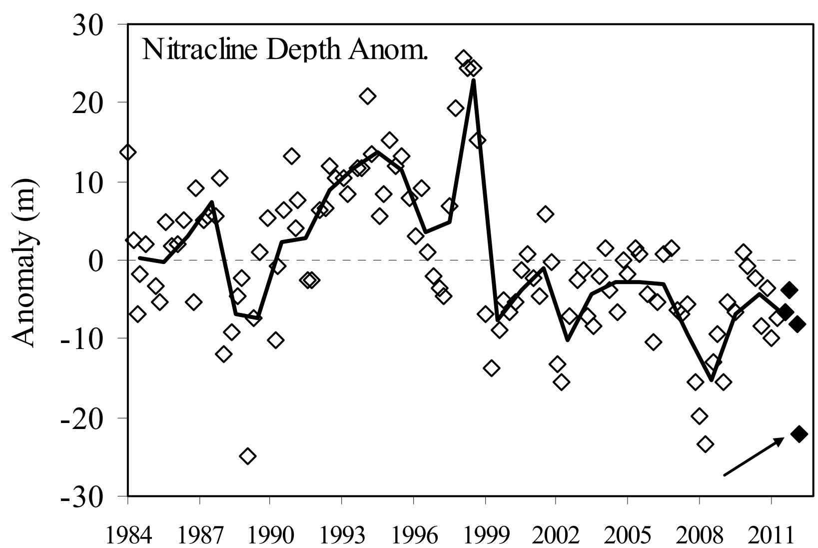


Figure 10. Average nitracline depth anomaly for the CalCOFI standard 66 station grid. Note that negative values represent nitracline depths that are closer to the surface than long-term averages. Data from individual CalCOFI cruise data are plotted as open diamonds. The solid line represent the annual averages, the dotted line the climatological mean, which in the case of anomalies is zero. The spring 2012 value is indicated using an arrow.

