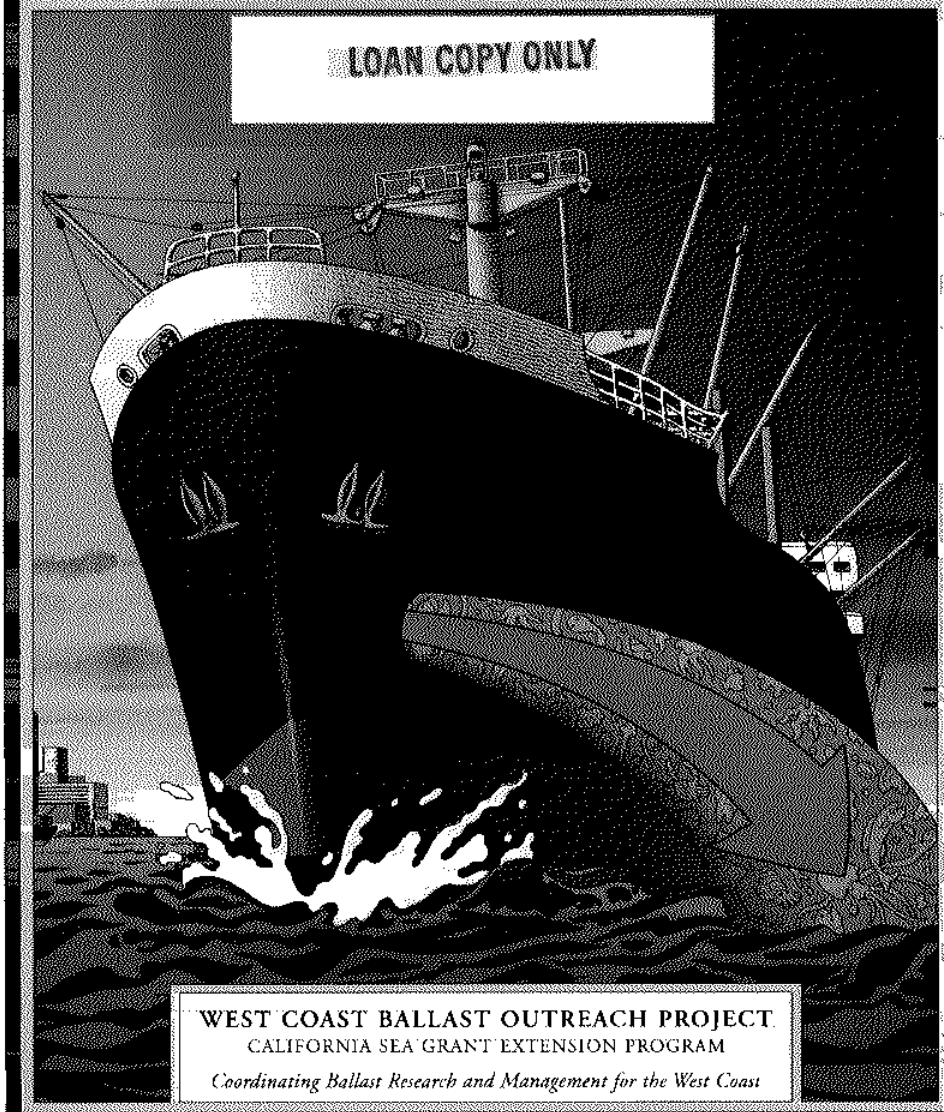
STOP BALLAST WATER INVASIONS



WEST COAST BALLAST OUTREACH PROJECT
CALIFORNIA SEA GRANT EXTENSION PROGRAM
Coordinating Ballast Research and Management for the West Coast

BALLAST MANAGEMENT TIPS

The U.S. Coast Guard has promulgated mandatory requirements and voluntary guidelines to be used by vessel operators to control the spread of aquatic species. You can help control ballast water invasions by taking preventive action. The following measures are recommended to minimize the uptake and release of harmful aquatic organisms.

