

Soundings



American Cetacean Society- Monterey Bay Chapter

April 2012

PO Box H E, Pacific Grove, CA 93950

AMERICAN CETACEAN SOCIETY- MONTEREY BAY CHAPTER

Monthly meeting at **Hopkins Marine Station**, Lecture Hall,
Boat Works Building

(Across from the American Tin Cannery Outlet Stores)

Meeting is open to the Public

Date: Thursday, April 26, 2012 Time: 7:30 PM.

PLEASE JOIN US AT 7:00 FOR REFRESHMENTS

Speaker: Captain Jim "Homer" Holm

Subject: Monetizing Plastic Debris in the Ocean

INSIDE THIS ISSUE

CALENDAR/ NEW MEDIA RELEASES....	2
SIGHTINGS	2
GENETIC SURVEY OF ENDANGERED ANTARCTIC BLUE WHALES SHOWS SURPRISING DIVERSITY.....	3
TEAM TRACKS A FOOD SUPPLY AT THE END OF THE WORLD	3
WHAT'S IN A WHISTLE? NEW STUDY EXAMINES HOW TRANSIENT KILLER WHALES COMMUNICATE.....	5
SOME GULF DOLPHINS SEVERELY ILL AFTER GULF OIL SPILL.....	6
CARMEL MIDDLE SCHOOL RECOGNIZED BY NOAA.....	7
MEMBERSHIP.....	8

Did you know that there is an unfathomable quantity of waste, in particular plastics, in our oceans?

Non-biodegradable plastic accumulates in sea current-locked areas known as gyres. The North Pacific Gyre is a garbage patch twice the size of Texas, and it is not the only one! There has been extensive media coverage about the "garbage patch" over the past several years. In truth, a "gyre" is simply a large-scale circular feature made up of ocean currents that spiral around a central point creating a whirlpool effect that pushes water and marine plastic debris to its center. Plastics photo-degrade, they do not biodegrade, which simply means they break down into smaller and smaller pieces, but do not decompose. Hence, they remain forever in the environment and the food chain. It kills many marine animals and is found in the systems of nearly all marine and near-marine animals.

As Co-founder and Director of Operations for "The Clean Oceans Project", Captain Jim "Homer" Holm is tasked with identifying and developing the technologies that will play a key role in removing destructive plastic marine debris from the world's oceans. Captain Holm feels extremely fortunate to reside on the beautiful central coast of California where an abundance of marine education resources and an awareness of environmental issues has provided him the perfect platform to share his knowledge and passion for the health of the sea.

Please join us for a special presentation on how Captain Jim "Homer" Holm developed a solution to the plastic problem and how this technology will monetize plastic debris in the ocean.

Hope to see you there,
Donna Beckett, ACS MB Programs Committee

CALENDAR

April 14: MBNMS Sanctuary Currents Symposium: From Lions to Luminescence. Linking Land to Sea Conference to be held at CSUMB. For program schedule go to: montereybay.noaa.gov/currsymp2012

April 19: Earth Day. ACS/MB Display at Naval Post-graduate School in Monterey 10am-2pm.

April 21-22: 9am-5pm Moss Landing Marine Laboratory Open House. Itinerary will include lectures, open labs, sea lion presentations, puppet shows, & marine themed art projects. For more info: openhouse.mlml.calstate.edu

Hopkins Marine Station Spring Seminars: Fridays 12 noon-1 pm

April 20th: -Tony Farrell, Department of Zoology, University of British Columbia. Local Adaptations of Salmon Populations in an Era of Global Warming: Migrations and Mitigations

April 27th: Micheli Fiorenzi: Mediterranean Sea Ecosystem

May 21-24: 63rd Tuna Conference Lake Arrowhead, CA. Natural and Anthropogenic Effects on Highly Migratory Fish Populations. For more info go to tuna.conference.org

May 22-June 3: Marine Mammal and Seabird Behavioral Ecology of New Zealand. Class will be taught in Kaikoura, New Zealand with marine mammalogist Bernd Wursig. 13 days immersion in marine mammal and seabird ecology and behavior. For more info go to wuersig@sbcglobal.net