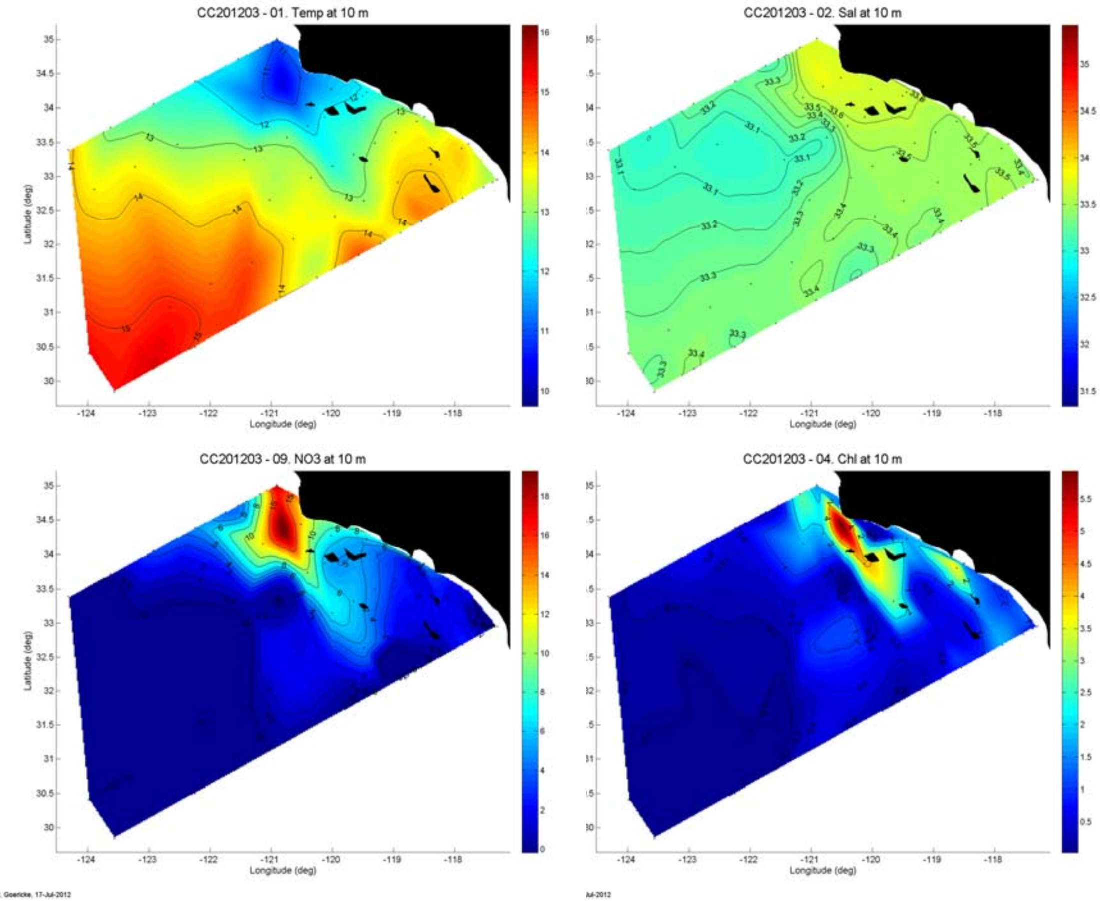


Figure 11. Hydrographic properties at a depth of 10 m off Southern California in Feb. 2012. Plotted are temperature (**A**, °C), salinity (**B**) and concentrations of nitrate (**C**, μM) and Chlorophyll a (**D**, μg/L).

ECOSYSTEMS

California Current Ecosystem Indicators:

<u>Copepod Biodiversity (Species Richness)</u>:

Source: Bill Peterson, NOAA, NMFS

Copepod species richness tracks closely the PDO and ONI such that when either index is negative, the copepod community is dominated by only a few sub-arctic species; conversely when either is positive, SSTs are warm and the copepod community is dominated by warm-water subtropical species. The sub-arctic ('northern') copepod species are believed to be a beneficial part of the food-web for many upper trophic-level species, such as salmon. In the first half of 2012, we have seen the highest abundances of 'northern' copepods measured over the last 17 years.

