

WASHINGTON COMMON MURRE COLONY SURVEYS 1996

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## INTRODUCTION

Washington Common Murre colonies on National Wildlife Refuges have been censused annually since 1979. The data show that, although the species was relatively abundant on offshore rocks and islands prior to 1983, murre colony attendance along the Washington outer coast refuge colonies has severely declined since then (Wilson 1991). ENSO events, oil spills, drowning by gill nets, and Navy bombing of breeding islands have been suspected as causes for the decline, but the data are too few to identify the reasons for the continued low murre use of refuge islands and rocks in Washington. The Common Murre was the most frequent victim of several oil spills, including the recent Tenyo Maru spill that occurred off the entrance of the Strait of Juan de Fuca. Funds for restoring seabirds killed by this spill are now available. In order to provide needed additional information on Washington Common Murre colony attendance and breeding chronology, a pilot project for expanded murre colony surveys was authorized to aid in restoration planning. This report summarizes the findings of murre colony surveys along the Washington coast for the 1996 breeding season.

## METHODS

All known murre colony sites were surveyed from a Hughes 500D helicopter, chartered from Eagle Air Helicopters in Forks WA, with the passenger side door removed. While hovering around or over the colonies at an altitude of 70 - 250 m the colonies were photographed with a Canon EOS A2 35 mm camera equipped with a Canon EF 70-200 mm f/2.8 L lens. Film was Kodak Ektachrome 400 ASA Elite. The surveys were flown on June 17 and 28, and on July 12

and August 1. The colonies were surveyed between 09:00 and 14:00 hrs. Because of heavy rain and dense fog, White Rock and Tatoosh Island were not surveyed on August 1. The number of murres were estimated by counting the number of birds from the slides. For this purpose the transparencies were projected on to a paper flip chart. Small groups of murres (<30) were circled with a blue marker and then counted with a tally counter. This was repeated until the entire colony was counted. When murres were densely packed, or when the resolution of the slides was poor so that individual murres were impossible to distinguish, the number of birds within the small circled groups were estimated as well as possible. This method is identical to the one used by this author to estimate murres on the Washington coast during 1979-1982, and during 1987 when they were more abundant. The original slides were submitted with this report to the U.S. Fish and Wildlife Service Western Washington Office in Lacey, WA. To provide some documentation of sea surface temperatures along the Washington outer coast, along with an interpretation of how these data relate to El Nino, I have provided in Appendix 1, copies of the 1996 monthly El Nino advisories, produced by the National Marine Fisheries Service.

## RESULTS AND DISCUSSION

During the 1996 census period between 6070 and 7405 murres were counted on refuge rocks and islands (Table 1). With the exception of the July 12 survey, the 1996 refuge counts were higher than comparable estimates in 1995. Overall, 22 percent more murres were counted within the refuge this season compared to last year. This increase was mainly because more

murre used Big Stack, Table Rock and Carroll Island colonies. In contrast, fewer murre were counted during two of the three surveys of Tatoosh Island and its surrounding rocks. Overall, 41 percent fewer murre were recorded at these colonies in 1996 than in 1995. No chicks were observed during any of the 1996 aerial surveys.

This year's results are difficult to interpret in view of the reported colony abandonment in Oregon (Roy Lowe personal communications), and because no chicks were observed on any of the Washington colonies. According to monthly El Nino advisories issued by the National Marine Fisheries Service (Appendix 1), sea surface temperatures off the Washington coast were above normal during the critical period from January through June of 1996. This warming was apparently because of local meteorological conditions and was not ENSO related since wind and sea surface temperature analysis along the equator showed no indication of El Nino conditions. Murre counted on Washington outer coast refuge colonies may have experienced lower reproductive success because of this warming episode. Why more birds were counted in 1996 compared to 1995 is unclear, perhaps some of Washington's refuge colonies are used during some years mostly for roosting.

#### ACKNOWLEDGMENTS

Funding for the first, third and fourth survey was obtained from the Tenyo Maru Oil Spill settlement. I wish to thank the TMOS trustees for approving this pilot project. The third survey was funded by the Nisqually National Wildlife Refuge Complex. I am grateful for the continued support of Refuge Managers Bill Hesselbart and Jean Takekawa. Ken Warheit provided comments on an earlier version of this report.

## LITERATURE CITED

- Wilson, U. W. 1991. Responses of three seabird species to El Nino events and other warm episodes on the Washington coast, 1979-1990. *Condor* 93:853-858.

**Table 1**

**COMMON MURRE COLONY SURVEYS, WASHINGTON OUTER COAST 1996**  
(No. of birds)

Isl. No.	Island Name	Survey Dates			
		6-17	6-28	7-12	8-01
586	Erin	30	10	80	215
585	Erin's Bride	95	10	50	40
575	Grenville Arch	120	5	0	65
570	Big Stack	725	805	1080	1205
529	Willoughby Isl.	0	0	15	190
531	Split Rock	0	5	35	320
483	Destruction Isl.	0	0	0	0
458	Middle Rock	0	0	0	0
409	Rounded Isl.	0	0	0	0
363	Table Rock	0	265	245	195
361A	Cakesosta	1125	1135	775	915
361	Huntington Isl.	2355	2280	1985	1795
357/358	No Name	35	230	115	90
333	Gunsight Rock	60	0	50	40
332	Petrel Isl.	0	0	0	15
256	Jagged Isl.	0	0	0	0
269	Carroll Pillar	195	340	255	150
262	Carroll Isl.	1415	1575	1280	2170
192	White Rock	75	60	105	NS
023	Tatoosh Rock	0	0	0	NS
022	Tatoosh Rock	65	20	25	NS
038	Tatoosh Rock	0	0	20	NS
035	Tatoosh Rock	205	160	10	NS
021	Tatoosh Isl.	355	560	275	NS
Total No. murre on coast:		6855	7460	6400	IS
No. within refuge:		6230	6720	6070	7405
No. at Tatoosh Island:		625	740	330	NS
Percent within refuge:		91 %	90 %	95 %	IS

