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EARTH SCIENCE

地球科学

The Oceans Around Us 环绕我们的大洋

KATE BOEHM NYQUIST (美) 著

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致读者

如果你希望读到地道的英语，在享受英语阅读乐趣的同时又能增长知识、开拓视野，这套由外语教学与研究出版社与美国国家地理学会合作出版的“国家地理科学探索丛书”正是你的选择。

“国家地理科学探索丛书”分为9个系列，内容涉及自然科学和社会研究，秉承《国家地理》杂志图文并茂的特色，书中配有大量精彩的图片，文字通俗易懂、深入浅出，将科学性和趣味性完美结合，称得上是一套精致的小百科。

这套丛书以英文注释形式出版，注释由国内重点中学教学经验丰富的英语教师完成。特别值得推荐的是本套丛书在提高青少年读者英语阅读能力的同时，还注重培养他们的科学探索精神、动手能力、逻辑思维能力和沟通能力。

本丛书既适合学生自学，又可用于课堂教学。丛书各个系列均配有一本教师用书，内容包括背景知识介绍、技能训练提示、评估测试、多项选择题及答案等详尽的教学指导，是对课堂教学的极好补充。

本套丛书是适合中学生及英语爱好者的知识读物。



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Wading among tropical fish called palometas,
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The Call of the Ocean

大洋的呼唤



Adult green sea turtle¹ in the open sea

The baby green sea turtle struggles¹ to push her way out of her shell². In time, her tiny³ body breaks free. But the hard work has just begun. She is still buried⁴ deep in the sand. It will take several days of digging to reach the surface⁵. When she crawls⁶ out on the beach⁷, the danger will be even greater. Can she make it to the ocean⁸?

Most baby sea turtles don't survive⁹ the trip. Many creatures¹⁰ are waiting to pounce¹¹ on the little turtles as they struggle toward the water. Sometimes birds gobble¹² them up. Sometimes other animals, including humans, grab¹³ them for food. Even if the sea turtles make it to the ocean, they may not be safe. When they are small, sea turtles cannot dive¹⁴ for safety. They bob¹⁵ along, floating¹⁶ wherever the water takes them. Sometimes it takes them straight into the path of a hungry fish.



**Green sea turtle
hatching from egg**

But the sea turtle's home is the ocean, and she will risk¹⁷ everything to get to it. This is a book about the great oceans that provide¹⁸ a home to many different creatures. These oceans cover about 70 percent¹⁹ of Earth's surface and are essential²⁰ to life on this planet²¹. Even if you don't live near an ocean, you are greatly affected²² by these large bodies of salt water. So get ready, land dweller²³! A trip through the open ocean awaits²⁴.

1. struggle	v.	挣扎; 使劲	13. grab	v.	攫取; 抓住
2. shell	n.	(动物的)壳	14. dive	v.	潜水
3. tiny	adj.	极小的; 微小的	15. bob	v.	上下波动; 摆动
4. bury	v.	埋; 掩埋	16. float	v.	漂浮; 漂流
5. surface	n.	表面	17. risk	v.	冒……的危险
6. crawl	v.	爬行	18. provide	v.	提供
7. beach	n.	沙滩	19. percent	n.	百分之一
8. ocean	n.	大洋	20. essential	adj.	必不可少的; 非常重要的
9. survive	v.	经历……后继续存在	21. planet	n.	行星(此处指地球)
10. creature	n.	生物; 动物	22. affect	v.	影响
11. pounce	v.	猛扑; 突袭	23. dweller	n.	居住者; 居民
12. gobble	v.	贪婪地吃; 大口大口地吞	24. await	v.	等待

The Open Ocean:

Motion and Might

辽阔的大洋：运动与力量

Waves crash¹ hard on the rocks. Saltwater spray² flies high into the air. You can feel the ocean's strength³ just by standing next to it. Why does it feel so powerful⁴?

1. crash	v.	哗啦啦地猛冲直撞
2. spray	n.	浪花
3. strength	n.	力量
4. powerful	adj.	强有力的；强大的
5. lighthouse	n.	灯塔
6. Brittany		布列塔尼地区

**Waves crashing on
La Jument lighthouse⁵,
Brittany⁶ coast, France**

Part of the ocean's power comes from its size. All of the oceans are really big. Scientists estimate¹ that there are about 330 million cubic² miles³ of water in the oceans. There are four main oceans—the Atlantic⁴, the Indian, the Arctic, and the Pacific⁵. The largest and deepest is the Pacific Ocean. In fact, the Pacific Ocean is so big that if we could pick up all the land on Earth, we could fit it inside this one ocean.