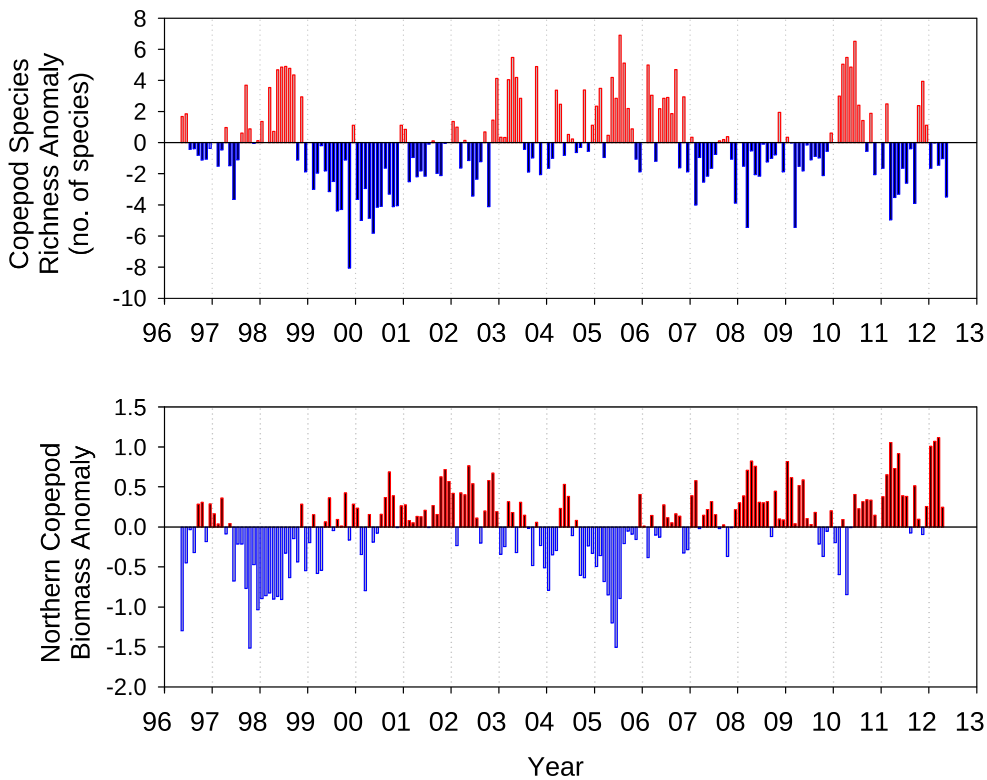


Figure 12. Time series of copepod biodiversity (top panel) and northern copepod biomass (bottom panel) from 1996 – present, taken from Newport Hydrographic (NH) line. The first half of 2012 has had the highest biomass of northern copepods in the last 17 years.

Ecosystem indicators for the Central California Coast, May-June 2012:

Source: John Field and Keith Sakuma, Fisheries Ecology Division, SWFSC

The Fisheries Ecology Division of the SWFSC has conducted an annual midwater trawl survey for juvenile rockfish and other pelagic micronekton along the Central California coast in late spring (May-June) since 1983. The survey targets pelagic juvenile (pelagic age 0) rockfish for fisheries oceanography studies and stock assessments, while simultaneously monitoring the micronekton forage assemblage (including other juvenile fishes, krill, coastal pelagic species, and mesopelagic species) and collecting oceanographic information. The results here summarize trends in the core area since 1990, as not all species were consistently identified in earlier (1983-1989) years of the survey. From 1983 through 2008 cruises took place on the NOAA ship David Starr Jordan, but since 2009 a series of different research platforms have been utilized and the surveys have ranged in duration and spatial distribution. In 2012 the cruise took place onboard the NOAA Ship Bell M. Shimada. The data for the 2012 survey presented here are preliminary, and the analysis does not account for potential differences in catchability among vessels. Results from the expanded survey area (available from 2004 to the present) will be developed for future reports.

The standardized anomalies from the log of mean catch rates are shown by year for six key forage species and assemblages that are sampled in this survey (Figure 13). Trends in 2011 and 2012 were of higher productivity for the species and assemblages that tend to do better with cool, high transport conditions, including juvenile rockfish, market squid and krill. In 2011, juvenile rockfish were more abundant then they had been since the early 2000s, and juvenile abundance remained relatively high in 2012. Market squid and krill were at above average levels in 2011, and very high levels in 2012; with market squid in particular estimated to be at the highest relative abundance in the time series. Other coastal pelagic species (adult northern anchovy and Pacific sardine) continued to be encountered at low levels, although this is likely a greater reflection of their local availability and ocean conditions rather than their coastwide or regional abundance. Notably, in 2012 the abundance of several types of gelatinous zooplankton was extraordinarily high, particularly that of several species of salps (pelagic tunicates), including *Salpa fusiformis* and *Thetys vagina*, as well as pyrosomes and heteropods. Although abundance data for these species has not been collected since 2001, a historical data set from the early years of the trawl survey will be evaluated in the near future to better quantify the relative magnitude of the observed abundance levels. The abundance was sufficiently great that the mass of gelatinous zooplankton damaged sampling gear, and resulted in some offshore trawl stations being abandoned for the first time in the 30 year history of this survey.

As with past reports, the trends observed in the six indicators shown in Figure 13 are consistent with trends across a broader suite of taxa within this region, with the first and second components (of a principle components analysis of 15 of the dominant taxon) explaining approximately 36% and 16% of the variance in the data respectively. Loadings of these groups indicate strong covariance among young-of-the-year groundfish (rockfish, sanddabs and Pacific hake), cephalopods and euphausiids, which in turn tend to be negatively correlated over time with coastal pelagic and mesopelagic species. As with the 2011 results, 2012 continued to indicate a pelagic micronekton community structure to conditions similar to those seen in the early 1990s and early 2000s (Figure 14). However, the spatial patterns of abundance will also be the target of future analysis, as anecdotally these patterns may not have been typical of previous cool, productive periods. Specifically, as there was some suggestion that small gelatinous zooplankton were at greater levels of abundance in offshore waters, while more coastal waters experienced relatively greater abundance levels of krill, squid and juvenile groundfish.

