

# Climate

By Takashima Hatsuhisa

With an area of 670 km<sup>2</sup>, Lake Biwa is Japan's largest lake, located almost in the very center of Japan. Although only 1/120th of the size of Lake Superior in the North American continent, the world's largest freshwater lake, Lake Biwa is an important source of water for the 14 million people who live in the Kyoto-Osaka-Kobe area, which has the second highest population density in Japan. Recently I heard that something strange was happening to Lake Biwa. The water that fills Lake Biwa flows in from more than 120 rivers. The water from these rivers does not simply pour into the lake; apparently it also plays another very important role.

Not only does it constantly fill the lake with fresh water containing plenty of oxygen, but the water, particularly the cold melted snow that flows down from the mountains to the north and the east from early spring through to summer, sinks to the bottom of the lake and has the effect of gently stirring the 27.5 billion tons of water in Lake Biwa. Thanks to this effect, Lake Biwa never becomes stagnant and is thus able to support a large variety of living creatures.

However, when I spoke to Nunotani Tomoo, the senior research scientist at Lake Biwa Museum, recently, he told me that the volume of melted snow pouring into Lake Biwa has fallen because there was less snow on the mountains this year, and that this was hindering the natural stirring effect. Although the effect of this phenomenon on the ecosystem of the lake is yet to be known, it gives another alarming sign of the worsening of global warming.

Japan's climate this year has, in fact, been very strange. Niigata Prefecture, which is located along the Japan Sea about two hours north of Tokyo on the *Shinkansen* Bullet Train, is eloquent proof of that. Another commonly used

name for Niigata is "snow country." The combination of the cold air blowing across from Siberia and the moist air from the Japan Sea causes heavy snowfalls in Niigata every winter. When I was a teenager, my father was transferred alone to Niigata, and I used to visit him there every holiday, enjoying the changes of the four seasons. What impressed me most was the winter. As the train from Tokyo entered Niigata after passing through a long tunnel, the view from the train window was suddenly filled with a world covered in white snow, and every time, I felt that I had truly arrived in "snow country."

At that time, incidents such as traffic standstills or fatal building collapses caused by heavy snowfall in Niigata seemed to appear on the news every winter. Apart from the prefectural capital, Niigata City, even towns in inland Niigata were often covered in such deep snow that residents had to get into and out of their houses from the windows of the second floor.

This winter was different, however. Little snow fell all winter, and in March, Niigata City recorded zero snowfall, an extremely rare phenomenon that had never occurred since the meteorological observatory was first established. This shortage of snowfall caused major problems at ski grounds all over Niigata Prefecture. Gala Yuzawa, which is only an hour from Tokyo by Shinkansen, is famous for the length of its ski season, with large numbers of skiers still flocking there in Golden Week, the string of public holidays in late April-early May every year. This year, however, only 1.5 meters of snow was recorded in mid-April, which is over a meter less than last year. To make matters worse, the snow kept melting and turning into a sherbet-like slush, so the resort decided not to wait for Golden Week this year,

closing its doors on April 21.

Such a shortage of snowfall is obviously caused by rising atmospheric temperatures. According to the Niigata Local Meteorological Observatory, the average temperature in Niigata City this March was 7.7°C, which is 2.3°C higher than the average and the highest since observations began in 1886. Niigata is not the only area to experience these high temperatures.

This year, 103 of Japan's 149 meteorological observation points – around two-thirds of the total – recorded their highest ever average temperatures for March. This phenomenon of record-breaking high temperatures has continued since January this year, and Niigata also marked its highest ever average temperature in April as well.

As a result, from winter through to early spring, the entire Japanese archipelago was awash with tales of both joy and sorrow regarding the warm winter. Because the cherry blossoms came out extraordinarily early this year, by the time the cherry blossom festivals started in towns across the country, the blossoms were long gone and people had to hold their "blossom-viewing" parties under leaves instead of flowers. In Hokkaido, the brown bears came out of hibernation two months earlier than last year, forcing police to rush to release warnings. The first picking of this year's tea, which is meant to begin on the 88th day from the beginning of spring (May 2 this year), started on around April 20, so tea plantation farmers were in a panic to secure enough tea pickers in time.