Rivers of Water

The movement of ocean water has a great effect⁶ on Earth—and the oceans are always in motion. Did you know that there are rivers of water flowing through the oceans? That's right—water flowing through water. These huge rivers of water are called currents⁷. You can't see currents, but as any sailor⁸ knows, you can feel them move.

Strong rivers of water that move close to the surface of the ocean are called surface currents. The wind and the rotation⁹ of Earth create¹⁰ these currents.

When the baby sea turtle makes it to the water, she will probably head for the safety of a large surface current off the coast where she was born. Here the turtle can find a good food supply¹¹ while avoiding¹² the many enemies near shore. After floating around in this current for a few years, the turtle will grow big enough to defend¹³ herself against most predators¹⁴. Then she can go back to the waters near the coast.

1. estimate	<i>v.</i>	估计
2. cubic	<i>adj.</i>	立方的
3. mile	<i>n.</i>	海里
4. Atlantic		大西洋
5. Pacific		太平洋
6. effect	<i>n.</i>	影响；作用
7. current	<i>n.</i>	(空气、水等的)流

8. sailor	<i>n.</i>	水手
9. rotation	<i>v.</i>	自转
10. create	<i>v.</i>	引起；产生
11. supply	<i>n.</i>	供应；供给
12. avoid	<i>v.</i>	避开
13. defend	<i>v.</i>	保护
14. predator	<i>n.</i>	捕食者；食肉动物

Why do you think Earth is known as the blue planet?

Surface currents are important because they can help warm or cool land. Surface currents that flow from regions¹ near the Equator² carry warm water. Those that flow from the polar³ regions carry cold water. The map below shows the strong ocean current off the East Coast of the United States, called the Gulf Stream⁴. Do you think the Gulf Stream warms or cools the southeast coast of the United States?

Another kind of current found far below the surface of the water is called a deep ocean current. These currents form when very cold water meets warm water. The cold water sinks⁵ under the warm water, and this movement causes currents.

Tug-of-War⁶ With the Moon

If you've ever been to the ocean shore, you know that water slowly rises and falls along the beach every day. This change in water level is called the tide⁷. The baby sea turtle

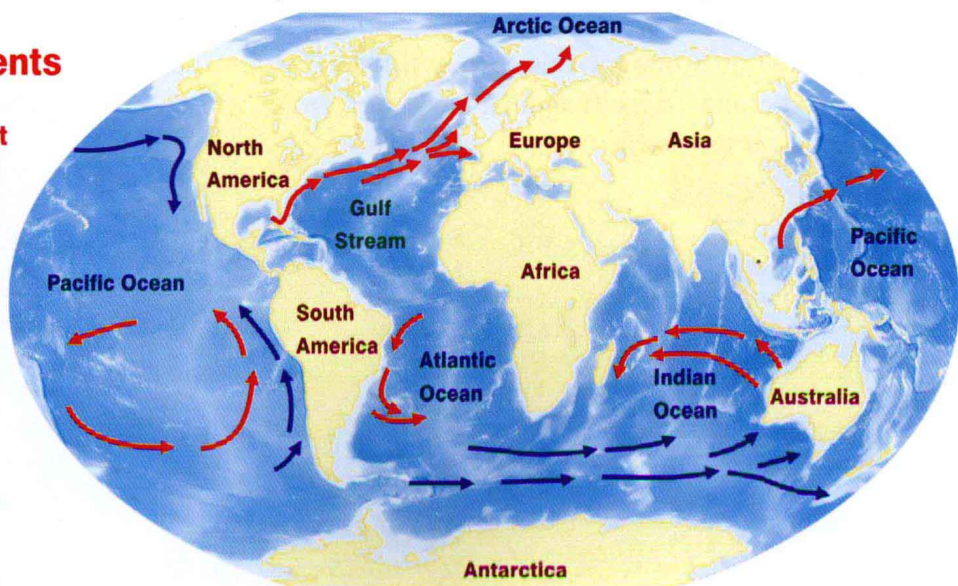
survived her dash⁸ across the beach to the ocean partly because of the tide. She made her run at high tide⁹, when the water was highest and closest to her nest¹⁰. So she had a better chance of making it to the water. What causes the ocean level to rise and fall with the tides? Believe it or not, it's mostly the pull of our moon.