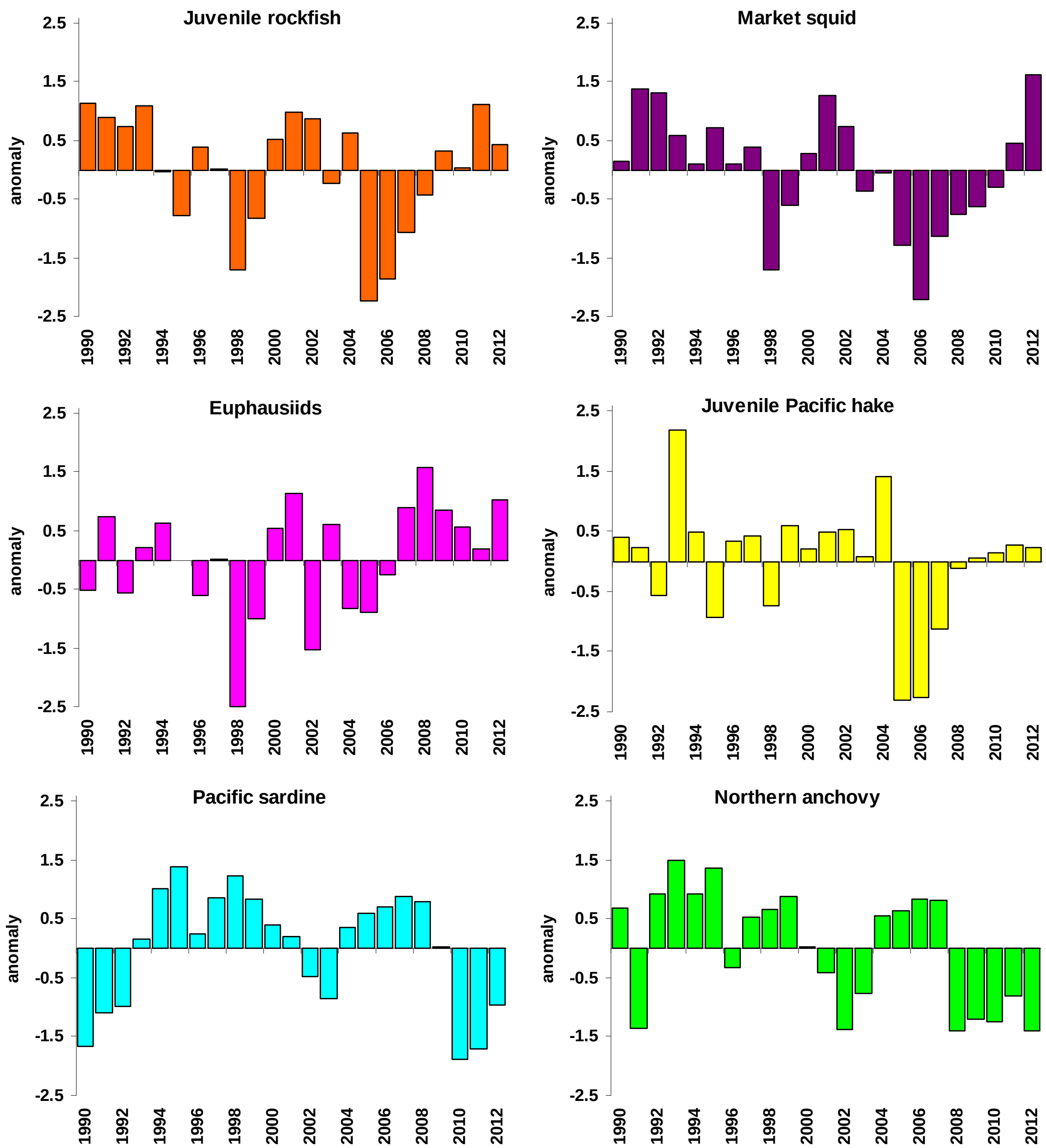


Figure 13. Long-term standardized anomalies of several of the most frequently encountered pelagic forage species from the central California rockfish recruitment survey in the core region (1990-2012).

