



# IMarEST Emerging Marine Trends

## Issue 5 - Permafrost

### *Revealing a hidden toxicity in long-frozen environments*

Arctic permafrost – soil and rock that has been frozen for more than two years – contains mercury. The Northern Hemisphere permafrost contains around 1,656,000 tonnes of mercury, which is double the total amount in soils, oceans and the atmosphere around the world. The high northern latitudes have greater levels of mercury than anywhere else as a result of complex atmospheric and ocean processes.

Arctic permafrost accounts for 24% of all land in the Northern Hemisphere and is now thawing thanks to climate change and threatens to realise this huge mercury store. A significant portion of this will find its way into the oceans.

Mercury can be converted into methylmercury by bacteria, which is a highly toxic substance. This can then be consumed by other marine life, which would then cause neurological problems and affect the ability of animals to reproduce. This could have devastating ecological and economic problems, as marine food webs and fish stocks will be drastically altered.

Mercury is known to build up in areas thousands of miles away from the original pollution source and in animals (bioaccumulation) such as fish, seals, whales, polar bears and walrus. As it accumulates in marine life lower in the food chain, which is then in turn eaten by those higher in the food chain, it can be found in high levels in top predators (biomagnification). It could even eventually make its way into the seafood we eat.

A [recent study](#) found record amounts of mercury have been released into waterways, illustrating this is a poorly understood issue that is already a problem and will only be exacerbated in the future.



## How can you help?

As the topic of melting permafrost and mercury is a new issue, you may think it might be hard to engage with. However, you can still get involved in this issue by helping to combat climate change. By doing your bit to reduce your contributions towards climate change, we can attempt to mitigate some of the global warming effects on melting permafrost. If you would like to get involved and help with the issues raised in this article, here is a list of useful tips and resources:

- **Make your work commute greener** – a 2017 study by Lund University, Sweden, ranked 148 actions that an individual can take to reduce climate change. It found that going car-free was the most effective action that you can take to reduce emissions. Instead of driving, try taking public transport or riding a bike. If you have to drive, try car-sharing or switching to an electric or hybrid vehicle. When going on holiday [fly less](#) if you can but if you do have to fly, try to [offset your emissions](#). [Find out more](#) on how to make your transportation more sustainable.
- **Reduce your meat intake** – after fossil fuels, the food industry is one of the biggest contributors to worldwide greenhouse gas emissions – if all the cattle were their own nation, they would be the world's third largest emitter of greenhouse gases! You don't need to go vegetarian or vegan to have an impact, by simply [reducing your animal protein consumption by half](#), you can [reduce your carbon footprint by more than 40%!](#)
- **Eat organic** – apart from the health benefits of not putting pesticides in our bodies, eating organic also benefits the environment as many synthetic fertilisers begin as by-products of oil refining. This means every time we eat a conventional fruit or vegetable, we're giving a little boost to the oil industry. [Find out more](#) on why eating organic benefits the climate.
- **Use energy wisely** – by [using your energy in a more efficient way](#), you can both reduce your carbon footprint and save money. Try these small changes:
  - Change to energy-efficient lightbulbs
  - Turn computers and TV's off standby
  - Look for a high energy efficiency rating sticker when buying new appliances
  - Insulate your home for the winter to stop heat escaping
  - Wash your clothes in warm (not hot) or cold water
  - Hang up your clothes to dry them rather than use a tumble dryer
- **Exercise your rights as both a citizen and as a consumer** – if we all try and influence how industries are run or subsidised, we can all make larger scale changes. By putting pressure on governments and on companies, system-wide changes can be made that will make a huge difference. On a more individual level, we can 'divest' funds out of polluting activities. By avoiding investing in fossil fuels or banks that invest in industries that are high in emissions, we can take climate action while also gaining economic benefits.
- **Spread the word!** – by staying up to date on issues that are related to the Antarctic benthos, climate change and global warming and helping to make others aware of the problem and what they can do to help, you can help drive wider behavioural changes. Follow the news in dedicated ocean news platforms such as [the IMarEST's newsroom](#) or [Climate Home News](#) and tell your friends, family and work colleagues about what they can do to help combat climate change.

