5 Waterways as Invasion Highways – Impact of Climate Change and Globalization

BELLA S. GALIL, STEFAN NEHRING, and VADIM PANOV

5.1 Introduction

The earliest civilizations flourished on the banks of navigable rivers. Indeed, their first monumental hydrological construction projects were concerned with irrigation and transport: around 2200 B.C., the first navigable canal, the Shatt-el-hai, linking the Tigris and Euphrates rivers in Mesopotamia, was excavated; in the 6th century B.C., a canal was built that joined the Nile with the northern Red Sea, and in the 4th century B.C., the Grand Canal in China connected Peking to Hangzhou, a distance of almost 1,000 km. The technological innovations of the 18th century led to an expansion of the network of navigable inland waterways, followed in the 19th century and the early part of the 20th century by the excavation of two interoceanic canals: the Suez Canal, which opened a direct route from the Mediterranean Sea to the Indo-Pacific Ocean, and the Panama Canal, which afforded passage between the Atlantic and the Eastern Pacific oceans.

Canals connecting rivers over watersheds or seas across narrow land bridges "dissolve" natural barriers to the dispersal of aquatic organisms, thereby furnishing these with many opportunities for natural dispersal as well as for shipping-mediated transport. The introduction of alien aquatic species has proven to be one of the most profound and damaging anthropogenic deeds – involving both ecological and economic costs. Globalization and climate change are projected to increase aquatic bioinvasions and reduce environmental resistance to invasion of thermophilic biota. Navigable waterways serving as major invasion corridors offer a unique opportunity to study the impact of these processes.

Ecological Studies, Vol. 193
W. Nentwig (Ed.)
Biological Invasions