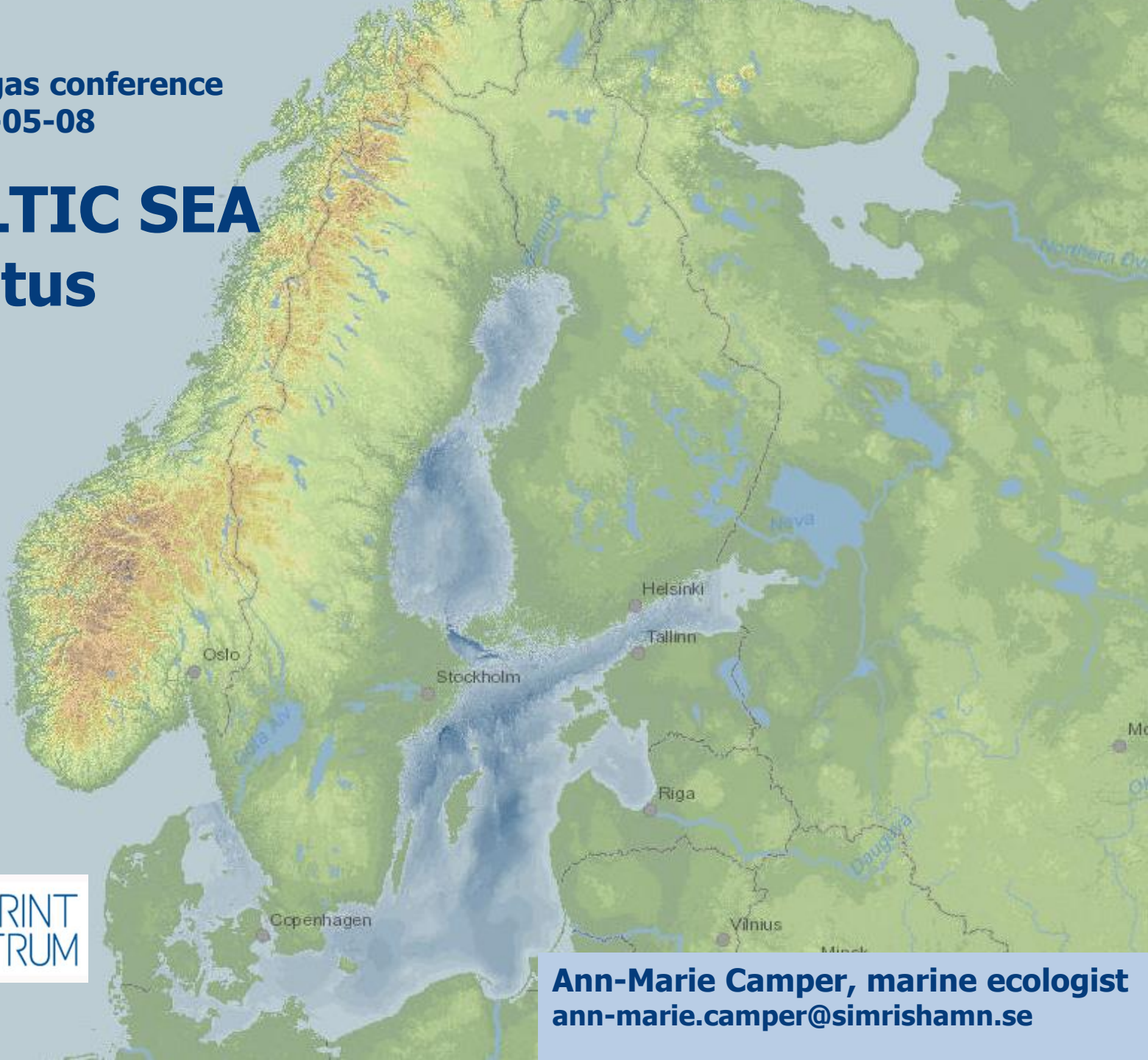


**COASTAL Biogas conference
2019-05-08**

THE BALTIC SEA status



**Ann-Marie Camper, marine ecologist
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LET'S START BIG!

**ONE PLANET
ONE OCEAN**



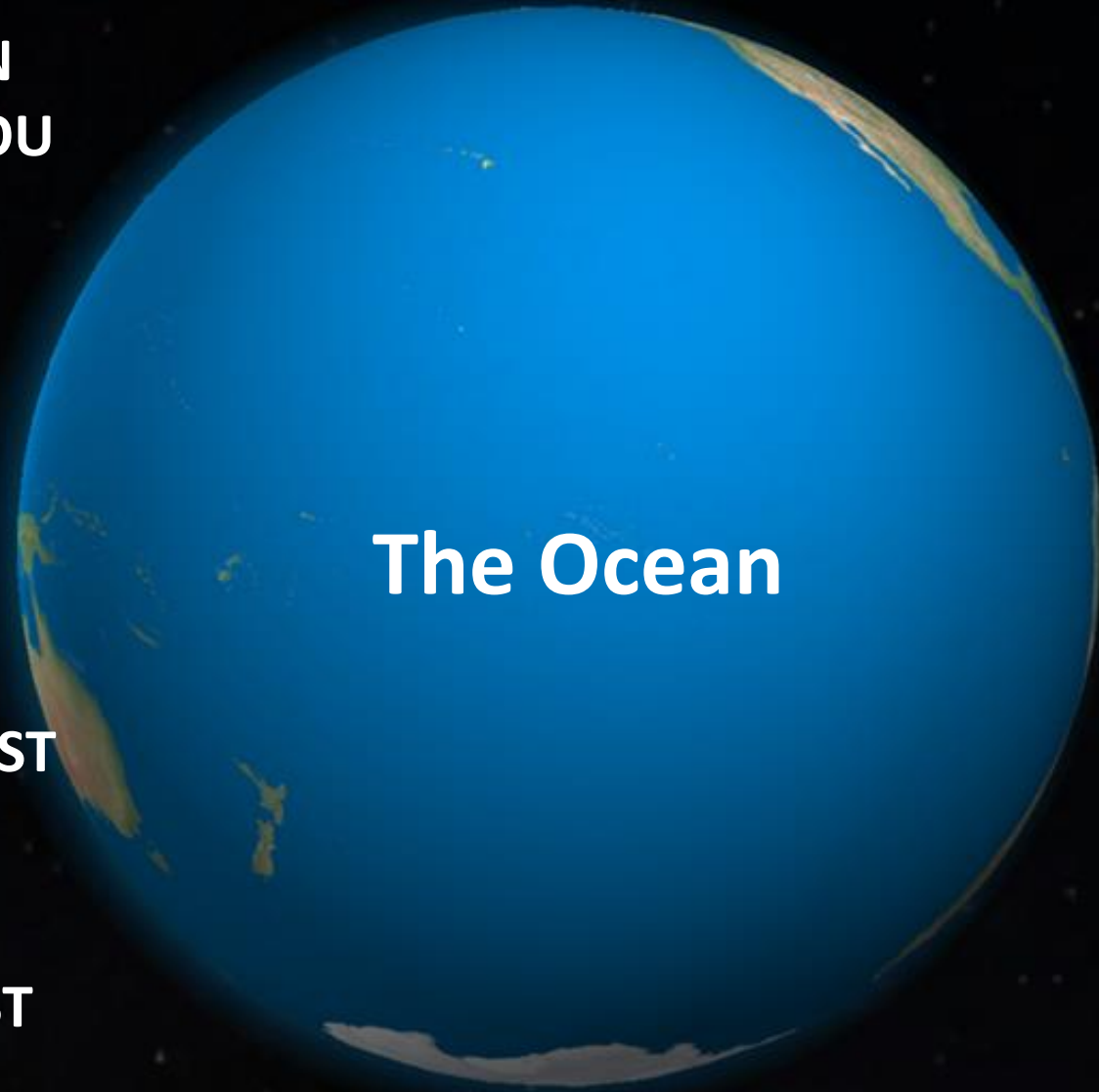
**GIVES YOU THE OXYGEN IN
EVERY SECOND BREATH YOU
TAKE**

CO₂-SINK

ACCUMULATES HEAT

**FISH IS MANKIND'S LARGEST
SOURCE OF PROTEIN**

**THE WORLD'S 7TH LARGEST
ECONOMY**



The Ocean

THE BALTIC SEA

Natural impact



Natural "impact" on species



Brackish water

It's all about salinity

