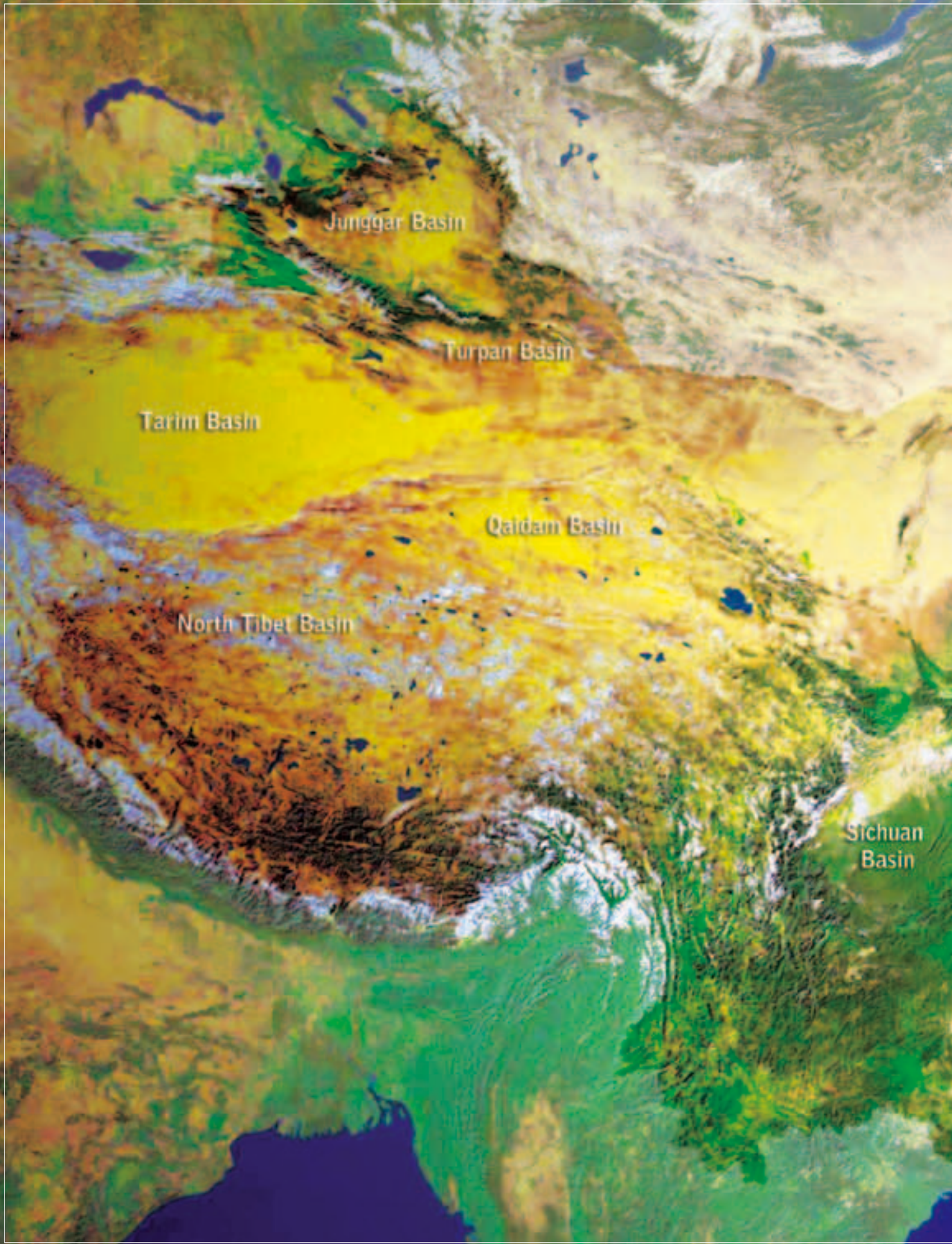




Songliao Basin



China National Petroleum Corporation



Junggar Basin

Turpan Basin

Tarim Basin

Qaidam Basin

North Tibet Basin

Sichuan Basin



Spread across the vast territory of China are hundreds of basins, where developed sedimentary rocks originated from the Paleozoic to the Cenozoic eras, covering over four million square kilometers. Abundant oil and gas resources are entrapped in strata ranging from the eldest Sinian Suberathem to the youngest quaternary system. The most important petroliferous basins in China include Tarim, Junggar, Turpan, Qaidam, Ordos, Songliao, Bohai Bay, Erlian, Sichuan, North Tibet, South Huabei and Jiangnan basins.