IS = incomplete survey  
NS = not surveyed

## **APPENDIX 1**

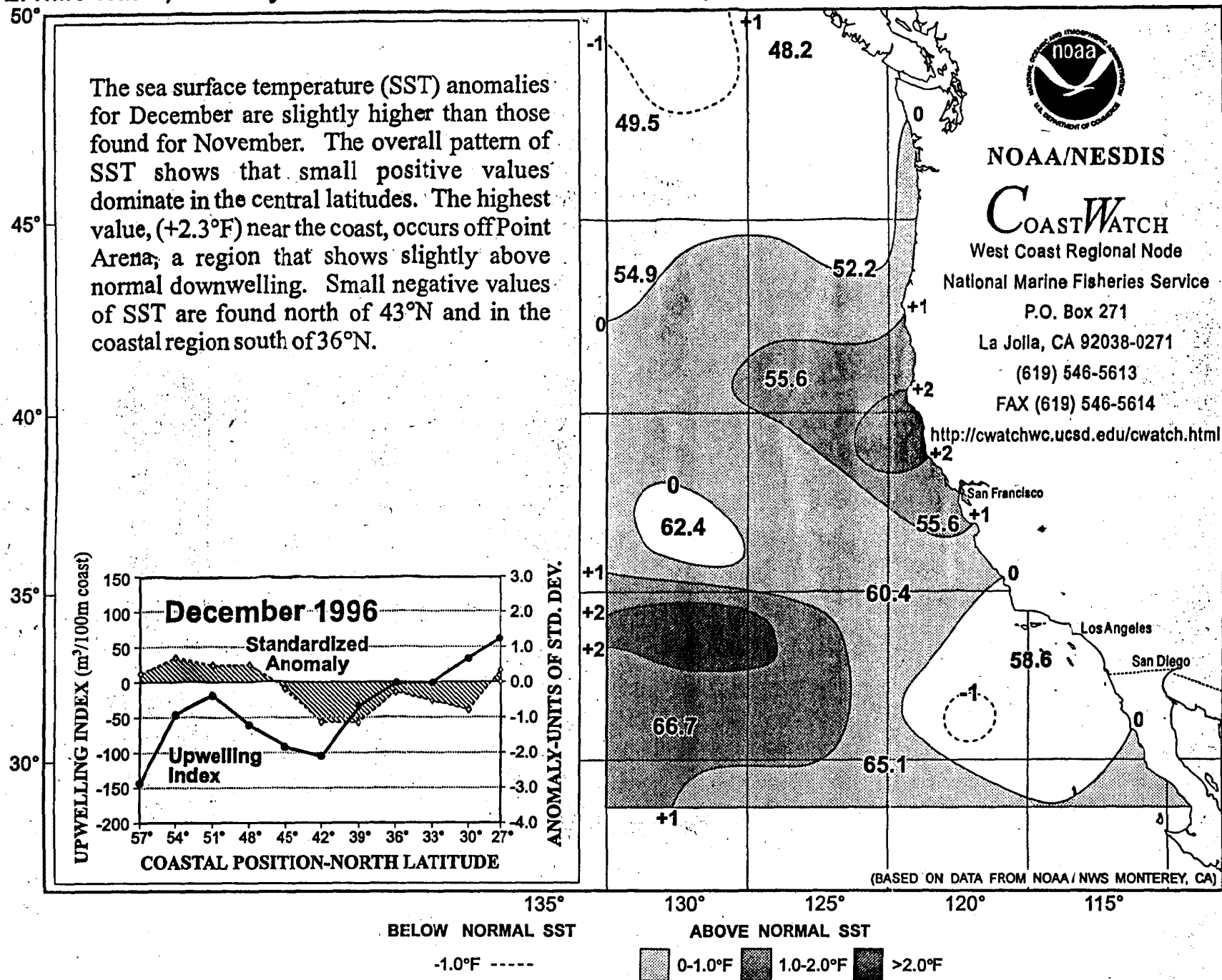
**1996 Monthly El Nino Watch Advisories**

**Produced by**

**National Marine Fisheries Service**

**P.O. Box 271, La Jolla, CA 92038**

# El Niño Watch, Advisory no. 96-12. Coastal Ocean Mean SST(°F) and Deviation From Normal, December 1996.





# El Niño Watch, Advisory no. 96-11. Coastal Ocean Mean SST(°F) and Deviation From Normal, November 1996.

50°

Sea surface temperature (SST) anomalies in November were lower than those observed in October. There was a slight reduction of about 1°F in the anomaly values off the Pacific Northwest and central California, while anomaly values off of southern California and northern Baja California, Mexico dropped by 3°F. The resultant picture is one of virtually normal SST's off the entire west coast of the U.S. during November. The slightly above normal upwelling observed along the entire U.S. west coast supports the premise that surface mixing due to winds combined with coastal upwelling was instrumental in reducing the SST anomalies.

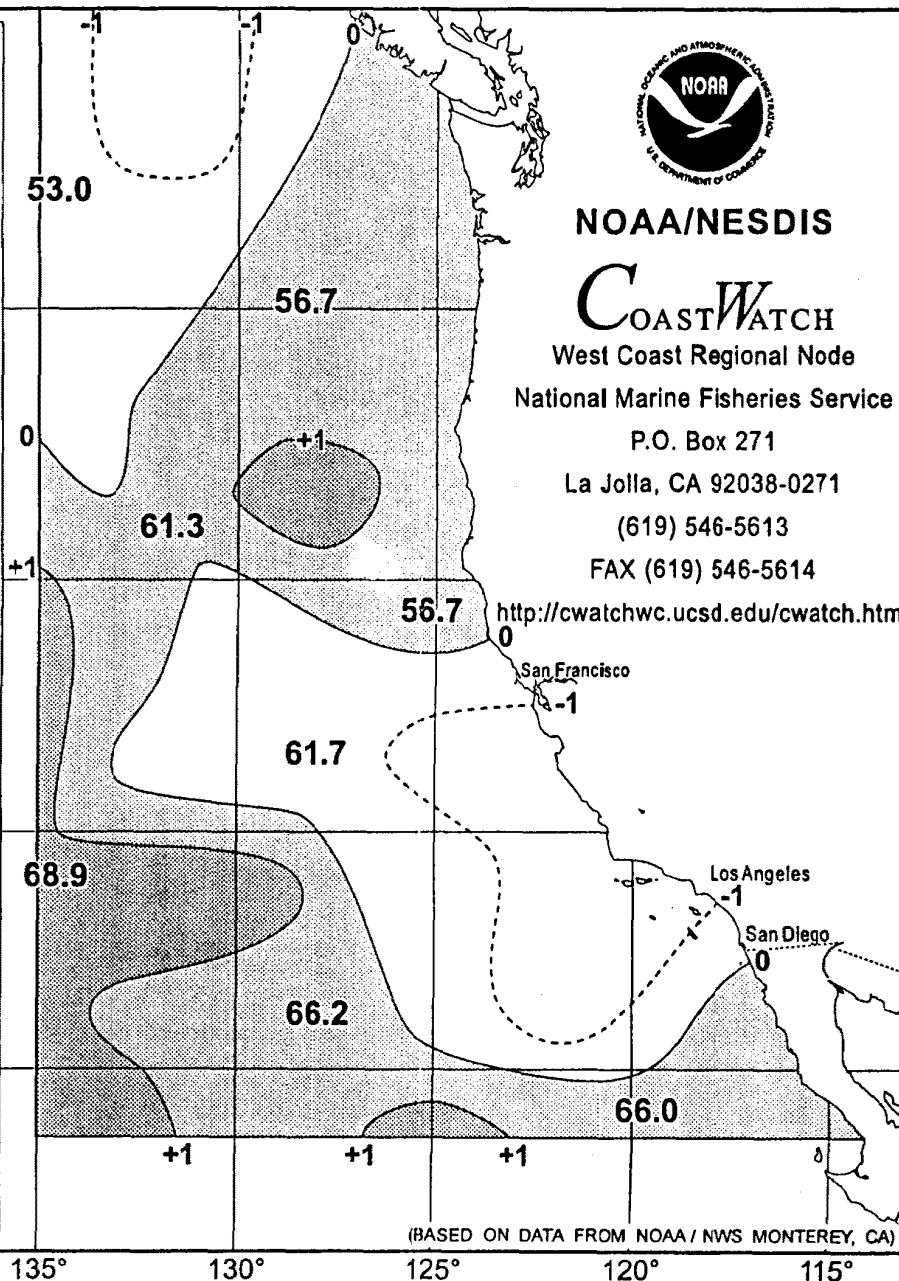
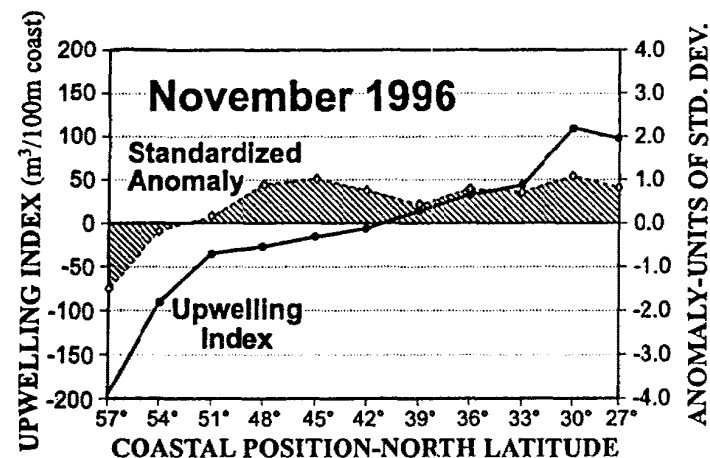
45°

