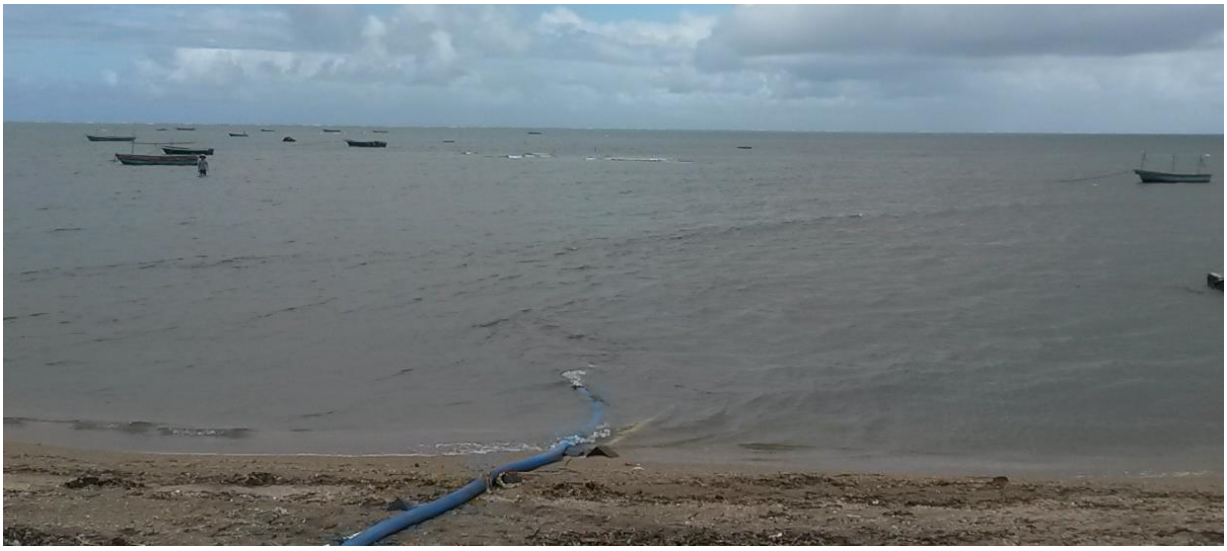
FACT ! SHEET

ZMT LEIBNIZ CENTRE for Tropical Marine Research

ORGANIC POLLUTANTS in Hainan, China

Organic pollutants originate from human activities and have proven harmful effects in the environment. Once released from aquaculture, municipal sewage or other sources, many remain intact in the environment for years and become widely distributed. Some organic pollutants are highly toxic or can accumulate in tissues of living organisms, causing health problems for animals and humans.



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FACTS

What are organic pollutants?

Organic pollutants are pesticides, industrial chemicals, or unwanted byproducts of agriculture or other processes sharing the following characteristics:

Persistence: resistant against degradation

Bio-accumulation: accumulate in living tissues

Long-range transport: they can travel long distances from the source of release through air, water and animals.

Industrial emissions as a source of pollutants

The most harmful substances in coastal waters of Hainan originate from aquaculture effluents, shipping traffic and municipal sewage. Some of these compounds are relatively resistant against degradation and remain intact in the environment for many years.

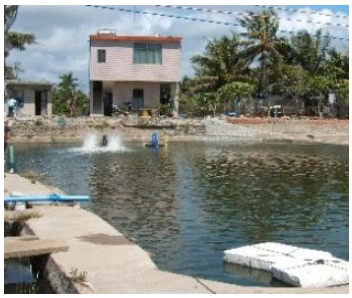
Origin of pollutants in Hainan coastal waters

Aquaculture effluents

Our study has found that aquaculture effluents are a source of triazine herbicides which are persistent and accumulate in the food chain.

As yet, no acute toxic effects on local coral reefs and seagrass beds are observed. However, it is likely that herbicide contamination has deteriorating effects in the long-term.

Drugs and biocides used in aquaculture



Ship paintings

Shipping traffic/Ship paintings

Shipping traffic

Despite China's ban on the usage of organotin compounds in antifouling products for ships since 2011, high concentrations were found in sediments from harbor areas in Hainan. This contamination has potential to impair the health of aquatic organisms.

Municipal sewage

Pharmaceutical drugs, personal care product ingredients, detergent residues, antimicrobials, and household pesticides were the most frequently detected compounds in municipal sewage.

Household pesticides

Personal care products

Photos on this page: L. Dsikowitzky, L. Hagemann, P. Li, T. Jennerjahn

Some organic pollutants accumulate in the fatty tissue of living organisms including humans and are found at higher concentrations at higher levels in the food chain. Such compounds could also occur in the fishery resources of Hainan coastal waters.

Interesting links

Stockholm Convention: http://chm.pops.int

References

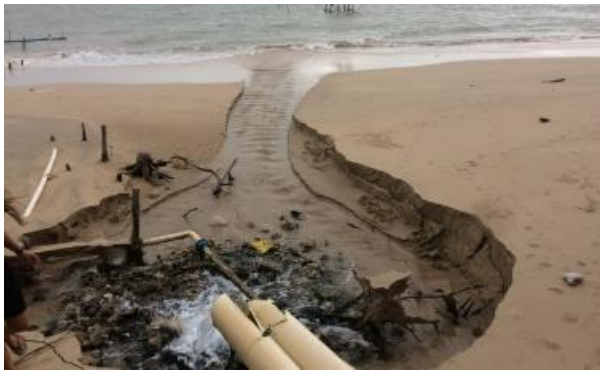
Dsikowitzky et al. 2020 Occurrence and origin of triazine herbicides in a tropical coastal area in China: A potential ecosystem threat. Estuar. Coast. Shelf Sci., 235:106612

Some chemicals can be used to trace the emissions from a specific pollutant source in the environment. Our study has found that the herbicide prometryn is a source-specific molecular indicator to trace aquaculture emissions in the environment.

What can we do?

- Pesticides are poisons. Avoid using them whenever we can.
- Use environmentally friendly cleaning products for cleaning and washing.
- Recycle remains of paint, garden pesticides, and all other chemicals.
- Support companies that make clean products. Ask before buying.
- Stay informed and act responsibly.

Organic Pollutants in the environment pollute the everyday food supply



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Take home messages

- → **Organic pollutants become widely distributed in the environment and accumulate in the food chain**
- → **They pose a serious threat to human healthy and the environment**
- → **The herbicide prometryn is a source-specific molecular indicator to trace aquaculture emissions in the environment.**
- → **No use of organotin compounds is strongly recommended in Hainan to remediate the pollution and impacts of these compounds**

Imprint

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