The warm winter was not only Japan's problem, instead stretching across a wide area covering Asia and Europe, with the high temperature phenomenon, a once-in-30-years occurrence, being recorded in all parts. In Siberia, heavy flooding happened frequently because of melting snow and

ice, and in the Himalaya Mountains, the risk of water from melted glaciers flooding into towns is growing. In the South Pole, there is concern that the collapse of a huge ice shelf may cause a major decline of krill, which is the diet of whales, seals and penguins of the Antarctic Ocean, and in the North Pole, the habitat of the polar bear is also apparently at serious risk.

Why are these phenomena occurring? The President of the United States, George W. Bush and some others would beg to differ, but most people in the world seem to feel that it is human activity that must be the cause of global warming. According to the World Watch Institute in the United States, in 1950, total global emissions of carbon dioxide (CO<sub>2</sub>), which is believed to be the cause of global warming, amounted to less than two billion tons yearly (converted into carbon), but in 2000, only half a century later, they exceeded six billion tons. The 1990s, the last decade of the 20th century, was the Earth's warmest decade in recorded history, and even the Intergovernmental Panel on Climate Change (IPCC) recognizes that human activity is the main cause. If things go on as they are, it is predicted that the average temperature of the Earth will rise by as much as 5.8°C by the end of the 21st century, rising sea levels will cover many island nations, including Tuvalu in the South Pacific, and many large seaboard cities such as Tokyo will be washed by high waves.

The Kyoto Protocol was adopted in December 1997 for the purpose of stopping this trend and to save the Earth from catastrophe. It involves the reduction of emissions of six kinds of greenhouse gases, including CO<sub>2</sub>, methane and nitrous oxide, by each country to protect the earth from global warming. It includes mid-term targets to be attained from 2008 to 2012, namely a reduction of at least 5% compared with 1990 emission levels by all of the industrialized countries as a whole, and individual targets of 6% for Japan, 7% for the United States and 8% for the European Union (EU).

Japan and the EU have already rati-

fied this Protocol, but the United States, which has the highest level of CO<sub>2</sub> emissions in the world, rejected the ratification as soon as the Bush Administration came to power.

While it may be very difficult for the immediate future, further diplomatic efforts to bring the United States into the fold of the worldwide approaches to prevent global warming will be required.

Apart from this, this year's abnormal weather from winter to spring has had the effect of raising concern about the global warming issue among the Japanese public. A website to introduce the 115 countermeasures compiled by the government's Global Warming Prevention Headquarters has become very popular. It gives various suggestions for the general public to help reduce CO<sub>2</sub> emissions in daily life. For instance, if each family member cut his or her shower time by one minute each day, this would cut CO<sub>2</sub> emissions by as much as 930,000 tons. Watching television for one hour less every day will reduce CO<sub>2</sub> emissions by between 190,000 and 350,000 tons. Taking one's own shopping bag to the supermarket and buying vegetables with less packaging will reduce CO<sub>2</sub> by 830,000 tons.

People are reacting positively to these suggestions, and in Japan today, energy-saving electrical appliances have become very popular. According to a public opinion poll, more than 70% of respondents answered that they are always conscious of environmental issues and try to buy refill packs with little packaging when they buy shampoos and detergents.

In industrial circles as well, with memories still fresh in their minds of the way in which they overcame the oil crises of the 1970s by developing energy conservation technologies, companies are strengthening their position that they will make the development of

Photo: Tokyo Office of Tourism and Industry (Shiga Prefectural Department)



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technologies for the prevention of global warming the foundation of the revival of Japanese industry and new economic development.

As I write this essay in early July, the heat of summer has already struck Tokyo, and it is far worse than the warm winter. In addition to global warming, the "heat island" effect, which is characteristic of big cities, has made Tokyo summers almost tropical over the past several years. For someone like me, who is overweight, covered with layers of subcutaneous fat and perspires easily, summer in Tokyo can only be described as hell. Nevertheless, the sight of me commuting to the office every morning wearing a long-sleeved shirt and tie, holding my suit jacket under my arm, is more comedy than tragedy. If, as some people say, summer continues to get hotter and hotter every year until eventually the Japanese Islands become a subtropical zone and the habitat of malarial mosquitoes, then the day may come when I can no longer live in this country. To delay such a fate for as long as possible, I will read the document, "115 Things that You Can Do to Stop Global Warming" once more, and try to put as many of them into practice as I can. **JTI**

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