There are also over ten mid-to-large sedimentary basins along the extensive sea area of China, with those rich in oil and gas include the South Yellow Sea, East Sea, Zhujiangkou and North Bay basins.

These basins, endowing tremendous hydrocarbon resources with various genesis and geologic features, have nurtured splendid civilizations with distinctive characteristics portrayed by unique natural landscape, specialties, local culture, and the people.

In China, CNPC's oil and gas operations mainly focus on nine petroliferous basins, namely Tarim, Junggar, Turpan, Ordos, Qaidam, Songliao, Erlian, Sichuan, and the Bohai Bay.



The Songliao Basin is a large terrestrial sedimentary basin surrounded by the Greater Khingan, Lesser Khingan and Changbai mountains in Northeast China. It spans 260,000km² across the provinces of Heilongjiang, Jilin, and Liaoning, and is crossed by the Songhuajiang and Liaohe rivers.

Songliao Basin

Geography and Geology

The Songliao Basin is situated in a humid and semi-humid region in the frigid-temperate and temperate zones of China. A cold and humid forest, meadows, and grassland comprise its landscape. It is a sedimentary basin in terms of geology, having lowland landform characterized by high surroundings and a low center. The basin is surrounded by mountains and hills, with the Zhangguangcai Mountains to the east, the Greater Khingan Range to the west, the Kangping-Faku hill zone to the south, and the Lesser Khingan Range to the north. Within the basin are the vast plain and swamps of the Nenjiang-Songhuajiang river system and the Liaohe river system.

The Songliao basin originated between the late phase of Indosinian movement and the early stage of Yanshan movement. Its development stage was between mid-late Yanshan movement and early Himalayan movement. The basin is mainly surrounded by outcrops of metamorphic rocks and volcanic rocks of the Paleozoic and Prepaleozoic eras. Within its border, Cretaceous strata are widely distributed under the Cenozoic strata. A tremendous black treasury is buried here – the Daqing and Jilin oilfields.



Resources

Nearly 100 minerals have been proven in the Songliao Basin. These include petroleum, oil shale, borax, and talc that account for more than a half of China's total amount, and coal reserves accounting for about 1/10 of the national total. The basin has a rich reserve of oil and oil shale. In fact, it accounts for more than half of China's already proven oil reserves.

The fertile Songliao Basin is famous for its "black soil" that boasts enriched humus and excellent aeration and water storage. This is why it has become an important production area for soya, broomcorn, maize, wheat, beet and flax. Rice is also grown in the basin, and it is one of the most important production areas for early keng rice in China.



Greater Khingan Range



The Greater Khingan Range is situated in the north of Heilongjiang Province and the Inner Mongolia Autonomous Region, dividing the Inner Mongolian Plateau from the Songliao Plain. It stretches from the bank of the Heilongjiang River in the north and ends at the upstream valley of the Xilamulun River in the south. The range extends more than 1,200km from northeast to southwest, is 200-300km in width, and is 1,100-1,400m above sea level.

The north of the mountain range is completely covered by dense primeval forest in which one can hardly see the sky. This forest belt is wider in the north and narrower in the south. It spans a latitude range of 7° in 250,000km², about 62% of which is covered by forest. The region contains more than 390 wild animal species and 966 plant species. In addition to the tremendous underground mineral resources, it boasts 4 million mu of usable natural rangeland and a 710km² catchment area.