➤ **Effect: stress on species**




High residence time of the water

25–30 years

➤ **Effect: The added substances are kept in the water for a long time!**



Brackish stress. Why?

- Most organisms in the Baltic originates from salt or fresh water
 - They live on the threshold of their geographic range
-
- 
- **Few species , but many individuals**
 - **Often smaller sizes**

Impact from human activities



The Baltic Sea Drainage Basin

90 million
people lives
in the
drainage
area



GRID

Assessment

600 km
↑
N

The Baltic Sea Drainage Basin

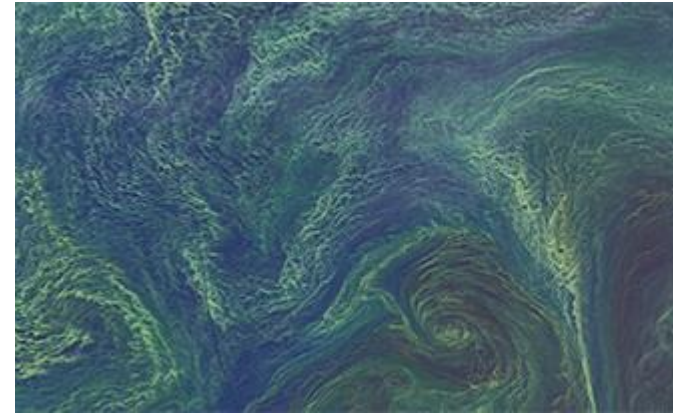