May 26- May 28: ACS Memorial Day Wildlife Weekend: Spend 3 days aboard the Searcher in search of Blue Whales, Dolphins, Sea Turtles, Pinnipeds, and Marine Birds. This trip will include a cruise past the Los Coronados Islands. Cost is \$450. For more info please call 619-226-2403 or ASC.org

Summer Classes at Moss Landing Marine Lab

1. Techniques and Theories of Animal Training:
Bio 348 (July 9-15) Tuition \$585
2. Working with Marine Mammals:
Bio 347 (July 23-29) Tuition \$585

Completion of both courses will earn the student a Certificate of Completion in Beginning Marine Mammalogy. Class instructor will be Dr. Jenifer Zeligs. For more info and class registration call 831-582-4500

Aug. 4: Monterey Bay Chapter ACS Summer Whale Watch "Search For The Great Blue Whale". Join us aboard the Sea Wolf 2 in search of the largest animal the world has ever known. Monterey Bay is one of the foremost locations in the world to observe blue whales. For more info please call Tony Lorenz at 831-901-7259 (more info to follow) .

Aug 11: ACS Nat'l Fundraiser- Blue Whales: Behemoths

of the Deep, Santa Barbara. Boat-Condor Express. Cost \$95 includes a Continental Breakfast. For reservations and info please call Kaye Reznick at 310-548-6279

CAMP SEA LAB: Science, Education and Adventure
2012 Sea Camps Include- School of Sharks, Flukes and Flippers, Journey to the Abyss, Girls and Science, Between the Tides and much more. For more info please call Chris at 831-582-3681

MAHALO MONDAYS IN MAY: Patronize Hula's Island Grill, 622 Lighthouse Ave, Monterey, any Monday in May after 4pm, and 10% is donated to Viva Vaquita!

Media Recommendations

Return to the Sea: The Life and Evolutionary Times of Marine Mammals By Annalisa Berta. 2012 U.C. Press

Global Perspectives on the Biology and Life History of the White Shark by Michael L. Domeier. 2012 CDC Press

The Social Conquest of Earth by Edward O. Wilson
2 time Pulitzer Prize Winner

Across Atlantic Ice: The Origin of American Clovis Culture by Dennis J. Stanford and Bruce A. Bradley

Whales and Dolphins of the European Atlantic by Dylan Walker and Graeme Creswell

Lily A Gray Whales Odyssey by Captain Dave Anderson
(Captain Dave's Dolphin Safari)

SIGHTINGS Compiled by Monterey Bay Whale Watch. For Complete listing and updates see gowhales.com/sighting.htm

<u>Date</u>	<u>#</u>	<u>Type of Animal(s)</u>
3/30 p.m.	11	Gray Whales
3/30 a.m.	15	GrayWhales
	600	Pacific White-sided Dolphins
3/29 p.m.	3	Gray Whales
3/29 a.m.	3	Gray Whales
	200	Pacific White-sided Dolphins
	200	Risso's Dolphins
3/28 p.m.	2	Gray Whales
	10	Pacific White-sided Dolphins
	100	Risso's Dolphins
3/28 a.m.	3	Gray Whales
	10	Risso's Dolphins
3/27 a.m.	18	Gray Whales
	10	Pacific White-sided Dolphins
3/26 p.m.	15	Gray Whales
	1	Elephant Seal
3/26 a.m.	16	Gray Whales
	300	Pacific White-sided Dolphins
	5	Bottlenose Dolphins
3/25 p.m.	20	Gray Whales
	5	Pacific White-sided Dolphins
	75	Risso's Dolphins

GENETIC SURVEY OF ENDANGERED ANTARCTIC BLUE WHALES SHOWS SURPRISING DIVERSITY

ScienceDaily (Mar. 7, 2012) — More than 99 percent of Antarctic blue whales were killed by commercial whalers during the 20th century, but the first circumpolar genetic study of these critically endangered whales has found a surprisingly high level of diversity among the surviving population of some 2,200 individuals.

That, says lead author Angela Sremba of Oregon State University, may bode well for their future recovery.

