STUNG! ON JELLYFISH BLOOMS AND THE FUTURE OF THE OCEANS

Enormous “dead zones” at the mouths of the world’s great rivers. Every major commercial ocean fish and seafood stock predicted to crash within 40 years, from overfishing. Vast stretches of ocean bottom turned to desert by trawlers. Coral reefs and shellfish worldwide disappearing thanks to ocean acidity. A plastic dump in the Pacific twice the size of Texas – one of several. Huge jellyfish blooms jamming nets, clogging intake pipes, closing beaches, taking over entire seas.

Such are some of the grim topics explored by Lisa-ann Gershwin in *Stung! On Jellyfish Blooms and the Future of the Oceans* (2013).

Before the appearance of fish and whales, beginning 300 million years ago, jellyfish had ruled as the oceans’ top predators for 100 million years. Now humans, by changing the oceans’ chemistry and killing off the fish and the whales, are inviting them back. Massive jellyfish blooms, Gershwin says, “are the inevitable outcome of extreme changes in the marine environment.”

In the Black Sea, weakened by human pollution and gross overfishing, a jellyfish called Mnemiopsis came to comprise 95% of that sea’s biomass. The size of a chicken egg, with no brain, backbone or eyes, Mnemiopsis crippled three national

economies and wiped out an ecosystem. It has also mostly wrecked the Caspian Sea, and has now spread to the Mediterranean.

Similar threats have appeared off the coast of Maine, California, Japan, Australia and Tasmania.

But, you say, the oceans are so vast, it's absurd to think of anything "taking them over."

In fact, about 90% of the oceans' surface is a biological desert. For most species, the usable part of the oceans is not too far down or too far from shore. Areas of cold water upwelling make up no more than 1/10th of 1% of the oceans' surface, but produce half the world's fish supply. Almost a third of all marine fish species are associated with coral reefs, and they're disappearing thanks to trawling and CO2 caused acidification.

Yet the oceans are our support system, driving climate, fresh water availability, temperature, generating most of our oxygen and taking up much of the excess CO2 responsible for global warming -- to say nothing of feeding millions and providing cultural playgrounds. If they're in trouble, we are.

And they are in trouble, thanks to us. We've degraded the oceans with oil spills, overfishing, bycatch, habitat destruction, ghost nets, dead zones (approaching 700 now) plastic waste, radioactive waste – the list goes on.

No doubt greed has driven much of this, but ignorance plays a big role too.

Of the oceans' food chains, fish, bears, whales, seals, penguins, etc. comprise a tiny percentage. 99% -- from microscopic phytoplankton, the essential basis of the food chain – to an array of invertebrates (worms, snails, urchins, etc.) that feed on them, are invisible to us because we don't eat them. It's as if in raising beef we destroyed all the pasture, failing to see the connection between meat and grass.

Enter jellyfish. Most are smaller than a dime and transparent. Because they're soft-bodied and short lived, pollution doesn't much bother them. They can reproduce sexually or asexually, and explode into huge blooms overnight. Dark water? No matter: they're tactile feeders. Warm water? They thrive in it.

They eat voraciously down the food chain, including immature fish and turtles, but provide almost nothing up it. Is food scarce? They consume their own bodies, then feed again when food's available. Once established, they tend to remain dominant.

Weeds, Gershwin calls them. We're creating perfect conditions for them to thrive, to rule the oceans again.

Her advice? Adapt.

Jellyfish burgers, anyone?