Unit 3 WATER POLLUTION

Text A Oil pollution in the oceans

On the subject of ocean pollution, it is traditional to quote Thor Heyerdahl. In 1947, he traversed the Pacific on his Kon Tiki expedition, without catching sight of people, ships or rubbish for weeks. On his second expedition in 1970, when he crossed the Atlantic with his boat the Ra II, he saw "far more oil lumps than fish." Heyerdahl concluded: "It became clear to all of us that man-kind really was in the process of polluting its most vital wellspring, our planet's indispensable filtration plant, the ocean."

But the oceans are so incredibly big that our impact on them has been astoundingly insignificant - the oceans contain more than 1,000 billion billion liters of water. The UN's overall evaluation of the oceans concludes: "The open sea is still relatively clean. Low levels of lead, synthetic organic compounds and artificial radionuclides, though widely detectable, are biologically insignificant. Oil slicks and litter are common along sea lanes, but they are a minor consequence to communities of organisms living in open-ocean waters". The lumps of oil are numerous. It is estimated that in 1985: 1) about 60 percent of the marine sources of oil pollution came from the routine tanker transport operation; 2) about 20 percent came from regular oil spills of the kind we see on TV; 3) about15 percent come from natural oil seepage at the bottom of the sea.

Routine oil pollution is due to the fact that tankers use sea water in their tanks as ballast when they sail without oil. The oil remnants get mixed into the ballast water, which on arrival gets flushed out into the harbor. Several international agreements have regulated and to a large degree reduced the extent of routine oil pollution. They demanded by law new techniques for the handling of ballast water, e.g. exploiting the fact that water and oil separate (ensuring that only the bottom layer of water is poured out on arrival), removing the last remnants of oil in the tanks (by cleaning the tanks with oil instead of water). They also demanded improved waste facilities in port and separate water ballast tanks.

Natural oil spills originate from cracks in the bottom of the sea above oil reserves. The mankind's exploitation of oil has relieved the pressure on many oil pockets and reduced the natural leak of oil. However, these two sources of oil pollution has not been documented over time.

Most tanker accidents occur close to land and the large spills affect the local fauna and flora. We are all familiar with the typical TV news scenario: oil-laden birds expiring before our eyes on the evening news, black-coated seals, the frantic cleanup efforts to avoid ecological catastrophe, and afterwards the massive bill.

Several reports begin to question whether these efforts are worth the hefty price tag.

The oil is a naturally occurring substance. During a short period, most of the oil will evaporate, degrade biologically and chemically, or form relatively harmless lumps of tar. The British official monitoring program in 1993 found that "by 1994 the contamination levels had fallen to the levels observed at sites remote from contamination."

VOCABULARY:

To traverse	Пересекать	Oil slick	Пятно нефти
Rubbish	Мусор	Sea lane	Морской путь
Oil lump	Большое количество нефти	Consequence	Последствия
Wellspring	Устье скважины, самоизлив нефти	Community	Сообщество, группа
Indispensable	Необходимый	Oil spill	Разлив нефти
Filtration plant	Оборудование для фильтрации	Oil seepage	Просачивание, выход нефти
Impact	Влияние	Sediment erosion	Размывание осадочной породы
Astoundingly	Поразительно	Ballast	Балласт
Compound	Компонент	Oil remnant	Остаток нефти
detectable	Обнаруживаемый	Flushed out	Прогонять, сгонять
Harbor	Гавань, порт	Extent	Пространство, расширение
To exploit	Эксплуатировать	To pour out	Выливать
Waste facilities	Оборудование по переработке отходов	To originate	Давать начало, порождать
To relieve	Помогать, освобождать	Leak	Утечка
Oil pocket	Нефтесборник	Presumably	Предположительно
Oil-laden	Отяжеленный нефтью	Frantic	Неистовый
To expire	Гибнуть	Price tag	Ценники на нефть
crack	Трещина	Hefty	Большой, огромный

EXECISE 1

Найдите переводы, соответствующие словосочетаниям на английском языке.