Results of the study have just been published in the open-access journal, PLoS ONE. As part of the study, the researchers examined 218 biopsy samples collected from living Antarctic blue whales throughout the Southern Ocean from 1990 to 2009, through a project coordinated by the International Whaling Commission.

The genetic survey revealed a "surprisingly high" level of diversity that may help the population slowly rebound from its catastrophic decimation by whalers.

"Fewer than 400 Antarctic blue whales were thought to have survived when this population was protected from commercial hunting in 1966," noted Sremba, who conducted the research as part of her master's degree with the Marine Mammal Institute at OSU's Hatfield Marine Science Center. "But the exploitation period, though intense, was brief in terms of years, so the whales' long lifespans and overlapping generations may have helped retain the diversity." "In fact," she added, "some of the Antarctic blue whales that survived the genetic bottleneck may still be alive today."

Prior to whaling, Antarctic blue whales were thought to number about 250,000 individuals -- a total that dwindled to fewer than 400 animals by 1972 when blue whales were last killed by illegal Soviet whaling. Blue whales are thought to be the largest animals ever to have lived on Earth, said OSU's Scott Baker, associate director of the Marine Mammal Institute and an author on the study -- and the Antarctic blue whales were even larger than their cousins in other oceans.

"These animals are very long-lived -- maybe 70 to 100 years -- and they can grow to a length of more than 100 feet and weigh more than 330,000 pounds," he said. "There is a jawbone in a museum in South Africa that takes up most of the lobby. This is

one reason they were so intensively exploited; they were the most valuable whales to hunt."

Despite their history of exploitation, little is known about modern-day movements of Antarctic blue whales, which are considered a separate subspecies -- differing in size and habitat use -- from the smaller "pygmy" blue whales, which live in more temperate regions of the Southern Hemisphere.

Through "microsatellite genotyping," or DNA fingerprinting, the PLoS ONE study was able to track some of the movements of individual Antarctic blue whales.

"We documented one female that traveled from one side of Antarctica to the other -- a minimum distance of more than 6,650 kilometers over a period of four years," said Sremba, who is now continuing her studies as a Ph.D. student in the Department of Fisheries and Wildlife at OSU. "It is the first documentation of individual movements by Antarctic blue whales since the end of the commercial whaling era." Baker said the long distance movement of a few individuals was "somewhat surprising" in comparison to the evidence for genetic differences between areas of the Southern Ocean. On one hand, it is apparent that individual Antarctic blue whales are capable of traveling enormous distances in search of food.

"On the other hand," Baker said, "there seems to be some fidelity to the same feeding grounds as a result of a calf's early experience with its mother. This 'maternally directed' fidelity to migratory destinations seems to be widespread among great whales."

There is much, however, which scientists still don't know about Antarctic blue whales, Baker pointed out.

"This is a poorly understood species of whales, despite its history of exploitation," Baker said. "Only now are we developing the technology to study such a small number of whales spread across such a vast habitat."

The biopsy samples were collected during more than two decades of research cruises supervised by the International Whaling Commission, and with international scientists joining research vessels from the Japanese Ministry of Fisheries.

Now that their population is slowly recovering, future studies may focus on Antarctic blue whales' migration patterns, and the locations of their breeding and calving grounds.

TEAM TRACKS A FOOD SUPPLY AT THE END OF THE WORLD

By Susan Moran (March 12, 2012)

One recent morning at the bottom of the world, Kim Bernard spotted two humpback whales gorging in the Southern Ocean not far offshore. Dr. Bernard, a biological oceanographer, was spending the austral summer at Palmer Station, the United States research outpost on an outcropping off the western Antarctic Peninsula.

Dr. Bernard and her team, known at Palmer as “The Psycho Krillers,” are studying the feeding patterns of Antarctic krill, the small, bug-eyed shrimplike crustaceans that are the central diet for whales, penguins, seals and seabirds. She is one of a growing number of scientists concerned about the effects of a kind of gold rush, as fishing companies race to the Southern Ocean to catch krill and turn it into animal feed and lucrative omega-3 dietary supplements.