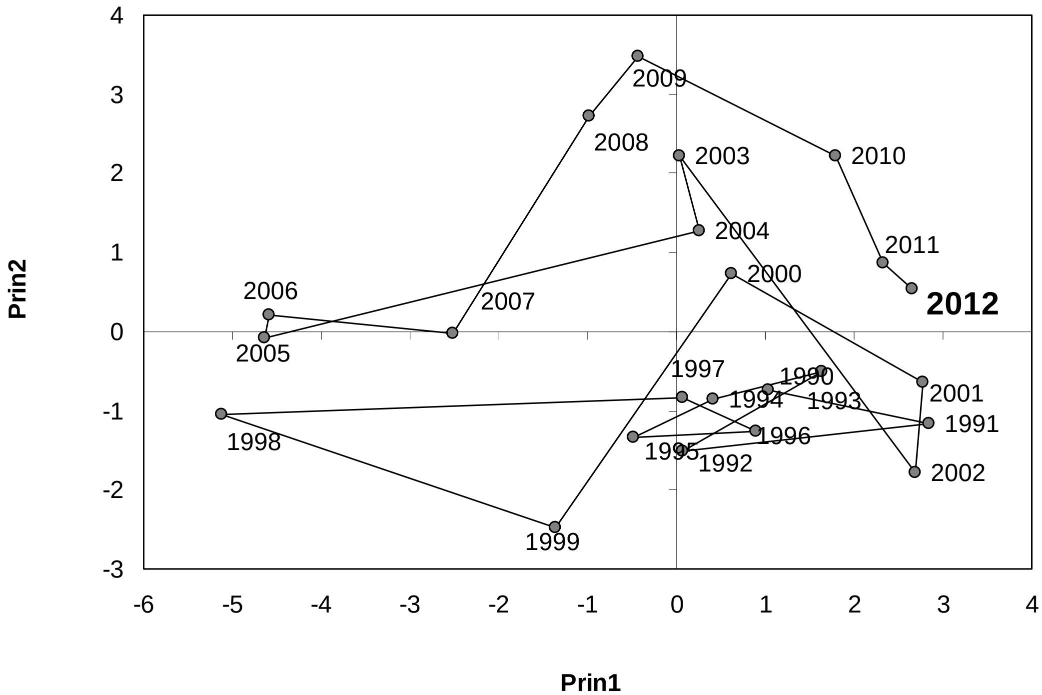


Figure 14. Principal component scores plotted in a phase graph for the fourteen most frequently encountered species groups sampled in the central California core area in the 1990-2012 period.

Salmon:

Source: Bill Peterson, NOAA, NMFS

Spring Chinook salmon returning to the Columbia River had a slow start this year, with only 39 adults counted by the end of March. Despite the slow start, overall return through May 31st was 158,000, which is slightly above the average for 1998 – present.

Of additional note, the return of sockeye salmon to the Columbia River is at a record high. Through the end of June over 401,000 had been counted at Bonneville Dam, compared to a 15 year average of 107,700. Annual return data can be found at http://www.cbr.washington.edu/dart/adult_annual.html.

West Coast Salmonids, Second Quarter, 2012:

Source: Jerrold Norton, NOAA, ERD, SWFSC (Jerrold.G.Norton@noaa.gov)

Recreational and commercial catches of fall-run Chinook salmon (*Oncorhynchus tshawytscha*), headed for the Sacramento River and other west coast drainages suggest good 2012 west coast river runs. Ocean catch of chinook and coho salmon (*Oncorhynchus kisutch*) has been about one fish per rod per day for boats out Oregon, Washington ports. Catch rates have been similar off California, where coho retention is illegal. However, there have been places and periods when recreational anglers have taken the California daily limit of two Chinook, near port, early in the day. Recreational anglers are paying more than $100 for a day's ocean fishing on Commercial Passenger Fishing Vessels operating out of San Francisco Bay ports.

