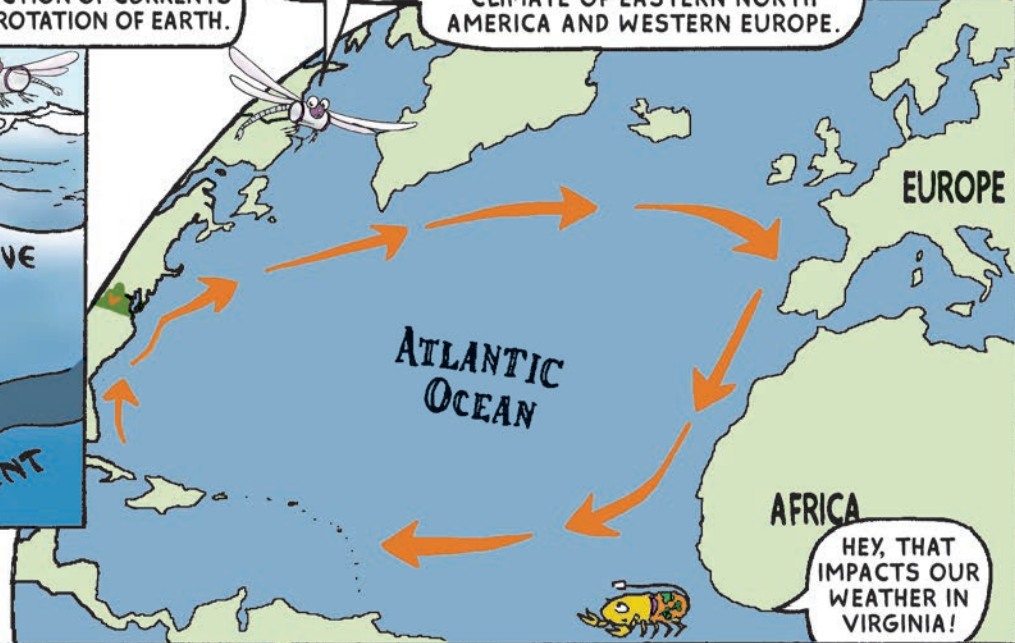
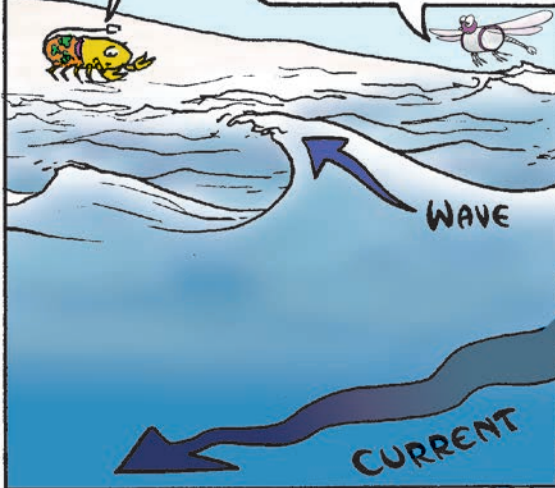


THE OCEAN IS NEVER STILL, DRAGONFLY. WHY?

THE BASIC MOTIONS OF OCEAN WATER ARE THE **WAVES, TIDES AND CURRENTS**. OCEANS ARE ALWAYS MOVING BECAUSE AN OCEAN SURFACE HAS LARGE CURRENTS KEPT IN MOTION BY WINDS. THE DIRECTION OF CURRENTS IS ALTERED BY THE ROTATION OF EARTH.

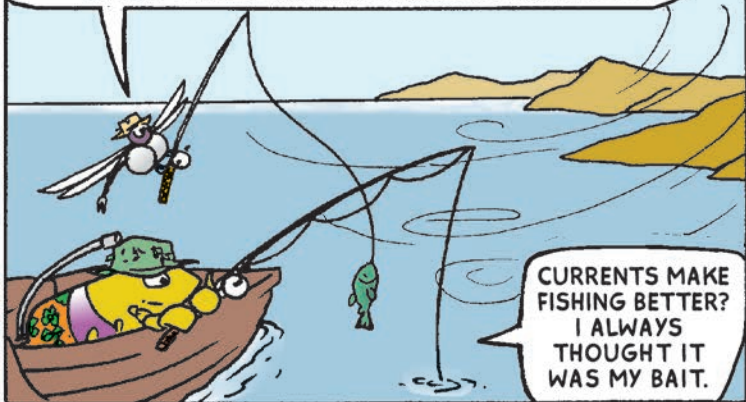
THE BEST-KNOWN CURRENT IS THE **GULF STREAM**, LOCATED IN THE NORTH ATLANTIC OCEAN. THE GULF STREAM STARTS IN THE GULF OF MEXICO AND FOLLOWS THE EAST COAST OF THE UNITED STATES BEFORE CROSSING THE ATLANTIC TO THE WEST COAST OF EUROPE. THE GULF STREAM INFLUENCES THE CLIMATE OF EASTERN NORTH AMERICA AND WESTERN EUROPE.



HEY, THAT IMPACTS OUR WEATHER IN VIRGINIA!