The former Soviet Union began fishing krill in the ocean in the 1960s, but it was not until the 1990s that Luc Rainville, a graduate student at the University of Victoria in British Columbia, discovered that the omega-3 fatty acids in Antarctic krill were readily absorbed by the human body. In 2002 he helped found a company, Neptune Biotechnologies and Bioresources, to bring krill oil to the market as a supplement.

The annual krill harvest is still well within the limits set by the Convention on the Conservation of Antarctic Marine Living Resources, which regulates fishing in the Southern Ocean. Some scientists say the Antarctic krill fishery is the world’s most underexploited marine resource.

But fishing is not the only threat to the krill population. The creatures, especially in their larval and juvenile stages, feed on algae that live on the underside of sea ice — which is retreating as the climate warms.

And while no one argues that Antarctic krill are currently threatened or overfished, scientists and environmental groups fear that as more companies deploy more vessels — especially huge factory ships — fishing and climate change could prove a double blow to krill and the delicate Antarctic food web that depends on them.

“I’m not worried at current levels of the fish-

ing effort,” said Deborah K. Steinberg, a biological oceanographer at the Virginia Institute of Marine Science in Gloucester Point who oversees Dr. Bernard’s krill research at Palmer Station. “But I do worry about the future if the industry really starts to take off. We have to keep a close eye on it.”

The western Antarctic Peninsula is warming faster than most of the rest of the earth. Winter tem-



peratures have shot up roughly 11 degrees Fahrenheit over the past 60 years, reducing sea ice cover. Those and other effects of climate change have caused Antarctic krill populations to plummet 40 to 80 percent in the last three decades around the South Shetland Islands near the tip of the peninsula, according to research published last May in *The Proceedings of the*

National Academy of Sciences.

The research, led by Wayne Z. Trivelpiece of the National Oceanic and Atmospheric Administration, also showed that populations of Adélie and chinstrap penguins, which rely heavily on krill, declined more than 50 percent in the northern peninsula, where krill fishing vessels concentrate.

Marine scientists are working hard to make sure the Antarctic krill fishery does not collapse as many others, like Atlantic cod, have. At a meeting in November in Hobart, Australia, an international science advisory committee called for a more active approach to fisheries management.

“We’d rather not have a krill fishery,” said John Hocevar, director of Greenpeace USA’s Oceans Campaign, who represented the United States at the meeting. “But this is the world we live in. The fact that they’re in the Southern Ocean is as much an acknowledgment of the failure of fisheries management on a global scale.”

New krill-harvesting technology introduced by Aker BioMarine of Norway, the largest krill fishing company in the South Atlantic, has made it economically feasible to send vessels to the punishingly icy waters at the bottom of the world. These factory ships continuously vacuum up krill (Aker calls it “eco-harvesting”) and process it immediately on the ship. Last year Aker, which started harvesting krill in 2006, bought a second factory ship.

Many major retailers, including CVS, Costco and Walmart, sell krill oil capsules along with other omega-3 supplements. Most come from krill oil pro-

cessed by Aker BioMarine and its main rival, Neptune.

Whole Foods Market pulled krill oil from its shelves in May 2010, citing a decline in predatory sea animals — whales, penguins and seals — in areas where krill are fished.

But Aker has gained two important allies. Its krill oil was approved by the Marine Stewardship Council, a global program that issues labels certifying seafood products as sustainable, despite objections from some scientists and environmental organizations. And Aker has joined forces with WWF-Norway, an arm of the international environmental organization WWF, paying it an undisclosed amount to help Aker make its fishing practices more sustainable. Aker also provides data on krill populations to WWF-Norway and scientists studying krill and its predators.

“Krill is one of the more sustainable fisheries today,” said Matts Johansen, head of marketing at Aker BioMarine. “Compared with fish oil it’s very sustainable. And it comes from the cleanest waters on earth, with no pollutants.”

Wael Massrieh, vice president of scientific affairs at Neptune, said the company was also applying for eco-certification and was awaiting regulatory approval in the United States for a drug based on krill oil. Because “krill is at the bottom of the food chain,” he said, “it doesn’t accumulate as many heavy metals” as fish-based oils.