The Greater Khingan Range produces many types of quality timber such as Korean pine and Manchurian ash. Larch, birch, and aspen poplar are among the major tree species. In the dense woods, trees have to grow upwards to receive most sunlight. This is why they are often straight and tall enough to be superior building materials. Some big trees can be as tall as more than 60m but still have trunks as straight as a mast.

The Greater Khingan Range has beautiful scenery. In spring and summer, red azaleas are everywhere and verdant forests are full of sweet smells, ideal for summer visitors and those who wish to experience polar nights. In the autumn, under the high sky and light clouds, there are forests glowing with autumn tints as far as you can see. At this time, you can harvest bilberry (northern China love pea), blueberry, hazel, prunus padus, and dwarf apple, which are just like strings of pearls all over the mountains, as well as many precious Chinese herbs. In winter, the thousand-hectare forest is covered by snow, forming a crystal clear world.



Lesser Khingan Range

The 500km-long Lesser Khingan Range is the collective name of all mountains to the north of Songhuajiang River. It joins Yilehuli Mountain in the northwest and reaches the Songhuajiang River in the southeast. Opposite to the Greater Khingan Range to the west, it runs through the mid-north part of Heilongjiang Province, and separates the Heilongjiang River from the Songhuajiang River.

The range covers 130,000km², about 37% of which is low mountains, 53% is hills, and about 10% is shallow hills and tableland. The elevation is between 500m to 800m. It's one of the major forest areas in China, with a 12.06-million-hectare forest area that stores 450 million m³ of timber.

The Lesser Khingan Range has Korean pine and many other precious tree species. More than 43 million m³ of Korean pine are here, accounting for more than a half of the national total. This is why it is renowned as "the homeland of the Korean pine". In addition, larch, Mongolian scotch pine, and the



three major broadleaf species, namely Manchurian walnut, Manchurian ash, and cork tree, also live here.

In the mountainous forests more than 320 wild herbs grow, such as ginseng, manyprickle acathopanax root, codonopsis, and astragalus; more than 30 wild mountain nuts and fruits such as pine nut, hazel, carya cathayensis sarg., and kiwifruit; and more than 20 wild mountain vegetables such as monkey-head mushroom, agaric, and wild brake.

The forests and valleys of the Lesser Khingan Range are the habitat of more than 50 animal species such as the North Chinese tiger, red deer, moose, black bear, wild boar, lynx, hare, squirrel and weasel, and more than 220 birds like the hazel hen, thunder bird, Chinese merganser, golden eagle, woodpecker, owl and cuckoo.





North Chinese Tiger

The North Chinese tiger (*Panthera tigris altaica*), also known as the Siberian tiger, is found in northeastern Asia, including the Siberian region of Russia, Korea, and Northeast China. After three million years of evolution, it has become the biggest of the recent tiger subspecies. A male can measure 3 meters and weigh nearly 350kg, with a tail as long as about 1 meter. Its fur appears brownish yellow in the summer and light yellow in the winter.

The North Chinese tiger often inhabits mountainous coniferous forests or coniferous-deciduous complexes at an altitude of 500-1,200m and primarily feeds on wild boars, red deer, and roe deer. They often sleep in forests in daytime and prey at twilight in an area of more than 100km².

Fewer than 20 North Chinese tigers currently live in the wild in China out of about 400 in the world. The tiger is included in China's List of Animals under Class I Protection and has been listed in the appendix of the Convention on International Trade in Endangered Species (CITES). Heilongjiang Province has built the world-largest forest park for them, where there were more than 900 North Chinese tigers by the end of 2009.