PERFORM OPEN OCEAN BALLAST EXCHANGE WHEN SAFETY PERMITS

Most open ocean species cannot survive in the near shore environment. With open ocean exchange, ballast water containing organisms from near shore sites is replaced with open ocean water containing species not well adapted to the near shore environment. California law requires ships to exchange ballast water at sea or follow other specified management practices.

KEEP RECORDS OF BALLASTING OPERATIONS

Masters of all vessels carrying ballast water into U.S. waters after operating beyond the Exclusive Economic Zone (EEZ), unless specifically exempted, are required to keep records and provide written information to the Commandant, U.S. Coast Guard.

REDUCE INVASIONS VIA HULL AND ANCHOR FOULING

Non-native species can attach to hulls, piping and tanks and should be removed and disposed of properly on a regular basis. Anchors and anchor chains can be rinsed during all retrievals to prevent transport of nuisance species from their point of origin.

MINIMIZE BALLASTING IN PORTS AND COASTAL AREAS

Historically, ballast water has been one of the primary transport mechanisms for introducing aquatic nuisance species to North America's coastal waters. Although most merchant ships require ballast water for stability, minimizing the amount of ballast water taken in from ports and coastal areas will reduce the number of potential invaders transported to the next port. Preventing new invasions is key to maintaining healthy harbors and coastal areas.

AVOID BALLAST UPTAKE AT NIGHT

Some organisms that live on the bottom, or low in the water column during the day, rise in the water column at night to feed or reproduce, making them more available for uptake. The chance of bottom-dwelling organisms and sediments being entrained with the ballast water increases when ballasting in shallow ports where sediments are disturbed by propeller wash.

AVOID BALLAST UPTAKE IN "HOT SPOTS"

"Hot spots" are water bodies that are particularly infested with non-native species, that have toxic algal blooms or "red tides," that are contaminated by sewage outfalls, or that carry a waterborne disease such as cholera. Scientists and managers are working to identify global hot spots. Ballast uptake from hot spots has a greater potential of spreading harmful organisms.

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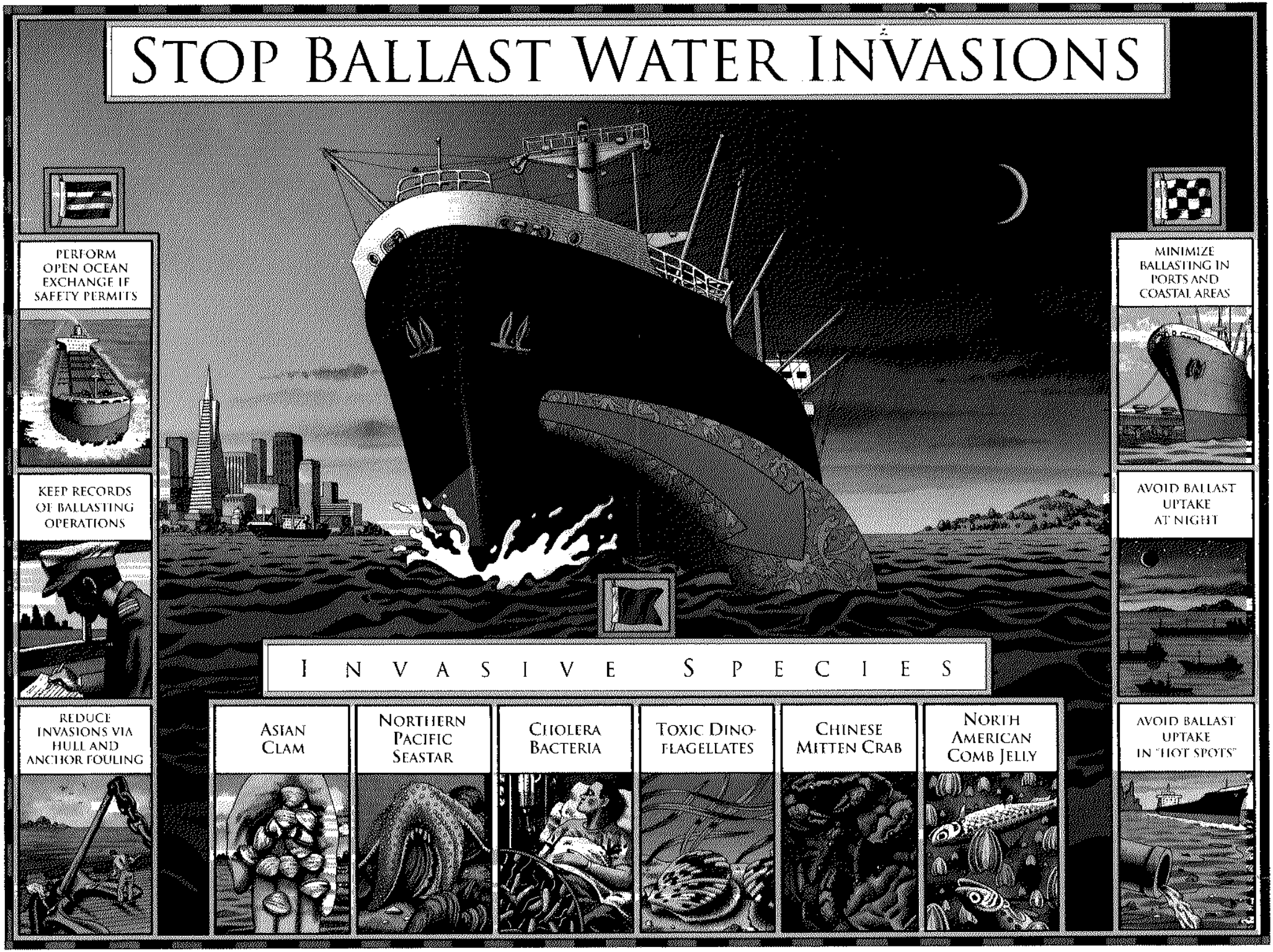