Vegetarian alternatives, particularly algae-based omega-3 oil made by the Netherlands company Royal DSM N.V., are also gaining ground. Altogether, sales of omega-3 supplements reached more than \$1 billion in 2009 in the United States alone, up from \$40 million in 1995. The claimed benefits include improving heart, brain and vision health.

Back at the bottom of the world, Dr. Bernard was thinking much more about krill health than human health on a recent morning as she plunged an echosounder from her rubber Zodiac boat into the Southern Ocean, its water just 31 degrees Fahrenheit.

The reading looked good. “There was a massive influx!” she wrote by e-mail. “I had never seen so much krill on the echogram before.”

She collected nearly 1,000 krill in a plankton net. A whale nearby was ready to grab the ones Dr. Bernard missed; it can eat four tons of krill each day. Dr. Bernard attributed the abundance to a healthy buildup of sea ice last winter. But the long-term trend is less certain, she said, and that does not bode well for krill or the larger creatures that depend on them.

On a good day just a year earlier, she noted, she had caught a mere 10 lonely krill.

WHAT’S IN A WHISTLE?

NEW STUDY EXAMINES HOW TRANSIENT KILLER WHALES COMMUNICATE

For transient killer whales on the hunt, making the slightest sound can mean the difference between a hard-won meal and an empty stomach. Their marine mammal prey—mostly seals and sea lions—have finely tuned hearing that quickly alerts them to danger. As a result, transient killer whales have complex rules around the audible clicks, whistles and pulsed calls they make. While echolocation clicks are primarily used for navigation and prey detection, pulsed calls and whistles are important social signals that help members of a group to recognize one another, stay together, and coordinate behaviors.

In a recent study published in the journal *Behavioral Ecology and Sociobiology*, Consortium scientists conducted the first-ever investigation into how transients use whistles compared to their fish-eating cousins, the resident killer whales.

“Here, we investigated the whistling behavior of mammal-eating killer whales and, based on divergent social structures and social behaviors between residents and transients, we expected to find differences in both whistle usage and whistle parameters,” write co-authors Dr. Volker Deecke of the Marine Mammal Research Unit at the University of British Columbia, and Dr. Rüdiger Riesch of the Department of Biology at North Carolina State University.

Riesch and Deecke had hypothesized that transient killer whales should use whistles preferentially over pulsed calls in many contexts because whistles are higher in frequency and therefore not audible to other species over the same distances as pulsed calls. However, they found no support for their hypothesis. Instead of switching from calls to whistles, transient killer whales seem to go completely mum—presumably because even the less detectable whistles can still reduce hunting success by alerting their potential prey to their presence.

The Strong, Silent Type

Riesch and Deecke painstakingly analyzed approximately 60 hours of recordings of West Coast transients ranging from Monterey Bay, California to Glacier Bay, Alaska. Using real-time spectrographic analysis, they searched the recordings for whistles, then analyzed the acoustic profile of each whistle and classified it as stereotypical (frequent and recurring) or



variable (infrequent or unique).

Their results showed that West Coast transient killer whales whistled only after making a kill or when they were engaged in social activities, as indicated by tail- and fin-slaps, breaches and spy-hops, and they were almost completely silent during all other activities. All West Coast transients seem to share a population-specific repertoire of stereotypical whistles that is clearly distinct from and less complex than that of resident killer whales.

The acoustic profiles of transient whistles showed properties more consistent with a “public” broadcast communication than a “private” one designed to avoid eavesdroppers. Transient whistles generally have lower dominant frequencies, narrower frequency ranges, a shorter duration and fewer frequency modulations—making them more similar to the public whistles of resident killer whales.

Why Whistle?

Does this mean that transient killer whale whistles serve an entirely different purpose than resident whistles? The authors speculate that while the acoustic profiles of resident and transient whistles were very different, they could share a similar function in instances such as food sharing after a kill. In these types of activities, the rate of transient whistles increased. In instances such as foraging, it appears that transients prefer not to communicate at all than risk alerting their prey.