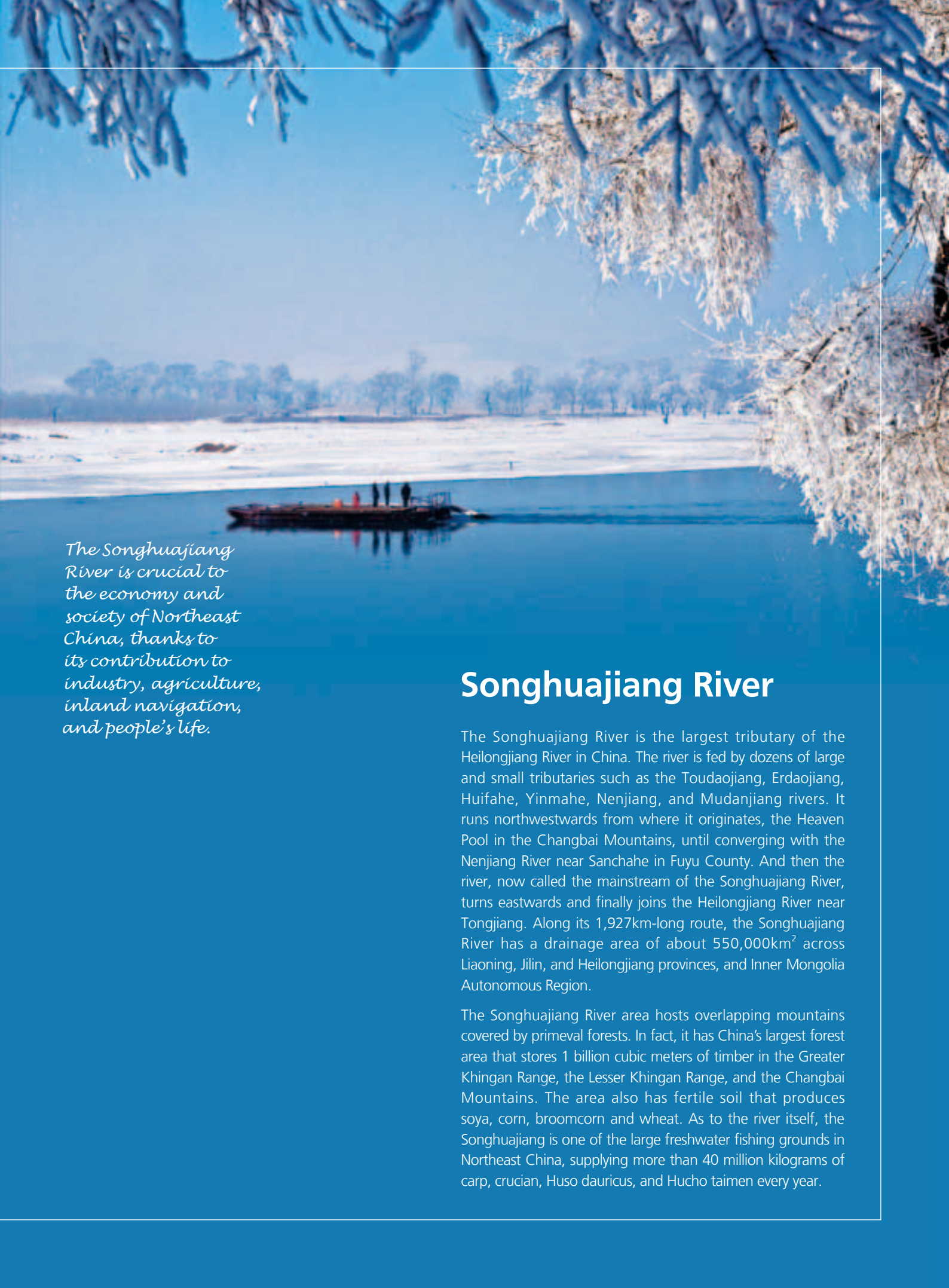
Wudalianchi (five connected lakes) covers an area of 1,060km² in the mid-north part of Heilongjiang Province, where the Lesser Khingan Range transfers to the Songhuajiang-Nenjiang Plain.

Wudalianchi

New and old volcanic landforms here are the best preserved and concentrated in the world. They also boast various types and typical shapes. There are 14 scenic volcanic cones standing in different postures. These have been named a “natural volcano museum” and a “volcanic textbook” by scientists.

