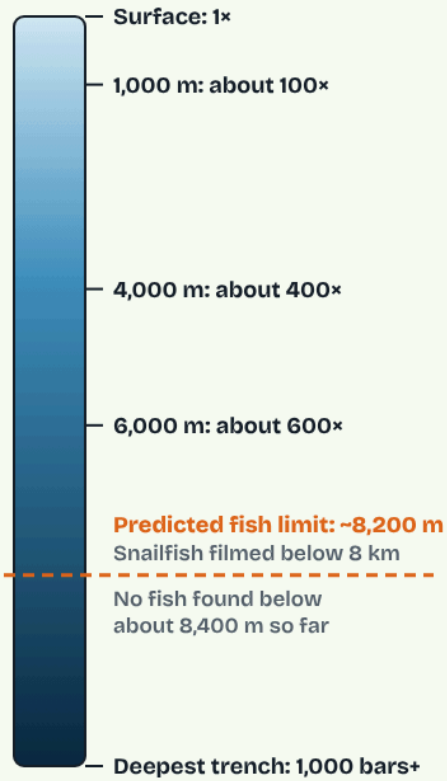
That is why

How can life exist under that much pressure?

Pressure picks on gas pockets, diving lungs and the proteins inside every cell. Life has a fix for each.

A Pressure climbs



+1 atmosphere every 10 m (33 ft)

B Weak spots 1 and 2: gas

1 Air pockets get squeezed

Foam cups lowered to about 1,000 m come back shrunk. A fish hauled up fast swells as gas in its swim bladder expands (barotrauma).



2 The fix: little or no gas

Many deep-sea fish have small or no swim bladders. A jellyfish is about 95% water. One rattail still had a gas-filled swim bladder at 7,259 m.

3 Divers: let the lungs fold

A whale's flexible chest lets its lungs collapse on the way down. That limits gas exchange, so less nitrogen gets into the blood.

C Weak spot 3: inside the cell

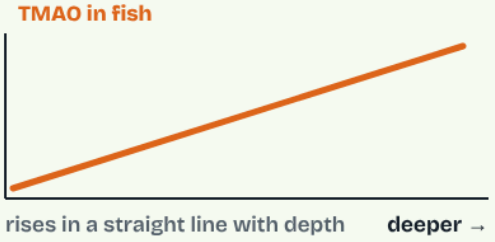
Pressure upsets how proteins fold and makes cell membranes too stiff.

1 Supple membranes

More unsaturated fats keep cell membranes fluid enough to work.

2 TMAO: protein armor

A helper molecule that counteracts pressure's effects on proteins.



No air to crush, lungs that fold, cells with armor.

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