AQUATIC NUISANCE SPECIES

Aquatic nuisance species include a variety of organisms—fish, invertebrates, algae, plants and even pathogens such as cholera. Some species arrive attached to ship hulls, and others are released into foreign ports via ballast water. Most species do not survive in the new environment, but some organisms are hardy, aggressive, prolific—and successful invaders. They disperse rapidly and dominate native species.

ASIAN CLAM

(Potamocorbula amurensis)

This fast-spreading, hungry filter feeder arrived in California from Asia in the mid-1980s. Since 1988, it has maintained average densities of over 2,000 clams per square meter in the San Francisco Estuary, displacing other bivalve species. The Asian clam population has become so abundant that it can filter the entire water column in the northern reaches of the Estuary each day, severely depleting the phytoplankton population. Depletion of this link in the food web has had serious impacts on some marine organisms that rely on phytoplankton as their primary food source.

NORTHERN PACIFIC SEASTAR

(Asterias amurensis)

Larvae of this well-known native of Japanese waters were introduced to southeastern Australian and Tasmanian waters via ballast water in the 1980s. The seastar is one of the most predatory, nearshore invertebrate species and is a voracious feeder, preferring mussels, scallops and clams. The seastar has severely threatened Tasmania's shellfish industry.

CHOLERA BACTERIA

(Vibrio cholerae)

Ship's ballast brought a strain of this deadly, waterborne disease from South America to the Gulf of Mexico in the early 1990s. A cholera epidemic, starting in Indonesia in 1961, circled the globe, aided by the transport of ballast water. Human health and Alabama's shellfish industry were threatened when the bacteria reached the U.S.

TOXIC DINOFLAGELLATES

Dinoflagellates, microscopic organisms, can be transported with other plankton in both ballast water and sediments. Blooms of dinoflagellates can produce water discoloration known as "red tides." In some instances, dinoflagellates produce potent toxins that are transferred through the food web, harming or killing many marine organisms or even humans that feed directly or indirectly on them. An Australian invasion of toxic, Japanese dinoflagellates (*Gymnodinium catenatum*) caused incidents of paralytic shellfish poisoning and closure of shellfish beds in 1986 and subsequent years.