40°

The Southern Oscillation Index in November was slightly negative. Equatorial SST's remain below normal, particularly off the coast of South America. Conditions in the equatorial region are expected to remain near normal over the next few months.

35°

30°



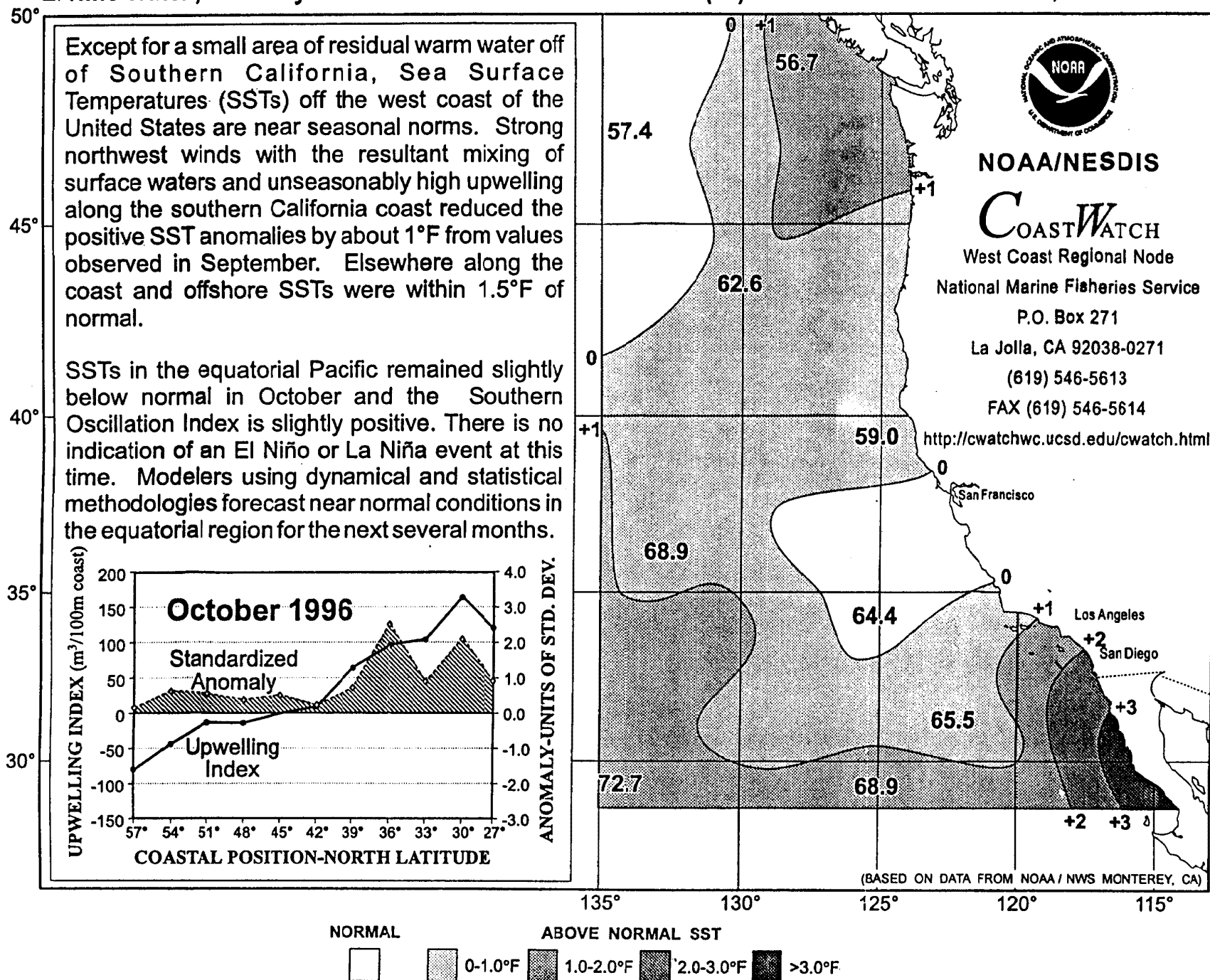
ABOVE NORMAL SST



BELOW NORMAL SST

----- -1.0°F

# El Niño Watch, Advisory no. 96-10. Coastal Ocean Mean SST(°F) and Deviation From Normal, October 1996.



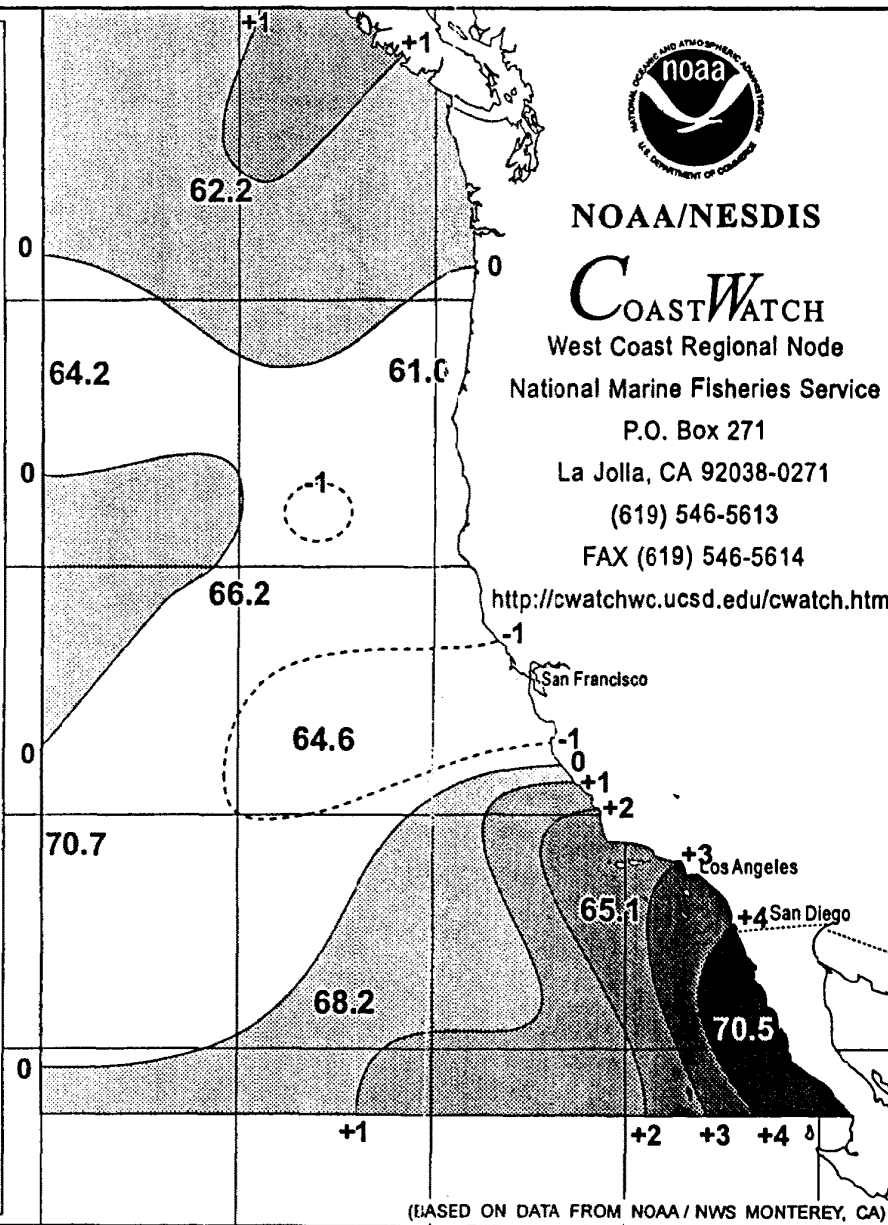
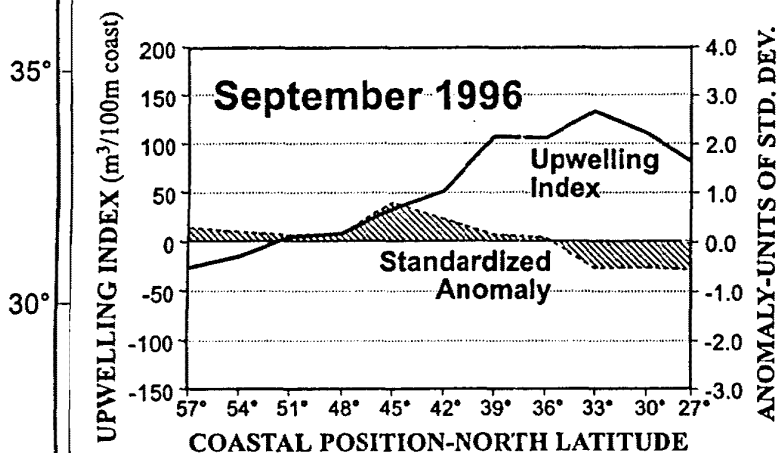
# El Niño Watch, Advisory no. 96-9. Coastal Ocean Mean SST(°F) and Deviation From Normal, September 1996.

50°

The Sea Surface Temperatures (SST) for waters off the west coast of the U.S. continued to be near their seasonal norms as they were in August. SST anomalies continued to be plus or minus 1.5°F from Point Conception northward to Vancouver Island. The strong positive anomalies which have persisted within the Southern California Bight and off upper Baja California, Mexico were still apparent although slightly lower than August values, ranging from 2°F 200 miles offshore to over 4°F alongshore Baja California. Seasonal upwelling values were normal along the entire west coast in September.

The Southern Oscillation Index continues to be slightly positive and SST's in the equatorial Eastern Pacific remain slightly below normal. Models using both dynamical and statistical methods which are used to forecast trends in the SOI and predict El Niño events do not indicate any trends towards an El Niño event in the next several months.

View the Advisory, and back issues to 1993, in color at our web site: "<http://cwatchwc.ucsd.edu/cwatch.html>."