Human impact

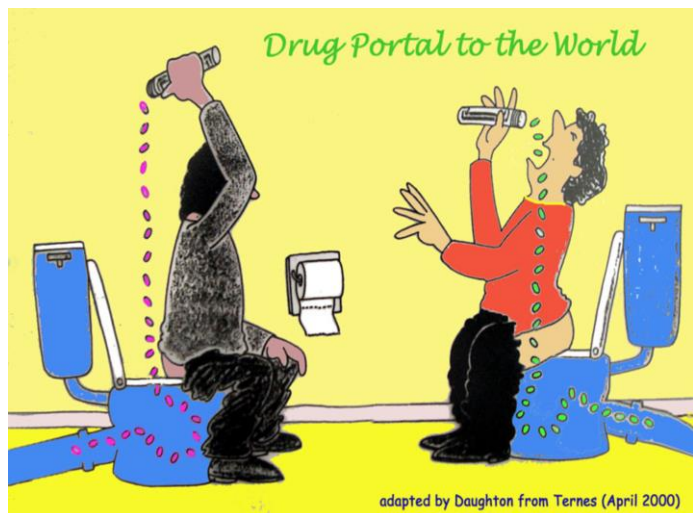
- Eutrophication
- Hazardous substances
- Alien species
- Radioactivity
- Shipping
- Fishery
- Marine litter
- Underwater sound
- Climate change

Eutrophication

- Surplus of nutrients, mainly phosphorus (P) and nitrogen (N).
- Causes a disturbance in the food web.
- One visible effect is plankton algae bloom
- Degradation of plankton causes oxygen deficit on the sea bed



Hazardous substances



- PCBs
- DDT
- HCH
- Dioxin's
- PAHs
- Pharmaceuticals
- Heavy metals
 - mercury, cadmium, lead, copper and zinc.