“Hence, the main strategy of transients to minimize detection by potential prey is to limit vocal communication to certain behavioral contexts, making detection based on whistle recognition by prey impossible during foraging, regardless of a potential receiver’s hearing capabilities,” write Riesch and Deecke. “This in turn seems to have relaxed the selection on making whistles acoustically private.”

In the complex underwater world of transient killer whales, a whistle can be a dead giveaway to potential prey. Whistles are only welcome after a kill is made and there is no longer a need for stealth,

which may explain why the behavioral context of resident and transient whistles are so different.

SOME GULF DOLPHINS SEVERELY ILL AFTER GULF OIL SPILL

ScienceDaily (Mar. 26, 2012) — Bottlenose dolphins in Barataria Bay, Louisiana, are showing signs of severe ill health, according to NOAA marine mammal biologists and their local, state, federal and other research partners.

Barataria Bay, located in the northern Gulf of Mexico, received heavy and prolonged exposure to oil during the *Deepwater Horizon* oil spill.

Based on comprehensive physicals of 32 live dolphins from Barataria Bay in the summer of 2011, preliminary results show that many of the dolphins in the study are underweight, anemic, have low blood sugar and/or some symptoms of liver and lung disease. Nearly half also have abnormally low levels of the hormones that help with stress response, metabolism and immune function.

Researchers fear that some of the study dolphins are in such poor health that they will not survive. One of these dolphins, which was last observed and studied in late 2011, was found dead in January 2012.

Investigation of Dolphin Strandings in the Northern Gulf Continues

Since February 2010, more than 675 dolphins have stranded in the northern Gulf of Mexico (Franklin County, Florida, to the Louisiana/Texas border)-a much higher rate than the usual average of 74 dolphins per year, prompting NOAA to declare an Unusual Mortality Event (UME) and investigate the cause of death for as many of the dolphins as possible. The vast majority of stranded dolphins have been found dead; however, 33 have stranded alive and seven have been taken to facilities for rehabilitation.

In the spring, it is typical to see some newborn, fetal and stillborn dolphins strand, and there has been an increase in strandings of this younger age class during this UME in 2010 and 2011. Yet all age classes continue to strand at high levels. NOAA is working with a team of marine mammal health experts to investigate the factors that may be contributing to the dolphin mortalities.

Gulf Seafood Safety

Since the 2010 oil spill, the Food and Drug Administration, NOAA and the Gulf Coast states have used an agreed-upon protocol to test seafood and ensure that it is free of harmful oil and dispersant resi-

dues. NOAA opened federal waters to fishing after extensive testing, and the Gulf states continue to use the protocol to routinely test finfish and shellfish to ensure all seafood reaching the consumer is safe. Some waters in the northern Barataria Basin, a larger area that includes Barataria Bay, remain closed to commercial fishing, as visible oil is still present along the shoreline where the closures are in place. The joint protocol directs seafood safety testing to begin only after visible oil is gone.

NOAA and its state and federal partners are researching multiple ways Gulf dolphins may have been exposed to oil, including through ingestion, inhalation or externally. Dolphins could have routinely ingested oil from sediments or water while feeding or by eating whole fish, including internal organs and fluids such as liver and bile, which can harbor chemical contaminants. These are not likely routes of exposure for most people.

NOAA and its local, state and federal partners started the Barataria Bay dolphin study in 2011 as part of the Natural Resource Damage Assessment (NRDA), the process for studying the effects of the *Deepwater Horizon* oil spill.

NOAA is sharing the preliminary results from the study so that stranding responders and veterinarians can better care for live stranded dolphins and look for similar health conditions.

CARMEL MIDDLE SCHOOL RECOGNIZED BY NOAA

TWO CARMEL SCHOOLS AMONG FIVE LOCALLY HONORED BY NOAA

Carmel Middle School and Carmel River School were among five schools on the Monterey Peninsula that were honored Tuesday (Sept. 6) by Congressman Sam Farr and the National Oceanic and Atmospheric Administration (NOAA) for their work to preserve and protect local waters.