NORMAL



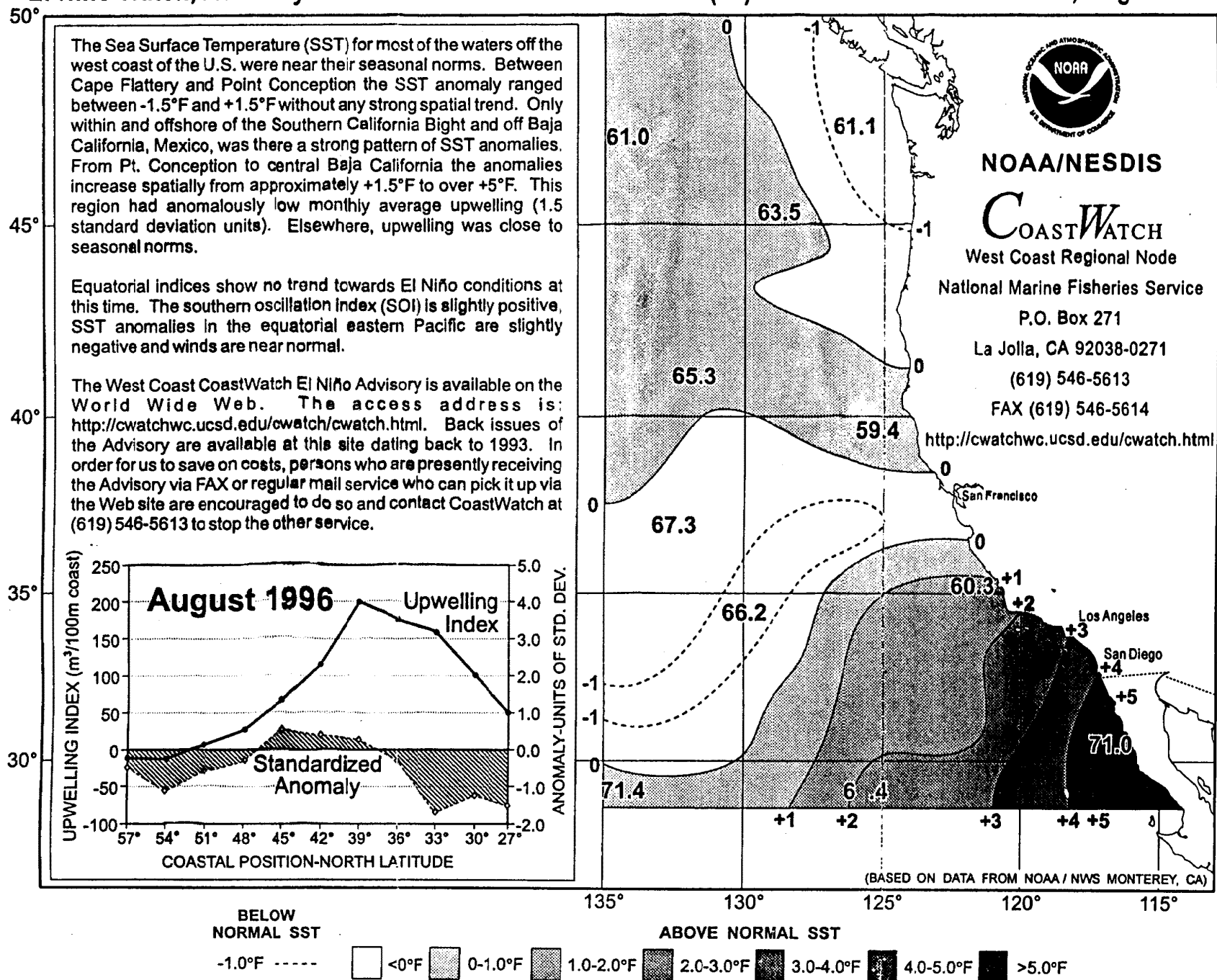
ABOVE NORMAL SST



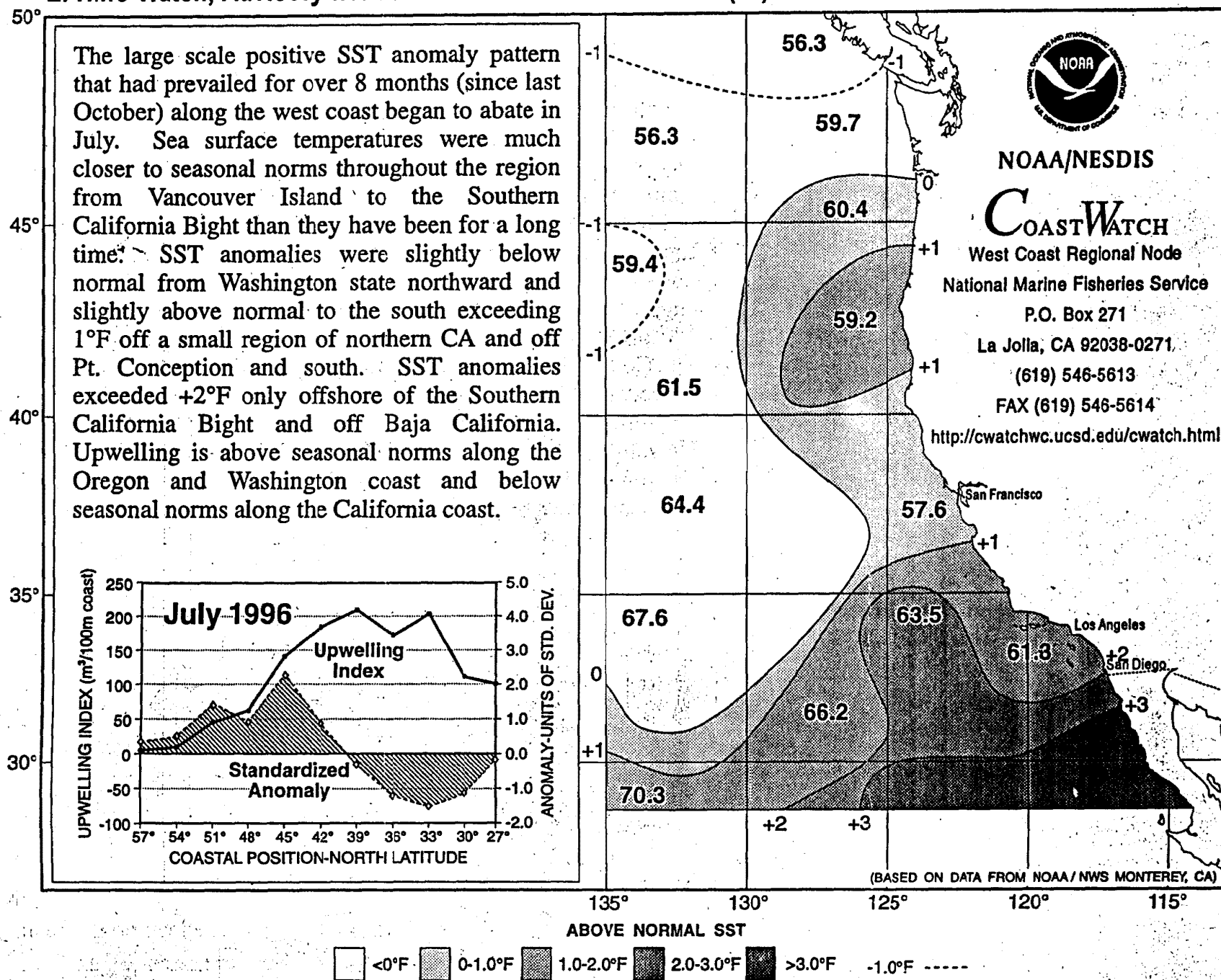
BELOW NORMAL SST

-1.0°F -----

# El Niño Watch, Advisory no. 96-7. Coastal Ocean Mean SST(°F) and Deviation From Normal, August 1996.



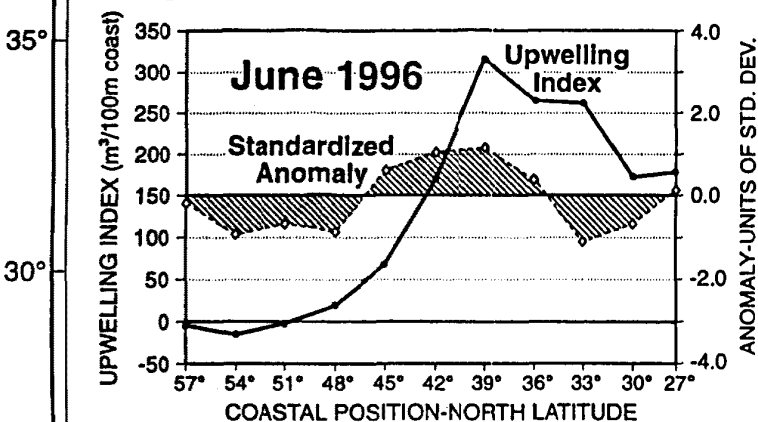
# El Niño Watch, Advisory no. 96-7. Coastal Ocean Mean SST(°F) and Deviation From Normal, July 1996.