Due to the abundance of chinook salmon in the coastal ocean and good fishing conditions for the northern California commercial fishery, the supply of fresh Chinook salmon has glutted markets and there has been a halving in dockside (exvessel) value to the fisher. Value dropped from $7.00 / lb early in May to $2.75 / lb early in July. Many commercial fishers stopped fishing to wait for the value of the fresh catch to improve. By mid-July the fish dealers agreed to an exvessel price of $3.50/ lb. Retail fish markets have been charging $10 – $25 / lb for fresh caught wild salmon. The 2012 commercial fishing season is relatively long and it follows complete commercial closures in 2008 and 2009 and much shorter seasons in 2010 and 2011. The markets may not be fully developed.

Recreational fisheries, mainly for fall-run chinook, opened on the Feather River and Sacramento Rivers on July 16. Fishing success depended on location. Each of these rivers also has fluctuating runs of spring run chinook. The spring run chinook in Butte Creek, a tributary to the Sacramento, supports the largest run of wild, naturally spawning spring run chinook in California. The Butte Creek run has been good with possibly 10,000 fish, after 4,500 in 2011 and about 2,000 fish in 2010. Spring chinook runs on the Trinity River, in northern California, have also been good during May and June.

Recreational angling for spring chinook is fair on the upper Rogue River in Oregon. By mid-July a total of 7,725 Spring chinook salmon had returned to Cole River Hatchery on the upper Rogue River, along with 839 summer steelhead (*Oncorhynchus mykiss*). This steelhead return is the best since the 1980s. Sea-run cutthroat trout (*Oncorhynchus clarkii*) are also being taken from Oregon Rivers. By mid-July the Winchester counting station on the North Umpqua River in Oregon has registered 7,000 Spring chinook. The tally of winter steelhead reached 13,700 fish at Winchester. This is the highest total since the 2003-04 season when 14,507 winter steelhead were counted. Totals for 2003-2004 and 2011-2012 exceeded all other (1945-2011) winter steelhead totals for this location. Cumulative spring-summer chinook run totals at Bonneville Dam on the Columbia River were about equal to the 10-year average by mid-July 2011 and 2012. However, the 2012 sockeye salmon (*Oncorhynchus nerka*) cumulative total of more than 500,000 fish has been phenomenal for the lower Columbia River, exceeding all totals since the late 1930s. The number of Lake Washington sockeye migrating through Ballard Locks totaled 130,000 fish by mid-July, exceeding predicted returns. Fraser River sockeye runs are predicted to be below historical average returns at about a million fish.

Harmful Algal Blooms:

This section provides a summary of two toxin-producing phytoplankton species *Pseudo-nitzschia* and *Alexandrium* activity. *Alexandrium* is the dinoflagellate that produces a toxin called paralytic shellfish poisoning (PSP), and *Pseudo-nitzschia* is the diatom that produces domoic acid.

Washington HAB Summary

Washington's Olympic Region Harmful Algal Bloom (ORHAB) partnership monitors nine regular sites along Washington's outer coast for the presence of harmful phytoplankton species weekly. No second quarter 2012 summary was available at the time of this report. Please view the site http://ww4.doh.wa.gov/gis/mogifs/biotoxin.htm for the most current status.

Oregon HAB Summary

Source: Oregon Department of Fish and Wildlife http://www.dfw.state.or.us/MRP/shellfish/razorclams/plankton.asp
Source: Zach Forster, Oregon Department of Fish and Wildlife
Oregon's "Monitoring Oregon's Coastal Harmful Algae (MOCHA) project" samples ten sites along the coast of Oregon for the presence of harmful algae. These sites include three along Clatsop Beach, one on Cannon Beach, two on the central coast and four sites on the south coast.