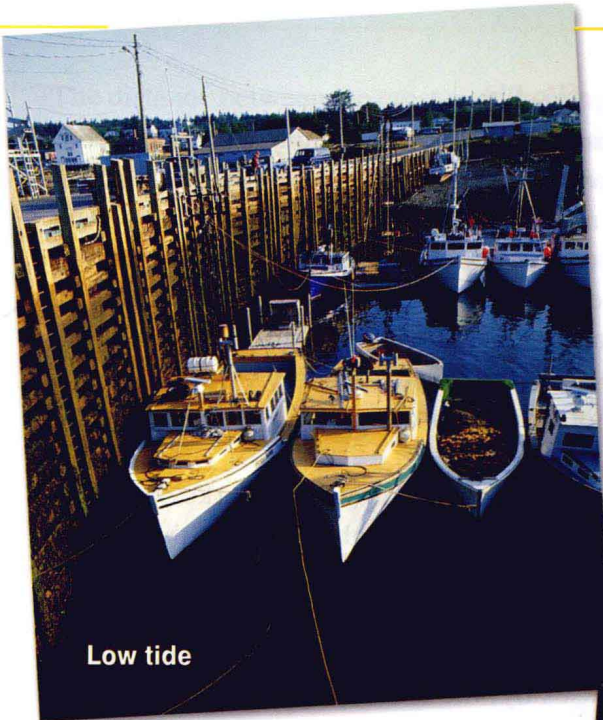
All objects¹¹ pull on each other. This pull is known as gravity¹². The side of Earth closest to the moon experiences¹³ a stronger pull than

1. region	<i>n.</i>	区域; 地方
2. equator	<i>n.</i>	赤道
3. polar	<i>adj.</i>	极地的
4. Gulf Stream		墨西哥湾流; 湾流
5. sink	<i>v.</i>	下沉
6. tug-of-war	<i>n.</i>	拔河
7. tide	<i>n.</i>	潮; 潮汐
8. dash	<i>n.</i>	猛冲; 飞奔
9. high tide		满潮
10. nest	<i>n.</i>	巢; 窝
11. object	<i>n.</i>	物体
12. gravity	<i>n.</i>	(万有)引力
13. experience	<i>v.</i>	经历

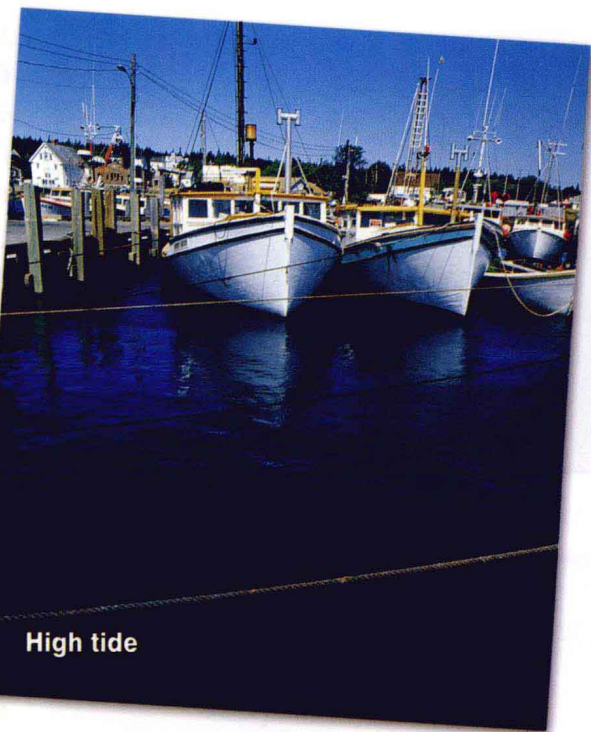
Surface Currents

→ Warm Current
→ Cold Current





Low tide



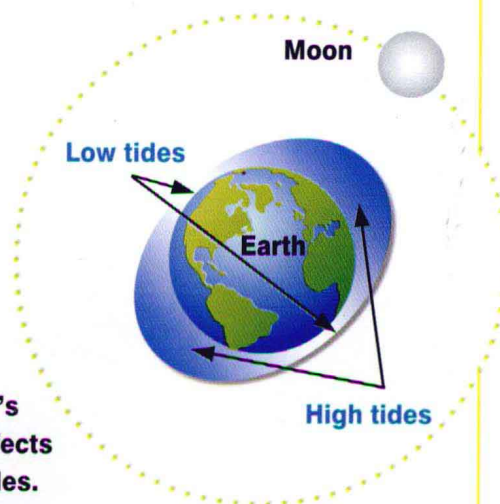
High tide

Boats rise and fall with the tides in Canada's Bay of Fundy⁶.

the side farthest from the moon. This is because the force of gravity gets weaker as distance¹ gets greater.