# El Niño Watch, Advisory no. 96-6. Coastal Ocean Mean SST(°F) and Deviation From Normal, June 1996.

50°

In June the sea surface temperature (SST) anomalies off of the U.S. west coast continued to be positive. There was very little change in SST anomalies from Cape Mendocino northward to Vancouver Island as SST's remained 1°-2°F above normal in coastal waters and near normal beyond 300 miles offshore. Off central and southern California there was a reduction of the positive SST anomalies in June of about 2°F from values observed in May. SSTs are normal in coastal waters off San Francisco with an increasing positive anomaly observed as you move southward, reaching 4°F above normal off northern Baja California. The upwelling indices provided by PFEG, Monterey show normal upwelling conditions in June along the entire U.S. west coast. Upwelling and surface mixing of waters from San Francisco southward are the likely cause of the decrease observed in the positive SST anomalies over this region. The Southern Oscillation Index for equatorial waters was positive in June indicating that conditions for an El Niño event have not developed at this time.



52.3

56.8

61.4

67.5

68.7

60.6

63.7

66.7



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San Diego

(BASED ON DATA FROM NOAA/NWS MONTEREY, CA)

ABOVE NORMAL SST



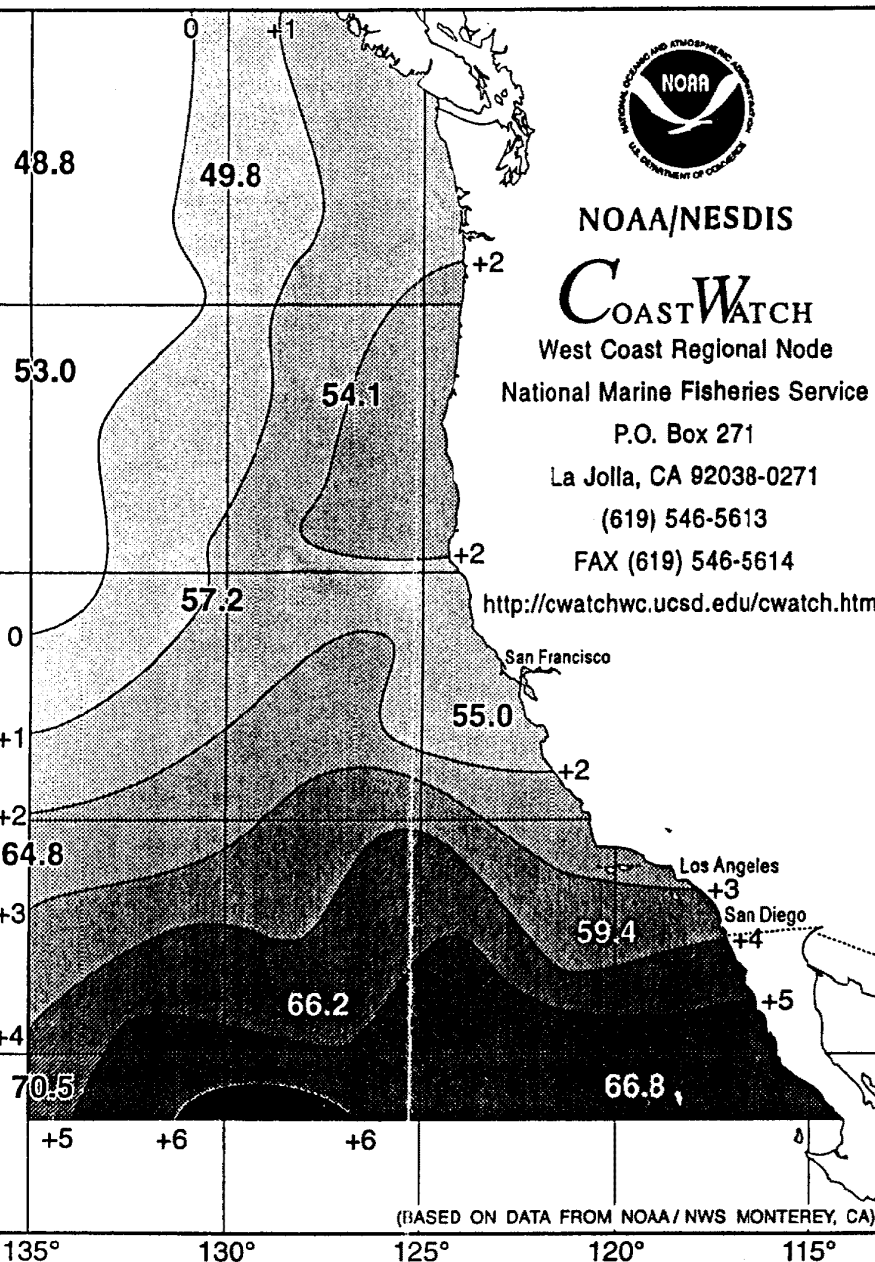
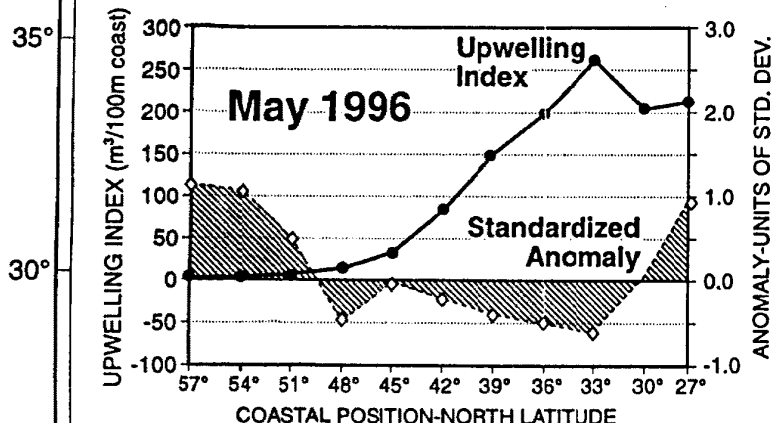