Phytoplankton observations showed an increase in species diversity among the nearshore community starting in May. Throughout May, June and July only very small accumulations of *Pseudo-nitzschia* were detected coast wide. Domoic acid levels in shellfish tissue remained undetectable during the time of this report.

Alexandrium was first observed in net tow samples along the northern and central Oregon coast at the beginning of June. Epi-flouresence microscopy confirmed the presence of multiple species of *Alexandrium* in samples collected from Clatsop, Cannon and Agate beaches. As favorable conditions persisted through much of June, *Alexandrium* cells were observed in 10x concentrated whole water samples from the Columbia River south jetty to as far south as Newport. By July, the bloom seemed to have peaked resulting in increased levels of paralytic shellfish toxins. On July 6, 2012, the Oregon Department of Agriculture reported toxin concentrations in mussels exceeded regulatory closure levels and subsequently the fishery from the Tillamook Head south to Heceta Head was closed.

Sampling in June and July also captured other potentially harmful algae including; *Dinophysis spp.*, *Akashiwo sanguinea* and *Heterosigma akashiwo*.

California HAB Summary

Source: http://www.cdph.ca.gov/healthinfo/environhealth/water/Pages/Shellfish.aspx

Domoic Acid Update: *Pseudo-nitzschia* was observed along the entire southern California coast and at several sites along the northern California coast during the months of April and May. *Pseudo-nitzschia* was observed at San Luis Obispo and Morro Bay sites the last weeks of June. Domoic acid was not detected in any shellfish samples collected during the months of April and May. However, a very low concentration was detected in one of several rock crab samples collected from Santa Rosa Island on May 28. Domoic acid concentrations in shellfish increased from non-detectable levels mid-June to above alert level late-June in outer Morro Bay.

Paralytic Shellfish Poisoning (PSP) Update: *Alexandrium* was observed at a number of sites during April and May, and was not observed at any sites during early June. A low concentration of PSP toxins were detected in sentinel mussels from Drakes Estero early in April. PSP toxins were not detected in any bivalve shellfish samples during May and early June.

PACIFIC COAST FISHERIES MANAGEMENT SUMMARIES AND RECOMMENDATIONS

Coastal Pelagics:

Second Quarter 2012 Summary, CA Pacific mackerel and Pacific sardine fisheries:

Monthly CPS landings tables can be found on the web at www.dfg.ca.gov/marine/cpshms/landings.asp.

On November 4, 2011 the Pacific Fisheries Management Council adopted a coastwide harvest guideline (HG) of 109,409 mt for the 2012 Pacific sardine fishery. Subtracting a Tribal Set Aside of up to 9,000 mt and an Exempted Fishing Permit (EFP) set aside of up to 3,000 mt provides at least 97,409 mt for the non-tribal general fishery which is allocated seasonally as follows:

Coastwide HG = 109,409 mt Tribal set aside = 9,000 mt EFP set aside = 3,000 mt Adjusted HG = 97,409 mt				
	Period 1	Period 2	Period 3	Total
	Jan 1 - June 30	July 1 - Sept 14	Sept 15 - Dec 31	
Seasonal Allocation (mt)	34,093	38,964	24,352	97,409
Incidental Set Aside (mt)	1,000	1,000	1,000	3,000
Adjusted Allocation (mt)	33,093	37,964	23,352	94,409

Pacific sardine landings in California remained slow during the second quarter of 2012. By the end of June 2012 the CA fleet had caught 15,386 mt (46% of the adjusted coastwide allocation of 33,093 mt). During the last few weeks of June both the Oregon and Washington fleets began to land sardines. By June 30 coastwide landings total was 21,032 mt. The uncaught remainder of the 1st allocation and the incidental set aside were added to the 2nd allocation for a new adjusted seasonal allocation of 51,025 mt.