Each of the schools was saluted as being a NOAA "Ocean Guardian" School.

NOAA pointed out that "each school has shown a commitment to protecting the world ocean by participating in reduce/reuse/recycle activities to limit the amount of waste that goes into our landfills, banning latex balloons on school campus and reducing single-use plastics in school lunches."

Rep. Farr, a graduate of Carmel High School, joined Seaberry Nachbar of NOAA in presenting banners to representatives from each of the schools.

Other schools represented, in addition to the pair

from the CUSD, were Pacific Grove Middle School, Monterey Bay Charter School and Ord Terrace Elementary School.

Rep. Farr, whose granddaughter attends Carmel River School, told the gathering of Carmel River School students and others, "When we put trash into the ocean, it has all kinds of bad effects. . . . We want to celebrate the amazing Ocean Guardian program."

He said that in just the past school year over 6,000 Ocean Guardian students in this state prevented 47,000 pounds of waste from ending up in a landfill or the ocean through recycling and composting efforts.

Carmel River School Principal Jay Marden led the ceremonies, which were held in the multi-purpose room at his school. Others present included CUSD Superintendent Marvin Biasotti and CUSD Board members Amy Funt and Annette Yee Steck.

Each school received a \$6,000 grant from NOAA. It was the second such award for Carmel Middle School, which has now received \$12,000. Funding was provided by NOAA's Office of National Marine Sanctuaries.

Schools qualified for consideration by making a commitment to be an "Ocean Guardian" by proposing a school or community-based conservation project.

Schools were honored for various projects:

- Students at Carmel Middle School are working to make the campus "green" and to reduce impacts on the local watershed by eliminating single-use plastics and increasing usage of reusable water bottles.
- Carmel River School students formed a "Blue Crew" that makes monthly presentations to all students about single-use plastic, marine debris, recycling and how the students can meet the goal of zero-waste lunches at the school. (Blue Crew members were presented with Ocean Guardian T-shirts by their school Tuesday.)
- At P.G. Middle School, the Ocean Guardian Club oversees and advises a school-wide drive in which students pledge to change their own behavior to benefit the ocean.
- Monterey Bay Charter School students are working in their local watershed on a community-based restoration project.
- Ord Terrace Elementary School students have a project that focuses on the design and implementation of a dune habitat garden at the school.

American Cetacean Society
Monterey Bay Chapter
P.O. Box H E
Pacific Grove, CA 93950



RETURN SERVICE REQUESTED

Nonprofit
Organization
U.S. Postage
PAID
Monterey, CA
Permit No. 338

American Cetacean Society Membership Application Chapter#24

New Membership/Subscription ___ Gift Membership/Subscription ___
Renewal ___

Name _____

Address _____ Email _____

City, State, Zip _____

Membership level _____

Membership levels and Annual dues:

Lifetime \$1000 Patron \$500 Contributing \$250

Supporting \$85 International \$55 Family \$55 Individual \$45

Student \$35 Teacher \$35 Senior (62 plus) \$35

Subscription only * \$15/11 issues (*not entitled to membership benefits)

Check ___ Mastercard ___ Visa ___ Expiration date _____

Signature _____

Make checks payable to: ACS/Monterey Bay Chapter

Return to: Membership Secretary, ACS Monterey Bay Chapter

P.O. Box H E Pacific Grove, CA 93950

**Monterey Bay Chapter
Officers & Chairs, 2011**

Jerry Loomis, *President*
Richard Ternullo, *Vice President*
Randy Puckett, *Past Chapter President*
Diane Glim, *Vice President ACS National*
Katy Castagna, *Treasurer*
Sally Eastham, *Membership*
Jennifer Thamer, *Secretary*
Tim Thomas, *Historian*
Carol Maehr, *Conservation*
Bob Mannix, Donna Beckett *Programs*
Rene Rodriguez, *Education*
David Zaches, Art Haseltine,
Debbie Ternullo
Members at Large

Evelyn Starr, *Webmaster*
Tony Lorenz, Mary K. Paul, *Editors*
Email: kmarypaul@gmail.com
tonylorenz@bigbluebay.com