CHINESE MITTEN CRAB

(Eriocheir sinensis)

The Chinese mitten crab has caused millions of dollars in damage in European waterways. It was discovered in San Francisco Bay in 1992 and has increased in number and distribution. Migrating crabs have clogged and disrupted California's water delivery facilities and fish salvage operations. The mitten crab is a potential human health hazard as it can be a host for the Oriental lung fluke, a parasite that causes tuberculosis-like symptoms in humans. To date, the fluke has not been found in California crabs.

NORTH AMERICAN COMB JELLY

(Mnemiopsis leidyi)

A voracious, plankton-eating, comb jelly common to the Atlantic Coast of North America was introduced into the Black Sea and Sea of Azov in the early 1980s. It underwent a gigantic bloom in the late 1980s causing severe economic and social impacts. The cost to Black Sea fisheries is estimated at $250 million, and anchovy fisheries in the Sea of Azov are nearly extinct.

REGULATING BALLAST WATER

The Marine Environmental Protection Committee of the United Nations International Maritime Organization has developed voluntary guidelines for ballast water management.

The principal U.S. legislation controlling the discharge of ballast water is the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA) and the National Invasive Species Act of 1996 (NISA). Under NISA, all vessels carrying ballast water into U.S. waters are required to keep records and provide written information to the U.S. Coast Guard. Ships are encouraged to follow voluntary precautionary measures.

The Ballast Water Management for Control of Nonindigenous Species Act (AB 703) went into effect on January 1, 2000 establishing a general ballast water management program for California under the direction of the State Lands Commission. The law requires all vessels, with certain exceptions, that enter U.S. territorial waters, to manage ballast water according to prescribed measures in order to prevent the release of nonindigenous species into state waters. Failure to comply can result in civil penalties.

BALLAST WATER MANAGEMENT	Regulatory Programs		
	International Maritime Organization	U.S. National Program (National Invasive Species Act)	California (AB 703)
Provisions			
Requires mandatory open ocean exchange			•
Contains safety and other exemptions	•	•	•
Applies to domestic intrabasin/coastal voyages			
Allows alternative treatment methods, if approved	•	•	•
Requires ballast management plan		•	•
Includes fees to support program			•
Offers incentives for alternative treatment			•
Reporting			
Required for voyages from outside the EEZ		•	•
Electronic submission of form	—	•	•
Verification and Enforcement			
Requires sampling to verify management activity		•	•
Includes penalty for non-reporting	—		•
Includes penalties for non-compliance with management requirements		(potential after 2 years)	•

For More Information Contact:

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http://ballast-outreach-ucsgep.ucdavis.edu

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Sea Grant Nonindigenous Species Site
http://www.sgnis.org

Northeast-Midwest Institute
http://www.nemw.org/biopollute.htm

Smithsonian Environmental Research Center
National Ballast Water Clearing House
http://invasions.si.edu

Sea Grant Marine Invasive Species Team (MIST) Program
http://seagrant.orst.edu/mist/index.html

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Reporting Forms, Instructions, Regulations and Additional Educational Materials are available from:

U.S. Coast Guard Ballast Water Management Program
http://www.uscg.mil/hq/g-m/mso/mso4/

Commandant, Environmental Standards Division (G-MSO-4)
2100 Second Street, SW
Washington, DC 20593
(202) 267-0500

California State Lands Commission
http://www.slc.ca.gov

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Printed on recycled paper using soy-based inks
November 2000

This publication is funded in part by a grant from the National Sea Grant College Program, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, under grant number NA66RG0477, project number A/EA-2 through the California Sea Grant College System, and in part by the CALFED Bay-Delta Program. Additional funding was provided by the U.S. Coast Guard, Port of Long Beach and California State Lands Commission. The views expressed herein do not necessarily reflect the views of NOAA or any of its sub-agencies. The U.S. Government is authorized to reproduce and distribute for governmental purposes.