2012	PACIFIC MACKEREL (mt)			PACIFIC SARDINE (mt)		
	No. Cal	So. CA	TOTAL	No. Cal	So. CA	TOTAL
April	0	135	135	0	688	688
May	0	299	299	0	2,534	2,534
June	0	108	108	0	1,700	1,700
TOTAL	0	542	542	0	4,922	4,922

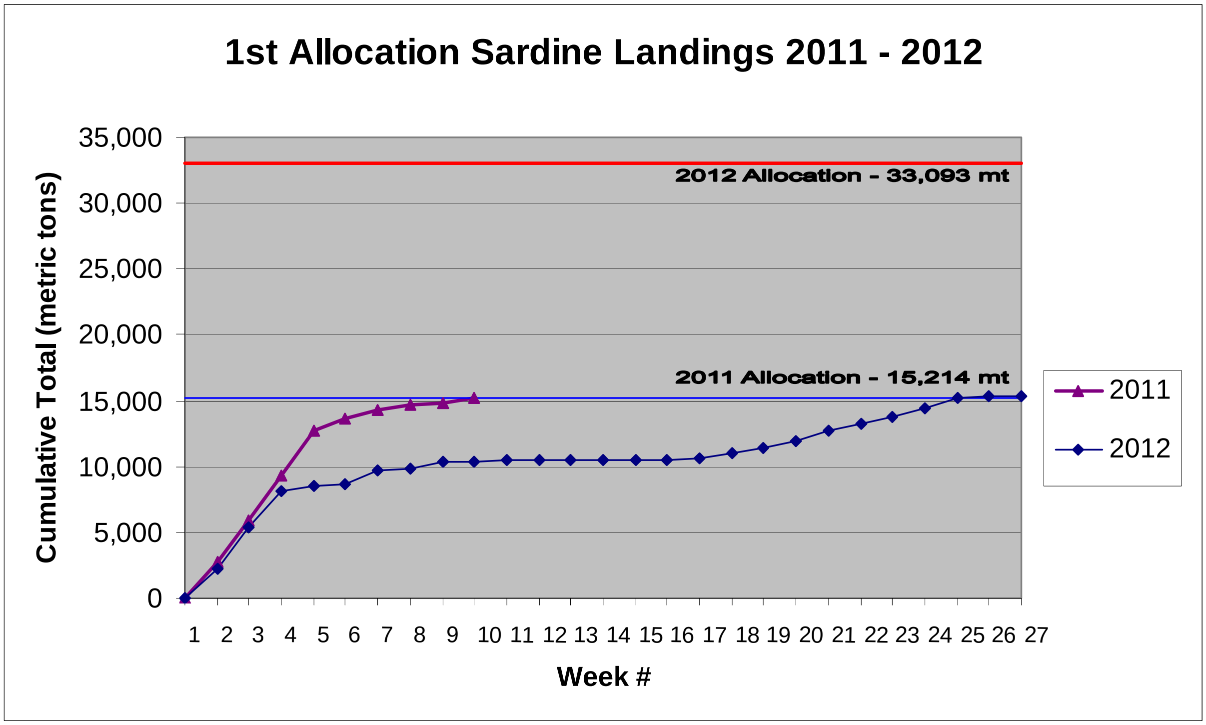


Figure 15. This graph compares weekly sardine landings during the first allocation period 2011-2012.

California Coastal Pelagic Fisheries 2012:
Source: Jerrold Norton, NOAA, ERD, SWFSC (Jerrold.G.Norton@noaa.gov)
California commercial landings of Pacific Mackerel were 100 – 300 metric tons (mt) in the second quarter of 2012 for an annual total of 919 mt. Jack Mackerel landings were lower and totaled 33 mt for the year. Pacific sardines were landed in April, May and June for a total of 15,467 mt during 2012. There were some sardines taken off Monterey early in 2012, but the majority of the landings have been in Southern California ports. Pacific sardines are also landed in Oregon and Washington ports. Northern Anchovy were taken in small amounts and landed in Monterey Bay area ports. The total California anchovy landings for the year are 2,376 mt. The commercial 2012-13 Market Squid season opened in April, but there was little catch until June when 1,363 mt were landed in southern California ports.