A landscape of volcanic landform is presented by peaks standing next to the water, reflected in the five smaller lakes linked to one another like pearls. The thousands of well-developed and preserved jet cones create a wonder that can be seen in no other place in the world.





The Songhua River is crucial to the economy and society of Northeast China, thanks to its contribution to industry, agriculture, inland navigation, and people's life.

Songhua River

The Songhua River is the largest tributary of the Heilong River in China. The river is fed by dozens of large and small tributaries such as the Toudao River, Erdao River, Huifahe, Yinmahe, Nen River, and Mudan River. It runs northwestwards from where it originates, the Heaven Pool in the Changbai Mountains, until converging with the Nen River near Sanchahe in Fuyu County. And then the river, now called the mainstream of the Songhua River, turns eastwards and finally joins the Heilong River near Tongjiang. Along its 1,927km-long route, the Songhua River has a drainage area of about 550,000km² across Liaoning, Jilin, and Heilong provinces, and Inner Mongolia Autonomous Region.

The Songhua River area hosts overlapping mountains covered by primeval forests. In fact, it has China's largest forest area that stores 1 billion cubic meters of timber in the Greater Khingan Range, the Lesser Khingan Range, and the Changbai Mountains. The area also has fertile soil that produces soya, corn, broomcorn and wheat. As to the river itself, the Songhua is one of the large freshwater fishing grounds in Northeast China, supplying more than 40 million kilograms of carp, crucian, *Huso dauricus*, and *Hucho taimen* every year.



Wetlands

Wetlands, the “Kidney of the Earth”, are one of the three ecosystems of the world, with the other two being forests and oceans. As a unique ecosystem produced by water-land interaction, they are fundamentally characterized by seasonal or permanent water pools, and the growth or inhabitation of hygrophilous animals and plants. This is why wetlands are the most bio-diversified ecoscape of nature and one of the most important living environments of human beings.

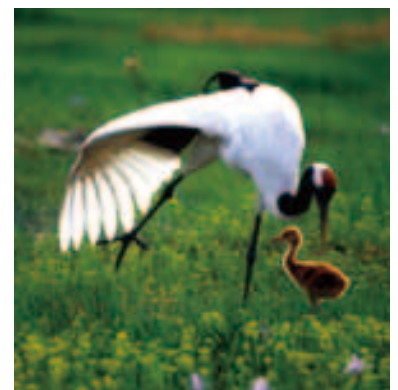
With a developed water system, the area drained by the Songhuajiang and Liaohe rivers boasts abundant wetland resources, most of which are distributed mid-to-downstream of the Nenjiang River and on the Three-river Plain formed by the Songhuajiang, Heilongjiang and Wusulijiang rivers. As one of the major homes of wetlands in the country, it contains ecologically crucial wetlands that are the largest in China.

Zhalong Wetland

Zhalong Wetland is China's largest wetland nature reserve of rare birds, most of which are cranes and other water fowl. Located 26 km southeast of Qiqihar City in western Heilongjiang Province, its 210,000 hectares contain a wetland ecosystem that is the best conserved and the most primitive and expansive across its latitude in northern China.

With luscious reed and grass flourishing in a vast area of swamps and numerous lakes, the reserve is teeming with fish and shrimp. Its peaceful and beautiful landscape is home to more than 150 species of birds, including a great number of species of cranes, making it the “home of cranes”.

Zhalong is primarily a reserve of the precious red-crowned cranes and wetland ecology. Each April to May, more than 200 red-crowned cranes and other water birds come and breed here, and nearly 1,000 white cranes visit on their northward migration to Russia. Red-crowned cranes mostly inhabit reed swamps and *Carex tatos*. The 1m-to-3m-high reed is inaccessible to human beings, becoming an ideal place for the living and breeding of these precious water birds. In fact, more than 100,000 economically valuable wild birds can be hatched here each year.





Daqing Wetland

Besides petroleum, the wetland is another treasure that nature has bequeathed to Daqing. The Daqing wetland covers 1.2 million hectares, accounting for nearly 60% of the total land area in Daqing city.