# El Niño Watch, Advisory no. 96-5. Coastal Ocean Mean SST(°F) and Deviation From Normal, May 1996.

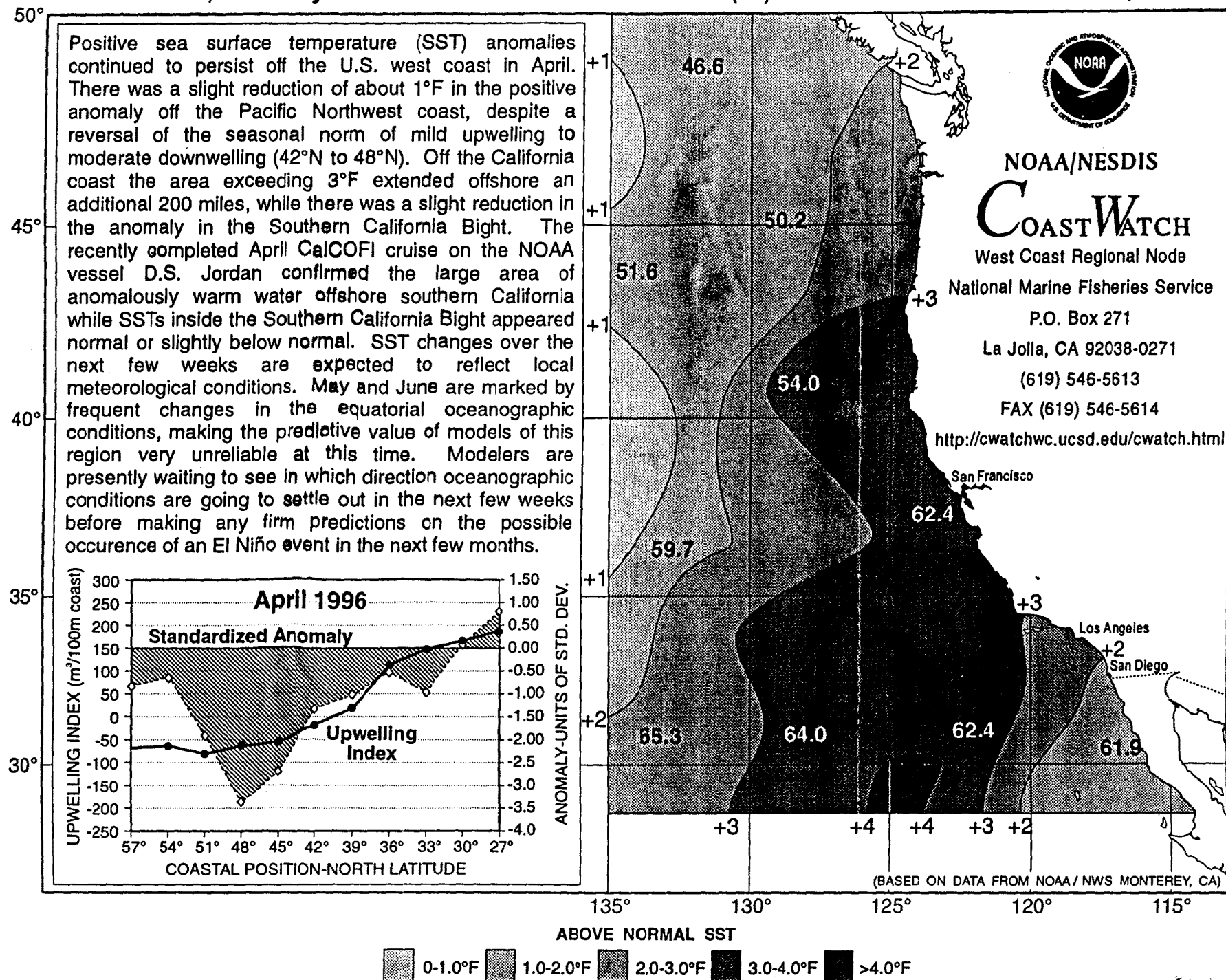
50°

The sea surface temperature (SST) anomalies off the U.S. west coast in May continued the trend observed during April. Positive anomalies off the Pacific Northwest coast decreased by about 1°F, remaining slightly above normal near the coast and very near normal beyond 300 miles offshore. This overall 1°F reduction in the observed positive SST anomalies continued southward to Pt. Conception, reversing the trend of increasing positive anomalies observed in April off of northern and central California. There was considerable increase in the positive SST anomalies observed off southern California, from the coast to 800 miles offshore. Positive SST anomalies increased 1°-3°F from Pt. Conception to upper Baja California, Mexico, with the greatest increase observed in the southern regions. The upwelling index provided by PFEG, Monterey indicates that upwelling was very near normal along the entire west coast. Analysis of winds and SSTs along the equator show no indication of El Niño type conditions beginning at this time. Local meteorological conditions continue to provide the greatest influence on SST conditions and local cooling and warming trends.

Please note that there was an error in the April Advisory 96-4. The average SST off San Francisco which was shown as 62.4°F should have been 55.8°F.