1. Sight of rubbish	A. Сливаться (быть слитым)
2. Routine tanker transport operation	B. Повседневная эксплуатация танкеров
3. To get flushed out	C. Остатки человеческой жизнедеятельности
4. Demanding by law	D. Потребовав от имени законодательства
5. To handle ballast water	E. утилизировать воду, использованную в качестве балласта
6. Exploiting the fact	F. Верхний слой
7. Extent of pollution	G. Расширение загрязнения
8. Bottom layer	H. Используя тот факт, что
9. Separate water ballast tanker	I. Танкер, спроектированный с раздельным размещением воды для балласта
10. Pressure on the oil pocket	J. Вымазанные нефтью тюлени
11. Natural leak	K. Естественная утечка
12. Black-coated seal	L. Давление на нефтесборники
13. Afterwards the massive bill	M. Огромные счета, получаемые впоследствии
14. Frantic cleanup efforts	N. Проникать из расщелин, образовавшихся на поверхности
15. To get mixed into	O. Вода и нефть не смешиваются друг с другом
16. Water and oil separate	P. Оправдывать высокую стоимость
17. To originate from cracks in the bottom	Q. Героические усилия по очистке
18. To be worth the hefty price tag	R. Смешиваться (быть смешанным)

EXECISE 2

Расставьте предложенные названия абзацев текста в правильном порядке:

- The natural properties of oil
- Our impact on the ocean
- Main sources of oil pollution
- Tanker’s operation and maintenance
- The places of big oil pollution

EXECISE 3

Добавьте в каждый абзац по предложению в соответствии с содержанием текста:

- It’s an integral part of our planet life.
- We need new technologies to provide environmentally safe operation of tanker transport.
- Don’t we pay too much for oil?
- We hope for the best.
- To sum up we can say that number of oil lumps increase.

EXECISE 4

Составьте фразы, соответствующие содержанию текста:

1.On the subject of ocean pollution, it is traditional to quote	Thor Heyerdahl.
	Charles Darvin.
	Jacques-Ives Cousteau.

2. The oceans are so incredibly big that our impact on them has been astoundingly	insignificant.
	important.
	considerable.

	numerous.
3. The lumps of oil are	insignificant..
	relatively few.

4. It is estimated that in 1985 about	60 percent	of the marine sources of oil pollution came from the routine tanker transport operation.
	40 percent	
	20 percent	

5. It is estimated that in 1985 about	40 percent	came from regular oil spills of the kind we see on TV.
	20 percent	
	5 percent	

6. It is estimated that in 1985 about	60 percent	come from natural oil seepage at the bottom of the sea.
	15 percent	

	80 percent	

EXECISE 4

Ответьте на следующие вопросы: 1. Please find and translate the opinion of Thor Heyerdahl. 2. What is the total picture of ocean pollution from different sources? 3. Please explain, how do the tankers pollute the ocean water? 4. What measures should be taken in order to avoid this pollution? 5. What are two main natural sources of oil pollution? 6. What consequences can the tankers' accidents result in? 7. Is oil a naturally occurring substance?

Text B Pollution in coastal waters

As far as people are concerned, one of the most relevant indicators of coastal water quality is its health risk. Water contaminated with bacteria, viruses, protozoans, fungi and parasites can cause ear or skin infections on contact. The inhalation of contaminated water can cause respiratory diseases. These pathogens typically live in the intestines of warm-blooded animals and are shed in their feces.

It is often difficult to analyze the presence of the many possible pathogens. Most regulations use concentrations of easily analyzed fecal bacteria as indicators of contaminated water. Earlier, contaminated water often came from unregulated sewers. Today, with well-regulated sewage treatment, most contamination happens because of sewage overflows and polluted storm water runoff.

Coastal waters are also the habitat for large populations of flora and fauna.