The wetland has been developed from slow-flowing rivers and streams, ponds, fresh lakes, and adjacent swamps. It satisfies all the standards to qualify as a wetland, and is a unique wetland with special animals and plants, and a habitat of many water birds.

In addition to the many lakes and swamps, the wetland also contains grasslands, meadows, a natural secondary forest, natural shrubs, artificial forests, and sand land. All these form many magnificent views over the land. In early summer, it is green everywhere. The swinging reed and flying birds make you feel you are in an oasis in a city.





Culture and Customs

A total of 43 ethnic groups inhabit the Songliao Basin. In addition to Han, the primary group, there are also Manchu, Korean, Mongolian, Hezhe, Oroqen, Daur, Xibe, etc. All these groups have their unique characteristics in customs and cultural heritage that form varied local charms.

Hezhe Ethnic Group

The Hezhes are an old ethnic group and one of the smallest in China, with a population of 4,600 across the country. They live on the “Three-river Plain” that the Songhuajiang River has formed at its downstream area together with the Heilongjiang and Wusulijiang rivers, in addition to Wanda Mountain.

The Hezhe language has no written form. Shamanism is their religion. Hezhe people have a wealth of folk tales. In their long history, myths, legends, and folk songs and tales have been passed from generation to generation.

The Hezhes live mainly by hunting and fishing. They love fish, especially raw fish. This custom remains unchanged to this

day. Their clothing is primarily made of fish skins, and roe and deer hides.

Hezhe people boast developed pattern arts. They often embroider patterns of clouds, flowers, grass, butterflies, and geometrical designs on fish-skin or animal-hide clothes, shoes, hats, and bedding. They also carve lively, aesthetic, and delicate patterns of two-side continual-border designs, cloud-shaped designs, landscape, flowers, birds, and beasts on tableware and birch bark products. Women even embroider beautiful patterns with color thread on their blouses, shawls, wallets, hats and trouser cuffs.



Northeast Yangge

“Yangge” is a collective term for folk dances in Northeast China, including yangge, dragon dance, land-boat dance, flap-butterfly dance, er-gui wrestling, Manchu huagun yangge, and stilt dance that are mostly performed together. It is an amusing folk entertainment.

In Northeast China, people perform yangge everywhere in towns and villages to celebrate the Spring Festival. Audiences love the enthusiastic, joyful, humorous, and wild music of the suona, gong and drum, flourishing scenes, rich dancing expressions, attractive actions, and its agile and free performance style.

The Northeast Yangge is famous for its exciting, jaunty and exuberant atmosphere. The graceful movement, extensive waist

swing, strong rhythm, and impressive expression are a reflection of the local people who are straightforward and ardent. In addition, yangge features flexible and novel formations. In addition to the normal circle pattern, dancers in fresh colors move in many other forms - quick and slow, and change “on the fly” – just to dazzle your eyes. The most superb part of yangge is performed on 0.7-1m-long stilts in yangge steps and formations. A more skilled performer can swing quicker and appear more vibrant. Previously, all yangge performers were men. Therefore, most female characters were impersonated by males, who were more daring and funny in their performance.







The Songliao Basin experienced massive oil and gas exploration and development in the 1950s. In 1959, industrial oil flows were successively obtained from well Songji-3 and Fu-27 in Daqing. This not only commenced the oilfield development of the basin, but also ushered in a new era in the growth of China's petroleum industry. After more than half a century of development, the basin has become one of the most important oil-producing regions in China.

Discovered in 1959 and put into development in 1960, Daqing oilfield is the largest oilfield of China and one of the few super large sandstone oilfields in the world. It is located in the mid-western part of Heilongjiang Province and the northern part of the Songhuajiang-Nenjiang Plain, and consists of 52 oil and gas fields such as Saertu, Xingshugang, Lamadian and Chaoyanggou across an area of 6,000 km².