# El Niño Watch, Advisory no. 96-4. Coastal Ocean Mean SST(°F) and Deviation From Normal, April 1996.





# El Niño Watch, Advisory no. 96-3. Coastal Ocean Mean SST(°F) and Deviation From Normal, March 1996.

50°

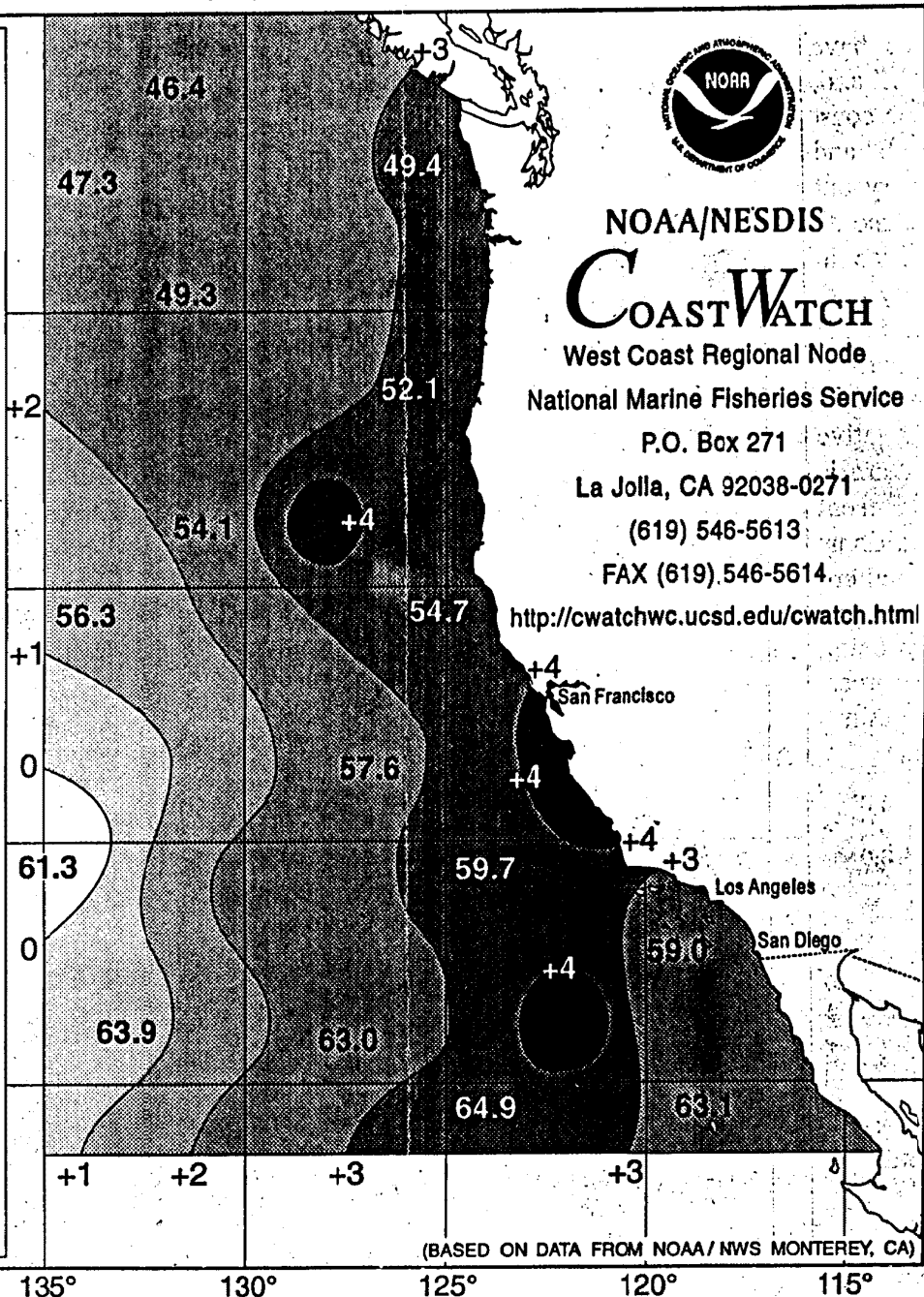
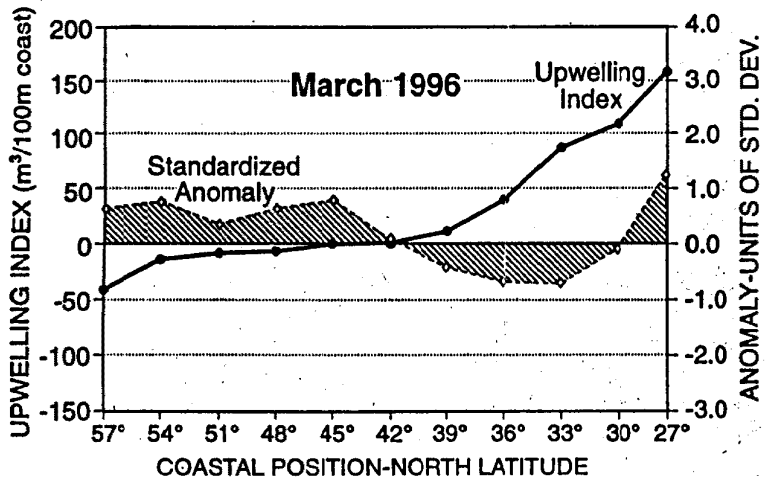
Positive sea surface temperature (SST) anomalies have dominated the waters off the west coast since last fall and, in particular, have exceeded 2°F in regions along the coast since last December. In March the areas exceeding 3° and 4°F have diminished from those shown for February but otherwise a similar pattern persists. As stated last month the speculation is that in large part this persistence in positive SST's is related to decreased storm activity and, hence, reduced mixing. On a larger scale (as given in the NOAA/ NWS Climate Diagnostics Bulletin) the pattern of positive SST anomalies covers most of the eastern temperate North Pacific. There is a large body of negative anomalies in the central North Pacific. Such a pattern is reminiscent of northern El Niño conditions but at present the equatorial zone is experiencing the opposite conditions; equatorial SST's are below normal and the southern oscillation index is neutral. This new pattern interests climate scientists and apparently some headway is being made in modeling and understanding the driving forces. For the most part the coastal upwelling index is within a fraction of one standard deviation of seasonal norms.