The most conspicuous problem is oxygen depletion – so called hypoxia - and algae blooms that occure in many parts of the world. This condition was described as the UN's main worry about coasts in the world:

"The rate of introduction of nutrients, chiefly nitrates but sometimes also phosphates, is increasing". The areas of eutrophication are expanding, along with enhanced frequency and scale of unusual plankton blooms and excessive growth. Two major sources of nutrients to coastal waters are sewage disposal and agricultural runoff from fertilizer-treated fields and from intensive stock raising.

VOCABULARY

Bacteria	Бактерия	Sewer	Сточная труба
Fungi	Грибки	Runoff	Наводнение
Protozoan	Простейшее животное	Sewage treatment	Обработка сточных вод

Parasite	Паразиты	Fecal	Фекальный
Inhalation	Ингаляция, вдыхание	Protein	Белок
Pathogen	Патогенный микроорганизм	Algae bloom	Цветение водорослей
Intestine	Кишечник	Conspicuous	Заметный
To shed	Сбрасывать	Depletion	Истощение
Feces	Фекалии	Hypoxia	Гипоксия
Eutrophication	Эутрофикация	Enhanced	Усовершенствованный

EXECISE 1

Ответьте на следующие вопросы: 1. What is the most relevant indicator of water quality? 2. What diseases can cause contaminated water? 3. What pathogens can be easily analyzed as indicators of contaminated water? 4. What do the contaminated water come from most often? 5. What is the importance of coastal waters? 6. What are the most conspicuous problems due to water contamination?

EXECISE 2

Найдите эквиваленты следующих выражений: что касается людей, передающаяся при контакте инфекция, трудно обнаружить присутствие, чаще всего происходить, переполнение стоков, затопление грязной водой в результате штормов, среда обитания больших популяций, легко исследуемые, большинство нормативных актов, основываться на показателе концентрации.

EXECISE 3

Составьте фразы, соответствующие содержанию текста:

1. As far as people are concerned, one of the most relevant indicators of coastal water quality is	its health risk.
	its chemical pollution.
	its clarity.

2.Most regulations use concentrations of easily analyzed	viruses	as indicators of contaminated water.
	fecal bacteria	
	protozoans	

3. The areas of eutrophication are	expanding.
	decreasing.
	the same.

Text C Health effects from fertilizer

Synthetic fertilizer has allowed a vast increase in food production. The Swedish Academy of Sciences awarded the Nobel Prize for Chemistry to Fritz Haber in 1919. They argued that Haber had created "an exceedingly important means of improving the standards of agriculture and the well-being of mankind."

Today, it is estimated that 40 percent of all crop nitrogen comes from synthetic fertilizer, and about one-third of human protein consumption depends on synthetic fertilizer. Moreover, fertilizer allows us to produce more food on less farmland. This is one of the reasons why the global population could double from 1960 to 2000 and get better fed, although farmland area only increased 12 percent. The extraordinary increase in fertilizer availability made possible to avoid a dramatic increase in human pressure on other natural habitats. If fertilizer use had

remained at 1960 level, we would need at least 50 % more farmland than the present day use – the equivalent of covering almost a quarter of the global forests.

Fertilizer makes up the main part (about 75%) of the extra nitrogen release.

The two global nitrogen problems are nitrous oxide contributing to global warming and ozone depletion. However, nitrous oxide's contribution to global warming is only about one-tenth that of CO_2. The latest nitrogen review concluded that "both fossil fuel burning and the direct impact of agricultural fertilization have been considered and rejected as the major source "of nitrous oxide.

In the 1980s nitrates in the groundwater came very much into focus. The Danish environment minister, Christian Christensen, stated flatly that nitrate pollution had serious consequences because:

"a clear relationship has been established between stomach cancer and high levels of nitrates in drinking water. And many infants are in direct danger because they get much of their water from their food. This can result in slow asphyxiation because excessive nitrate inhibits the blood's absorption of oxygen. Internal organs can also break down so that the children become ill or have difficulty concentrating. For this reason I do not dare to drink nitrate-polluted water and I will not allow my child to do so either."