High tides occur² when ocean water bulges³ away from Earth. Rising water forms a tidal⁴ bulge on the side of the Earth closest to the moon. The moon's gravity pulls Earth's center away from the water on the side farthest from the moon. This causes another ocean bulge. The moon's pull holds the bulges in place while Earth rotates beneath them. A bulge forms a high tide. Where there is no bulge, a low tide⁵ occurs.

1. distance	<i>n.</i>	距离
2. occur	<i>v.</i>	出现
3. bulge	<i>v.</i>	鼓胀; 凸出
4. tidal	<i>adj.</i>	潮汐的; 受潮汐影响的
5. low tide		低潮
6. Bay of Fundy		芬迪湾



The moon's gravity affects Earth's tides.



1. Wave approaches¹⁰.



2. Ball rises as wave passes underneath .



3. Ball remains as wave continues.

Surf¹'s Up

Currents and tides make the ocean move, but waves breaking on the beach make the ocean fun. When you stand on the edge² of the ocean and look at the waves, it seems like the water is rolling in toward you. But the water is not really moving forward. What you see moving is wave energy³. And wave energy comes from the wind.

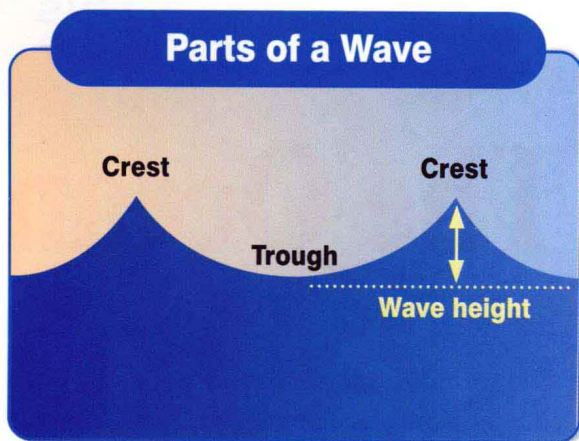
Let's think about how this works. As wave energy passes through the water, the energy makes particles⁴ of water move up and down. Look at the illustration⁵, at left, of a wave passing under a beach ball⁶. As the wave passes by, the ball bobs up and then down. But the ball doesn't continue to travel forward with the wave. That's because the wave energy moves the water that is under the ball up and down as it passes underneath.

So why can a wave knock you down at the water's edge? When a wave moves toward shore, the bottom of the wave, or the trough⁷, slows down because it meets the ocean floor. But the top of the wave, or the crest⁸, keeps moving. This difference in motion causes the wave to fall over, or break, onto the shore. If a wave is very large, it carries a lot of energy when it crashes onto land. Over time, waves can break up and carry away the rocks and sand that line the shore. Shorelines are constantly⁹ changing because of wave action.

(注释见第 11 页)

The distance between the crest and the trough of a wave is the wave's height¹¹. What's the biggest wave you've ever seen? Five feet? Ten feet? The sailors on the Navy¹² ship U.S.S. *Ramapo*¹³ once saw a wave taller than a ten-story building.

1. surf	<i>n.</i>	激浪
2. edge	<i>n.</i>	边缘
3. energy	<i>n.</i>	能量
4. particle	<i>n.</i>	粒子
5. illustration	<i>n.</i>	插图
6. beach ball		浮水气球
7. trough	<i>n.</i>	波谷
8. crest	<i>n.</i>	波峰
9. constantly	<i>adv.</i>	不断地; 不停地
10. approach	<i>v.</i>	接近; 靠近
11. height	<i>n.</i>	高度
12. navy	<i>n.</i>	海军
13. U.S.S. <i>Ramapo</i>		美国军舰瑞曼波号



What if the oceans didn't have currents, waves, and tides? How would that affect you?