45°

40°

35°

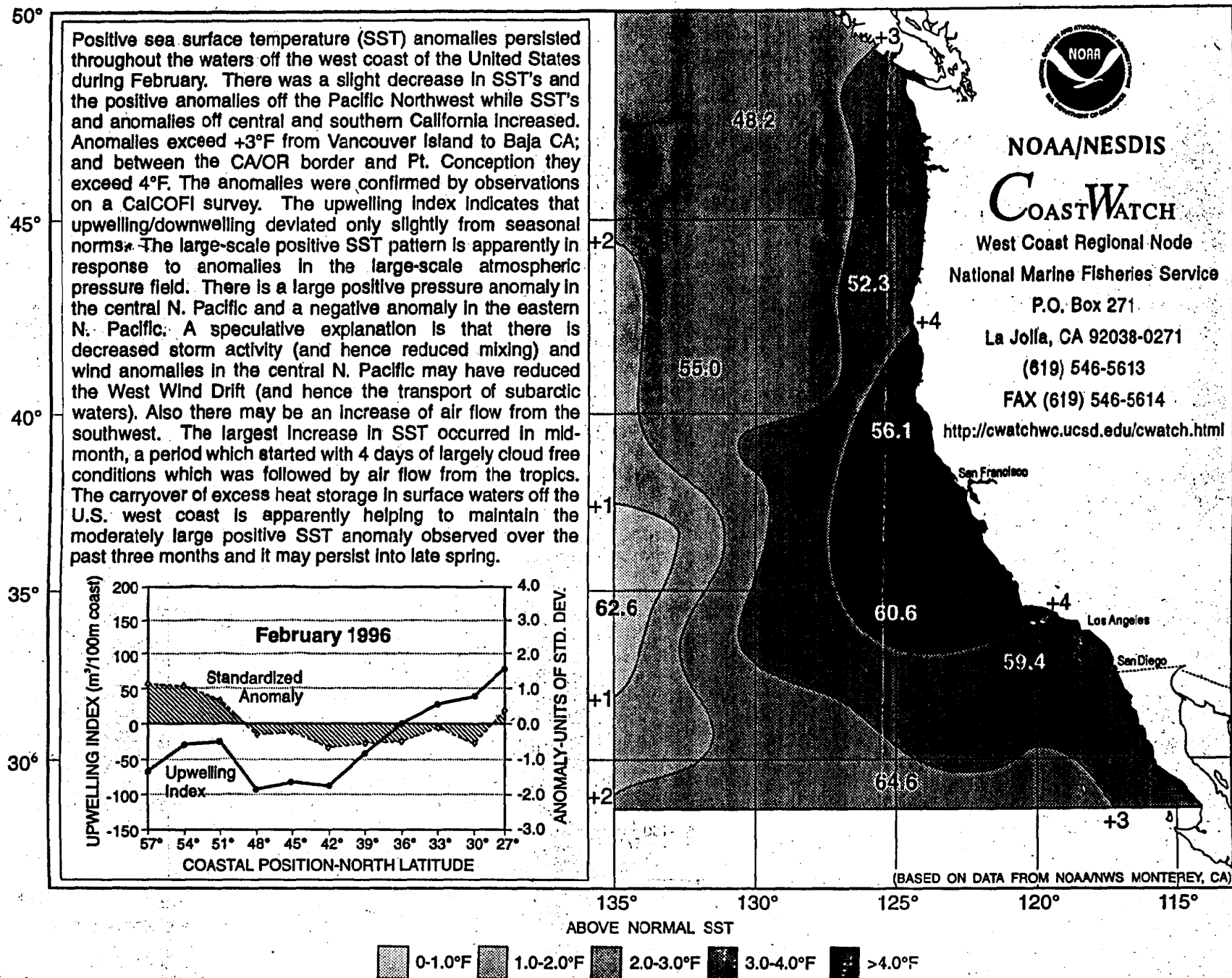
30°



ABOVE NORMAL SST



# El Niño Watch, Advisory no. 96-2. Coastal Ocean Mean SST(°F) and Deviation From Normal, February 1996



# El Niño Watch, Advisory no. 96-1. Coastal Ocean Mean SST(°F) and Deviation From Normal, January 1996