Most of the nitrates we consume come from vegetables, especially beets, celery, lettuce and spinach, which can give us between 75 and 100 mg of nitrates a day – vegetarians get more than 250 mg.

The Hypoxia Assessment identifies two main "options to reduce the nitrogen load." First, fertilizer usage on agricultural lands could be reduced, both by a general reduction and through better fertilizer application and management, alternative crops and wider spacing of drains. Second, the creation of riparian zones and wetlands would diminish the nitrogen load. When water and nitrogen compounds flow through these areas, several microbiological processes turn significant amounts of the compounds back into N_2, effectively making it unavailable for further plant use.

VOCABULARY:

Nitrous	Азотистый	To dare	Решаться
Nitrogen	Азот	Celery	Сельдерей
Flatly	Категорически	Lettuce	Салат
Consequence	Последствие	Spinach	Шпинат
Infant	Ребенок	To space	Оставлять промежутки
Asphyxiation	Удушение	Riparian	Прибрежный

Excessive	Чрезмерный	Wetland	Заболоченная территория
To Inhibit	Запрещать	Absorption	Поглощение

EXECISE 1

Переведите следующие выражения: to come into focus, to have difficulty concentrating, wide spacing the drains, to make it unavailable.

EXECISE 2

Ответьте на вопросы: 1. Who did the Swedish Academy of Science award to the Nobel Prize for Chemistry in 1914? 2. What were the arguments of Swedish Academy of Science? 3. What is the main source of nitrogen? 4. Is fertilizer useful? 5.What are the two global nitrogen problems? 6. When did nitrates come into focus? 7. What are the consequences of nitrate pollution for our health? 8. Where do we consume nitrates from? 9. Identify, please, the main options to reduce the nitrogen load?

EXECISE 3

Найдите эквиваленты: обширный прирост в производстве продуктов питания; чрезвычайно важные средства; потребление белка человеком; вырасти в два раза; начать лучше питаться; территория сельскохозяйственных земель; лучшее использование удобрений; лучшее руководство процессом внесения удобрений; сделать недоступным; альтернативные зерновые культуры; превратить обратно в; прямое воздействие; стать центром внимания; подвергаться прямой опасности; трудно сосредоточиться.

EXECISE 4

Составьте фразы, соответствующие содержанию текста:

1. Synthetic fertilizer has allowed	a vast increase	in food production.
	a decrease	
	a small increase	

2. The Swedish Academy of Sciences awarded the	in 1914.

Nobel Prize for Chemistry to Fritz Haber	in 1991.
	in 1999.

3. Today, it is estimated that 40 percent of all crop nitrogen comes from	synthetic fertilizer.
	fossil fuel burning.
	the direct impact of agriculture.

4. Most of the nitrates we consume come from	vegetables.
	fruit.
	beverages.

5. Nitrates in the groundwater came very much into focus.	in the 1980s.
	in the 1990s.
	in the 2000s.

6. Fertilizer allows us to produce more food on	less farmland.
	more farmland.
	the same farmland.

7. The Danish environment minister, Christian Christensen, stated flatly that nitrate pollution had	serious consequences.
	insignificant consequences.
	unimportant consequences.

EXECISE 5

Согласны ли вы с кратким выводом по содержанию предыдущего текста:
Of course, to a certain extent we can use our fertilizer better and in the developed part of the world pay our way to avoid eutrophication, but we also need to ask whether this is the best allocation of our scarce resources.

Text D Pollution in rivers

From a global point of view, rivers are important because they are major suppliers of water for drinking, personal hygiene purposes, industry and agriculture. In as far as water is used to drink, it is absolutely vital that it does not contain too many coli bacteria, because this would indicate the presence of other, more serious bacteria and viruses.