The discovery and development of the Daqing Oilfield proves that terrestrial strata did generate oil and give birth to large oilfields. This not only introduced a new domain and thrust to the theory of petroleum geology, but also vitalized China's petroleum industry and greatly affected its industrial development. By the end of 2009, the oilfield had produced 2 billion metric tons of crude and the recovery rate of its major oilfields had exceeded 50%, 10-15% higher than any other oilfield of the same type at home and abroad. The field has produced more than 50 million tons of oil in each of the 27 years after 1976, and more than 40 million tons in each of the 8 years that followed, a miracle in the development history of similar oilfields in the world.



Daqing – A Petroleum City Grown up from a Wasteland

Daqing City is situated in a place that was a vast wasteland until half a century ago. Its birth was attributable to the discovery of the giant Daqing Oilfield that was marked by the emergence of oil from well Songji-3 on September 26, 1959, and followed by tens of thousands of petroleum workers coming from all over China to engage in a “major petroleum battle” at the oilfield. The result was its development as a petroleum city from the wasteland as the oilfield was continuously explored.

Daqing City has emerged as a “Petroleum Capital” renowned for its petroleum, petrochemical, and high- and new-tech industries, and has been established as the most important center of economics, culture, education, healthcare and scientific research in western Heilongjiang Province.

In addition, Daqing is an ecological garden city with lakes, surrounded by green vegetation, and with a unique style thanks to its advantageous geography. This “100-lake City” stands on a wetland embraced by the Songhuajiang and Nenjiang rivers. With extensive green fields, dense lakes and swamps, and vast reed clumps, as well as the Longfeng Wetland Reserve, China’s largest city-based wetland is a beautiful tourist destination. Daqing demonstrates how people can live in harmony with nature.



Daqing City is located in western Heilongjiang Province in the central part of the Songhuajiang-Nenjiang Plain. About 2.9 million people live in its 22,161km² area that is home of the largest onshore oilfield and an important petrochemical base of China.

“Iron Man” Wang Jinxi

Wang Jinxi is an outstanding representative of China's petroleum workers. He was born in Yumen of China's Gansu Province and started his career as a drilling worker at Yumen Oilfield in 1949. In March 1960, Wang led his No. 1205 Drilling Crew from Yumen to participate in the “major petroleum battle” at Daqing Oilfield. Despite the harsh and extremely cold environment, he and his members transported and installed rigs by pulling and piggybacking, and supplied water in basins and buckets for spud-in. In fact, they finished the first oil well of the “battle” in only 5 days and 4 hours, a record at the time. To suppress a blowout from the second well they were drilling, Wang, with an injured leg, mixed mud with his body in a waist-deep mud pond. His energy to work day and night and capacity to fulfill even the most challenging task gained him the reputation of “Iron Man”.

The spirit of this “Iron Man” represents the mindset of Chinese petroleum workers. He said “If I can use my 20-year-lifetime in exchange for a large oilfield, I will.”, “Anyway, I believe and will prove that our country is not deficient in oil reserves”, “We must act, even though we have to create prerequisites for that”, “What we do should be what can pass the most stringent examination by our descendants”... These simple and heroic words have inspired generations of petroleum workers to commit to the hard work and contribute to the development of China's modern petroleum industry.







Jilin Oilfield

Jilin Oilfield is situated in Songyuan region of Jilin Province. Its exploration can be traced back to the geological reconnaissance that started in the province in 1955. On September 29, 1959, well Fu-27 produced an industrial oil flow in Fuyu County of the province. This led to the discovery of Fuyu Oilfield, the first oilfield with a reserve of more than 100 million tons in the province and one of the largest shallow oilfields in China. Two years later, in 1961, the development and construction of Jilin Oilfield started.

Jilin Oilfield includes 23 oil and gas fields such as Fuyu, Xinmin, and Yingtai that have been successively discovered. Within its area are several belts with a petroleum reserve of more than 100 million tons respectively. By the end of 2010, 1.42 billion tons of oil and 82.6 billion cubic meters of natural gas had already been proven, and it produced cumulatively 132 million tons of oil, with an annual output of 7.5 million tons of oil.







Songliao Basin



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