

Preface

The Amur River, or Heilongjian in Chinese, is the eighth longest river in the world. The watershed has an area of 2 million km² and covers the territories of Mongolia, Russia, China, and the Democratic People's Republic of Korea. In addition to its transboundary location, the Amur River Basin can be characterized by contrasts between other geographic aspects: Russia and Asia; boreal taiga and broadleaf temperate forests; continental and monsoon climates; northern and southern fauna and flora; and southern dense and northern sparse populations. The river basin was developed relatively recently and was subjected to severe political tensions throughout the nineteenth and twentieth centuries.

In 2002, we started the multidisciplinary Amur Okhotsk Project, relating the continental-scale terrestrial environment to the open-water ecosystem in the Sea of Okhotsk and western subarctic Pacific Ocean. After 8 years of multilateral effort, the project confirmed that primary production in the Sea of Okhotsk and Oyashio region depends on dissolved iron transported from the Amur River and its watershed. It is therefore reasonable to say that land use and land cover conditions in the Amur Basin are crucial for sustainable use of marine biological resources in the Sea of Okhotsk and Oyashio region.

This book features research on current and historical land use and land cover in the Amur Basin, which are important not only for basin residents but also for those affected by its material and water cycles. Land use and land cover are affected by natural and human interactions over long and short time periods. We therefore address historical and recent changes in a land cover analysis of the basin. "Amur Region of Russia: Natural Resources, Population, and Economy" is the first chapter and provides readers with background information regarding the Amur region. Chapter 2 is "Land Cover Change and Climate change Analysis of the Amur River Basin Using Remote Sensing Data", and Chap. 3 is "Wetland and Flooding in the Amur River Basin". These two chapters provide evidence of land cover change in the basin. "Changes in Wetland and Floodplain Sedimentation Processes in the Middle Reach of the Amur River Basin" is Chapter 4, which addresses the influences of land cover change on the fluvial environment from a geomorphology perspective. Land cover change, specifically the reduction of wetland, alters surface and underground water quality. Chapter 5 is "Water Chemistry of the Middle Amur

River”. Chapter 6 is “Droughts in North Eurasia and Climate Warming: Regional Changes and Consequences” and describes the wide variation of climate conditions in North Eurasia, including the Amur. “Geographical Information System for the Amur River Basin” is Chap. 7, which is a fundamental land use introduction to the Amur. Individual land use change processes related to state farms in north-east China have important effects on land use change in the Amur, and these are examined in Chap. 8, “Characteristics of Irrigation and Drainage Development on the Sanjiang Plain: A Case Study of State Farms”. A discussion of social factors of land use change is found in Chaps. 9 and 10, which deal with forest and timber. “Developments of Sino-Russo Timber Trade in the Amur River Basin, with Special Reference to the Transition Period During 1995–2005” is Chap. 9. “Development Process of Timber Harvesting in the Khabarovsk Region, Russian Federation” is Chap. 10. The 11th and final chapter is “Land Use Dynamics in the Amur River Basin in the Twentieth Century: Main Tendencies, Driving Forces, and Environmental Consequences”.

The Amur River Basin poses an essential question: How can we manage a trans-boundary watershed without disturbing terrestrial and marine ecosystems for future generations? We hope that this book can provide essential information for geographers about this relatively unknown region.

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