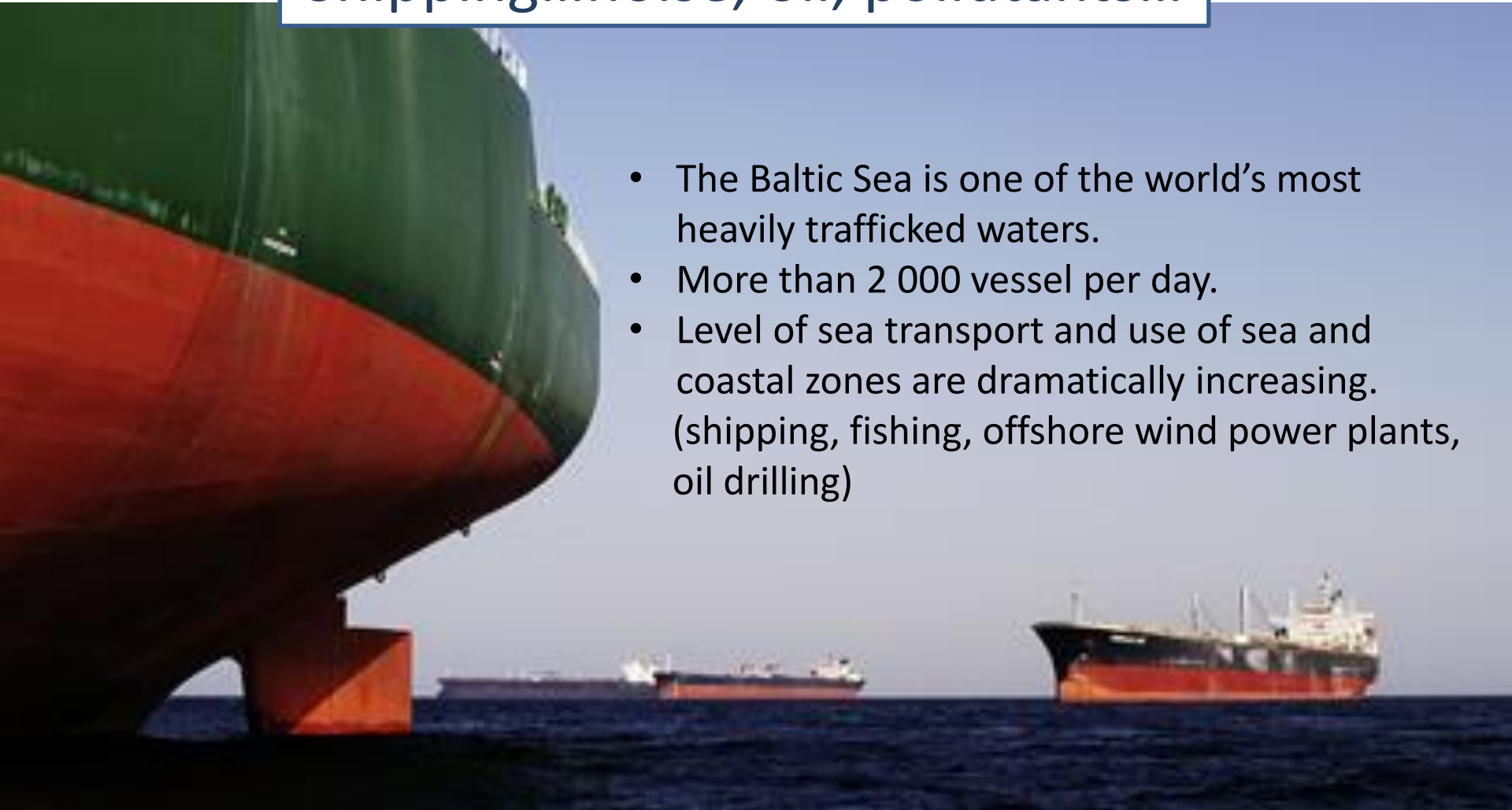
Cocktail effect



negative synergy

Shipping...noise, oil, pollutants...