IN REGIONS WHERE WINDS BLOW OFFSHORE, SUCH AS HERE ON THE WEST COAST OF MEXICO, SURFACE WATERS MOVE **AWAY** FROM THE LAND AND ARE REPLACED BY COLDER WATER. THIS WATER FROM THE DEEP IS RICH IN NUTRIENTS - WHICH MAKES FOR EXCELLENT FISHING SPOTS!

CURRENTS AFFECT MANY THINGS ABOVE AND BELOW THE SURFACE OF THE OCEAN, FROM MIXING PLANT AND ANIMAL POPULATIONS TO CREATING NAVIGATIONAL ROUTES FOR LARGE SHIPS. SHIPS TRANSPORT PRODUCTS AROUND THE WORLD, AND CURRENTS GUIDE THEM INTO PORT SAFELY AND ON TIME!



CURRENTS MAKE FISHING BETTER? I ALWAYS THOUGHT IT WAS MY BAIT.



CURRENTS HELP SHIPS STAY CURRENT! HA!

I'M THIRSTY.
LET'S SEE HOW
-EYUCH! OCEAN
WATER IS SALTY!!

YES IT IS, SCORPY,
AND HERE'S WHY...

MOUNTAIN STREAM?
DON'T YOU HAVE THE
WRONG PICTURE?!

FOR MILLIONS OF YEARS, RAIN, RIVERS, AND STREAMS WASHED OVER ROCKS CONTAINING A CHEMICAL CALLED SODIUM CHLORIDE AND CARRIED IT DOWN TO THE OCEANS. WHEN THE SUN EVAPORATES WATER FROM THE SURFACE OF THE OCEANS, THE SODIUM CHLORIDE IS LEFT BEHIND. YOU PROBABLY KNOW SODIUM CHLORIDE BY ITS OTHER NAME: TABLE SALT!

NO WAY!!

DIFFERENT BODIES OF WATER HAVE DIFFERENT AMOUNTS OF SALT MIXED IN - A MEASUREMENT WE CALL SALINITY. SALINITY LEVELS ARE DIFFERENT BECAUSE EVAPORATION RATES AND WATER RUNOFF FROM NEARBY LAND ARE DIFFERENT. FOR EXAMPLE, THERE IS HARDLY ANY SALT IN CONTINENTAL WATERS, BUT THE RED SEA IS VERY SALTY.

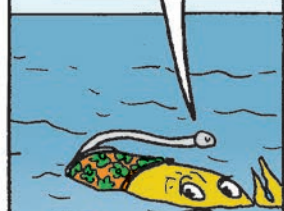
OCEAN TEMPERATURE ALSO VARIES. WARM TROPIC REGIONS HAVE WATER AT 100 DEGREES, BUT WATER AT THE POLES IS ALMOST FREEZING. THE FREEZING POINT OF OCEAN WATER IS ABOUT 29 DEGREES FAHRENHEIT INSTEAD OF THE 32 DEGREES F FOR ORDINARY WATER.

LET ME GUESS: IT'S
BECAUSE OF ALL THE
SALT IN THE WATER?

SO ARE LOW SODIUM
SEAS HEALTHIER FOR YOU?!

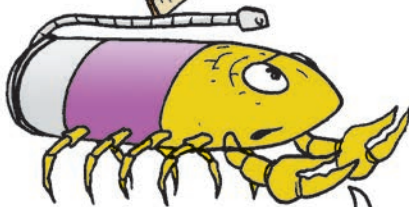
RIGHT ON, SCORPY! YOU'RE LEARNING
FAST, BUT WE'VE ONLY BEGUN TO
SCRATCH THE SURFACE OF OCEANS!

HEY, DRAGONFLY,
THE WATER IS
GETTING **DEEPER**
AS I WADE INTO IT.



YES, SCORPY -
THE OCEANS AND
SEAS VARY GREATLY
IN THEIR DEPTH.

AS YOU CAN SEE,
THE PACIFIC OCEAN
IS THE DEEPEST,
AND THE ARCTIC
OCEAN IS THE
SHALLOWEST.



YEAH, BUT IT'S STILL
WAY OVER **MY** HEAD!