Surfers riding a big wave



The Ocean Floor

海底风貌

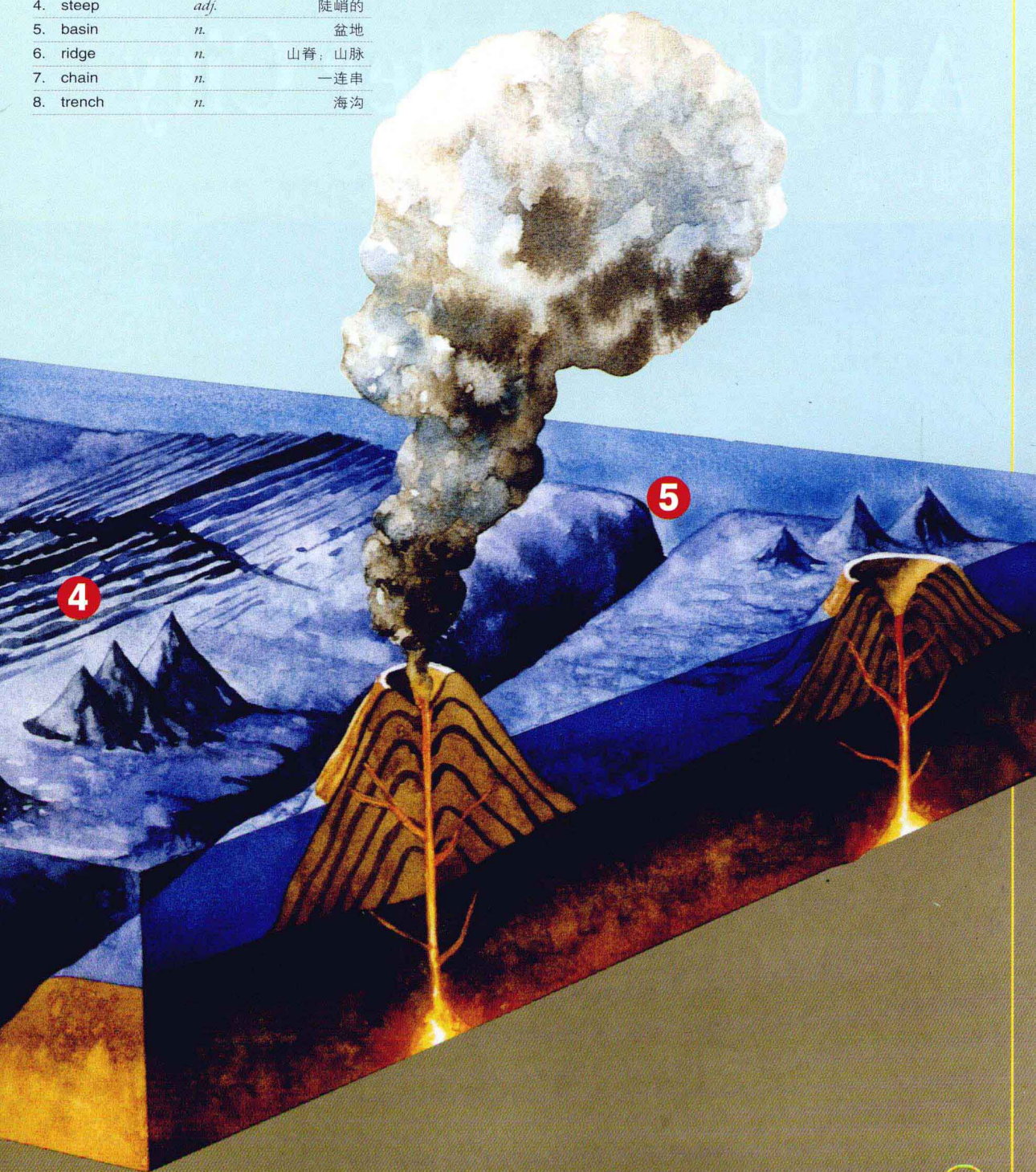
You might think the ocean floor is a flat surface. But it's really a lot like the land you see on Earth above water. Believe it or not, there are slopes¹, valleys, and even underwater mountains on the ocean floor.



- 1 Continental shelf²** — the underwater land around the edge of a continent
- 2 Continental slope³** — the steep⁴ slope leading down from the continental shelf toward the ocean floor
- 3 Ocean basin⁵** — the floor under the deep part of the ocean
- 4 Ocean ridge⁶** — a long chain⁷ of mountains found in some parts of the ocean basin
- 5 Trench⁸** — a deep, narrow valley in the ocean floor

(注释见第 13 页)

1. slope	<i>n.</i>	斜坡
2. continental shelf		大陆架
3. continental slope		陆坡
4. steep	<i>adj.</i>	陡峭的
5. basin	<i>n.</i>	盆地
6. ridge	<i>n.</i>	山脊; 山脉
7. chain	<i>n.</i>	一连串
8. trench	<i>n.</i>	海沟



The Coral Reef:

An Underwater City

珊瑚礁：海底城堡

1. school	<i>n.</i>	鱼群
2. stream	<i>v.</i>	流；涌
3. cabbage	<i>n.</i>	卷心菜叶形状
4. coral	<i>n.</i>	珊瑚

A school¹ of fish streams² over a field of cabbage³ coral⁴.