- The Baltic Sea is one of the world's most heavily trafficked waters.
- More than 2 000 vessel per day.
- Level of sea transport and use of sea and coastal zones are dramatically increasing. (shipping, fishing, offshore wind power plants, oil drilling)



Climate change - effects



Sea level rise

Higher temperature

Lower salinity

Brown water in coastal areas

Acidification -lower pH

Enhanced eutrophication

Lower oxygen levels

The coastal area – the most
valuable and vulnerable part of the
ocean







STATUS

Eutrophication

- 97% of the Baltic Sea area is affected by eutrophication.
- Inputs of nutrients from land have decreased, but the effect of these measures are not yet generally reflected in the status of the marine environment.
- **Some improving trend**



STATUS

Hazardous substances

- Levels of contaminants are elevated and continue to give cause for concern.
- Mainly polybrominated flame retardants and mercury, together with Cesium (Cs-137), deposited after the accident at the Chernobyl nuclear power plant in 1986.
- Acute pollution events from oils spills have decreased.
- **Some improving trend**



STATUS

Marine litter

- Plastic litter is a special concern due to its risk to the environment and its slow rate of degradation.
- Around 70 % of the litter items in the Baltic Sea are derived from plastic materials.
- **Negative trend**



STATUS

Underwater sound

- Underwater sound is a widely distributed pressure in the Baltic Sea, caused by various human activities.
- Areas with high levels of continuous sound mainly coincide with areas of high vessel traffic.
- **Negative trend**



STATUS

Non-indigenous species

- Around 140 non-indigenous species have so far been recorded.
- Of these, 12 are new during 2011–2016.
- In addition, an unknown number of previously arrived non-indigenous species have expanded their distribution range to new sub-basins.
- **Negative trend**



STATUS

Species removal by fishing and hunting

- 3 out of 9 assessed commercial fish stocks are in good status with respect to both biomass and fishing mortality rates.
- 8 stocks are currently lacking an evaluation with respect to both of these aspects.
- Hunting of marine mammals and birds is minor.
- **Negative trend**



STATUS

Seabed loss and disturbance

- Less than one percent of the seabed is estimated as potentially lost due to human activities.
- Roughly 40 % of the seabed is estimated as potentially disturbed
- **Negative trend**



STATUS

Biodiversity

- Results suggest that the environmental impact on species are far-reaching and not restricted to certain geographic areas or certain parts of the food web.
- **Alarm!**



STATUS

Food web aspects

- In some geographic areas and species indicate
- a decreased nutritional status and size structure in fish (such as Eastern Baltic cod),
 - a decreased nutritional status in mammals (such as grey seal)
 - a decreased size structure in zooplankton, all pointing towards a deteriorating food web status.
 - **Alarm!**



STATUS

Cumulative impacts and spatial aspects

- The highest potential environmental impacts currently occur in the southwestern Baltic Sea.
- The pressures resulting in most impact on species are concentrations of nutrients and contaminants, non-indigenous species, and the extraction of fish.
- **Alarm!**



STATUS

Impacts on human well-being

- Human activities contribute to pressures that act on the Baltic Sea environment but are also in many cases dependent on a healthy state of the marine environment.
- The cost of degradation with respect to eutrophication in the Baltic Sea region is estimated to result in total losses of around 3.8–4.4 billion euros annually.



<https://youtu.be/rtxpinz-YrU>

Let's act for a healthy ecosystem in the Baltic Sea!



A photograph of a sailboat on the ocean at sunset. The sky is filled with vibrant orange and yellow hues, transitioning to a darker blue at the top. The sailboat's mast and rigging are visible in the foreground, and the dark blue sea stretches to the horizon.

Thank you for listening!

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