Arctic Ocean 3,953 FT

Atlantic Ocean 12,881 FEET

Indian Ocean 13,002 FEET

Southern Ocean 13,100 FEET

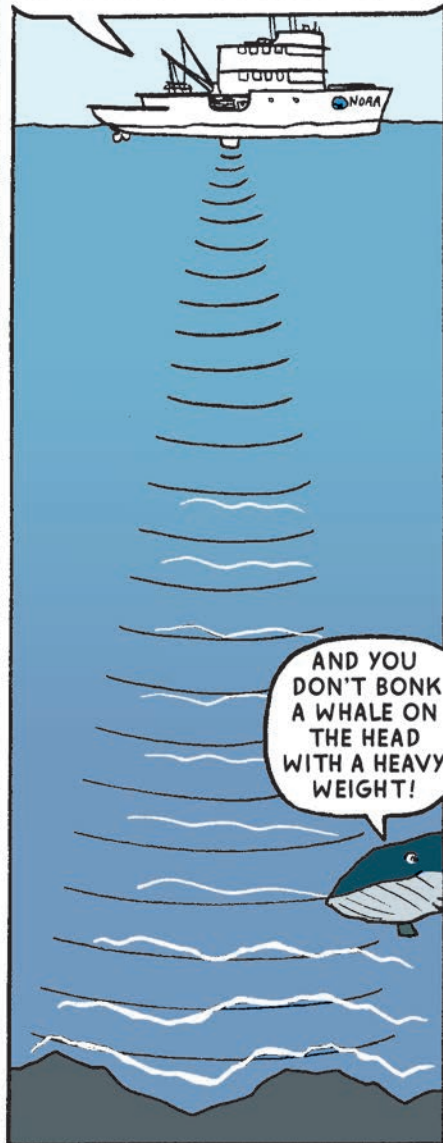
Pacific Ocean 15,215 FEET

THESE OLD GUYS MUST BE
TRYING TO CATCH A GIANT
FISH WITH THAT BIG LINE!!



NO, THIS IS HOW ANCIENT
SAILORS MEASURED THE DEPTH
OF THE SEAS. THIS LEAD
LINE WAS A LONG ROPE MARKED
OFF IN 6 FOOT INTERVALS
CALLED FATHOMS. A LEAD
WEIGHT WAS TIED TO ONE
END. SAILORS DROPPED THE
WEIGHT INTO THE WATER AND
MEASURED HOW MUCH THE
LINE WENT OUT UNTIL THE
WEIGHT HIT THE BOTTOM.

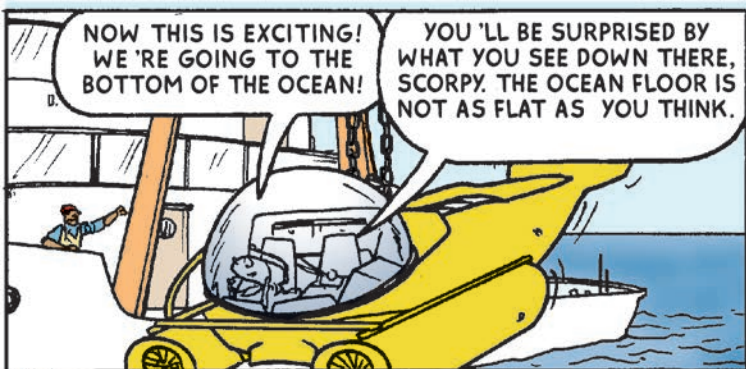
TODAY OCEANOGRAPHERS USE SHIP-
BASED SONAR TO GENERATE A SOUND
SIGNAL THAT IS BOUNCED - OR
"ECHOED" - OFF THE SEA FLOOR AND
THEN RECORDED BACK ON THE SHIP.
THIS IS A MUCH MORE ACCURATE WAY
TO MEASURE THE OCEAN'S DEPTH.



AND YOU
DON'T BONK
A WHALE ON
THE HEAD
WITH A HEAVY
WEIGHT!

NOW THIS IS EXCITING!
WE'RE GOING TO THE
BOTTOM OF THE OCEAN!

YOU'LL BE SURPRISED BY
WHAT YOU SEE DOWN THERE,
SCORPY. THE OCEAN FLOOR IS
NOT AS FLAT AS YOU THINK.



CONTINENTAL SHELF

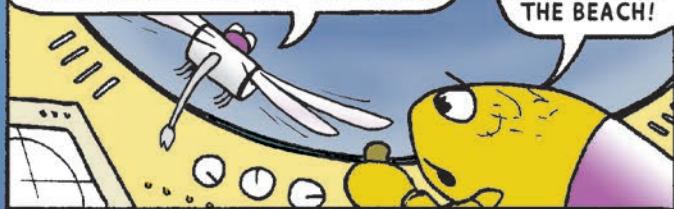
WOW! LOOK
HOW HILLY IT
IS! I HAD NO
IDEA HOW
MANY UPS
AND DOWNS IT
WOULD HAVE!

AT THE SHORELINE OF THE
LAND - THE **CONTINENTAL
MASS** - IS A PART UNDER
WATER CALLED THE
CONTINENTAL SHELF. IT
GOES OUT INTO THE OCEAN
ABOUT 43 MILES. THE SHELF
THEN SUDDENLY GIVES WAY
TO A MUCH STEEPER ZONE,
CALLED THE **CONTINENTAL
SLOPE**. THIS AREA DROPS
A WHOPPING 3,500 FEET!

CONTINENTAL SLOPE

FROM THE EDGE OF THE SLOPE, THE
BOTTOM BEGINS TO RISE AGAIN
GRADUALLY FOR ABOUT 370 MILES -
THAT'S THE **CONTINENTAL RISE**.
THEN IT'S THE **ABYSS** - THE DEEPEST
AND DARKEST PART OF THE OCEAN!

TOO DEEP FOR
ME! LET'S USE
THE OCEAN IN
MOTION TO
GET BACK TO
THE BEACH!



CONTINENTAL RISE

ABYSS