The fecal pollution starts to increase. Rivers in Australia, Japan, and the US all have fairly high coliform levels. However, when countries get rich enough they

use groundwater to a much greater extent. It diminishes the urgency and political inclination to push for ever lower fecal pollution levels. Nevertheless, the conclusion remains true for the large majority of countries that depend on rivers for drinking water. At the outset richer means more polluted rivers, but beyond a fairly low level. Richer actually implies less fecal pollution in the rivers.

Biologically speaking, however, the level of oxygen is a much more important measure of water quality than fecal coliform. Dissolved oxygen is absolutely essential for the survival of all aquatic organisms - not only fish but also invertebrates such as crabs, clams, zooplankton, etc. Moreover, oxygen affects a vast number of other water indicators, not only biochemical but esthetic ones like odor, clarity and taste. Consequently, oxygen is perhaps the most well-established indicator of water quality.

We have only looked at typical pollution indicators, such as coliforms and oxygen. But equally important, we may want to look at the aquatic levels of chemical pollution. Here we see the same pattern as in the coastal areas. In the US, a National Contaminant Biomonitoring Program has examined the presence of long-lived toxic contaminants in the aquatic environment through analysis of fish. Fish were selected because they tend to accumulate pesticides. The European starling was chosen because of its varied diet and wide geographic distribution.

Summing up rivers probably experience better water quality as income increases. This tendency towards improved oxygen levels has also been confirmed when analyzing more than 200 European rivers. Moreover, general quality measures for both the UK and the US show better river water quality. Persistent pollutants in fresh waters have been decreasing dramatically. When measured nationally through fish in the US or through herring gull eggs in the Great Lakes, pollutant concentrations have declined 80-90 percent.

VOCABULARY:

Fecal coliform	Фекальные коли-бактерии	Fairly	Довольно, в некоторой степени
Coli bacteria	Коли-бактерии	Hygiene	Гигиена
Virus	Вирус	Dissolved	Растворенный
Urgency	Безотлагательность	Aquatic	Водяной
Inclination	Склонность, тенденция	Contaminant	Загрязняющее вещество
To push for	Настаивать	Clam	Морской моллюск
Nevertheless	Тем не менее	Odor	Запах
At the outset	Вначале	Clarity	Прозрачность
Beyond	В пределах, вне	Pattern	Образец

Pesticide	Пестицид	Invertebrate	Беспозвоночные
Starling	Скворец	Herring gull	Серебристая чайка

EXECISE 1

Переведите следующие выражения: lower fecal pollution levels, we may want to look.

EXECISE 2

Ответьте на вопросы: 1. Why are rivers important? 2. Why is it vital to determine the continence of coli bacteria in water? 3. Do the rich countries pollute less their rivers? 4. What are two important measures of water quality? 5. What is the second important measure of water quality? 6. Why does oxygen affect a vast number of water indicators? 7. What are esthetic indicators of water quality? 8. How can we determine the aquatic levels of chemical pollution? 9. How has a National contaminant Biomonitoring Program examined the presence of long-lived toxic in the aquatic environment? 10. What is the interconnection between the water quality ant the increased incomes? 11. What is the main tendency of the last decades?

EXECISE 3

Найдите эквиваленты: в большом масштабе, настаивать на, с мировой точки зрения, для целей личной гигиены, уровни загрязнения воды химикатами, основной поставщик, намного более важный, самый признанный, устойчивый, токсичные загрязнители, разнообразная диета, подводя итоги, постоянные загрязнители, иметь склонность к накоплению, говоря с биологической точки зрения, большое количество.

EXECISE 4

Составьте фразы, соответствующие содержанию текста:

1. It is absolutely vital that water does not contain too many	coli bacteria.
	viruses.
	oil.

2. Dissolved oxygen is absolutely essential	for the survival of all aquatic organisms.

	for our well-being.
	for coli bacteria.

3. Esthetic indicators of water quality are	odor, clarity and taste.
	dissolved oxygen.
	coli bacteria.
4. Fish were selected because they tend to accumulate	pesticides.
	nitrates.
	oxigen.