Introduction

From Geographic Determinism to Political and Economic Factors

The Soviet empire stretched 8,000 kilometers from Europe to the Pacific Ocean and 5,000 kilometers from the Arctic Ocean south to the Asian continent of Persia, Iraq, Iran, Afghanistan, India, and China. The vegetation, climate, and natural resources of this vast nation had remarkable diversity. In some respects one could claim that this was the wealthiest nation in the world, if only it could manage its resources rationally. A taiga consisting largely of boreal forest contained roughly one-half of the world's forests. Its major rivers – the Don, Dnieper, and Volga west of the Ural Mountains, the Ob, Irtysh, Lena, Angara, and Amur in Siberia – have total annual flow that rival those of the other great rivers of the world. Reserves of oil, gas, and coal; of iron, magnesium, manganese; bauxite (aluminum), gold, and platinum, often located in the frigid Arctic or Siberia; and other ores and minerals are among the richest in the world.

Yet, both the tsarist and Soviet governments largely mismanaged these resources, developed them in a haphazard fashion that contributed to their waste and profligate use, and took insufficient measures either to prevent extensive pollution or to engage in remediation once they discovered the severity of pollution problems, in spite of the fact of a long tradition of what we would call today ecological thought among scholars in the empire. Scientists under the Romanov dynasty failed to convince government officials, businesspeople, and even their own colleagues to adopt modern scientific management techniques to protect resources and ensure their availability for present and future generations ("conservation"); Nicholas II, the last Romanov, was more consumed by other issues, including pressure to reform the government in the direction of a constitutional monarchy, a war against Japan, and World War I.

The Bolshevik government, by contrast, embraced scientists' contributions to identify and develop those resources. A number of projects to develop water resources, construct hydroelectric power stations, expand and protect arable land, and so on that had languished in the Tsarist era found an enthusiastic audience. At the same time, leading ecologists, zoologists, and other specialists, joined by writers and compilers of local lore, successfully pressed the government to establish a national network of nature preserves – called *zapovedniks* – that reflected at times contradictory views about whether it was possible to "manage" nature, if wilderness had inherent value, and even if it was possible to establish in any society a system of inviolable reserves as if untouched by human hands. By the time of Joseph Stalin's rule (1929–1953), the nation had adopted breakneck policies for economic and military development that put zapovedniks at great risk and accelerated resource use and misuse to such an extent that the peoples of the former Soviet Union will face significant problems of pollution and degradation for years to come.

This book is a response to the need for a comprehensive environmental history of the Soviet Union. No such work exists that covers the institutions, actors, and ideology behind the great Soviet experiment in modernity – and in the great achievements and failures of Soviet modernization programs in agriculture, industry, and nature transformation. Soviet leaders, specialists, and workers accomplished a great deal over the course of Soviet history. They set out, from the point of view of economy, society, and nature, to create something different, something revolutionary, something entirely modern in response to Tsarist economic mismanagement and what they believed was capitalist exploitation of the worker. In their nature transformation, industrial and agricultural programs they shared accomplishments with the capitalist nations. Although the Soviet experience has much in common with the rest of the world, the Soviet exaggeration of modernity tells us something important not only about Russian history, but about the relationship between nature and the West. In achieving these goals, we draw on the strengths of the authors' expertise in history, policy, economics, agricultural economics, geography, and literature.

It may indeed be that the industrial revolutions in capitalist Europe and North America and the socialist revolution in the Soviet Union share the features of profligate resource use and extensive pollution. They also share the important consideration that even when they are based on well-intended efforts to protect national security, promote public health, and improve the daily lives of citizens, they often have unanticipated

and extensive social and environmental costs. Paradoxically, the socialist nations promised to use and protect those resources in the name of the people to limit those costs of industrialization. Indeed, the environmental problems in socialist nations such as China, the former Soviet Union, and the allies of Soviet power in Eastern Europe were, overall, much more significant than in capitalist nations where the motivation to develop them came largely in the pursuit of profit motive. One reason may be that the people under socialism were largely silenced by their leaders from speaking openly and actively about environmentalism, whereas those in capitalist nations were able to engage in visible public campaigns to protect the environment owing to the expansion of civic culture throughout the twentieth century. However, over the course of Soviet history, the attitudes of leaders toward the environment and public involvement in environmental issues evolved significantly, actually permitting and encouraging public discussion in a number of spheres, and this involvement reveals a dynamism about environmentalism in Soviet society that is discussed in this book.

Still, the absence of a well-developed civic culture to promote full consideration of environmental issues in the former Soviet Union may be the major factor that led to such significant environmental degradation. Environmentalists (mostly biologists and writers) sought to protect a series of precious nature preserves from encroachment and quietly lobbied Communist Party and government officials to be aware of the economic potential of conservation and preservation. But they faced great odds in advancing any kind of "environmentalist" agenda, including in some periods the threat of arrest, loss of careers, and even execution.

The people of the Russian empire and the Soviet Union lived under absolute rulers for centuries, first the tsars and then the Soviet leaders from Lenin to Gorbachev. There were significant differences in the two regimes, of course, one being an autocracy, the other a communist authoritarian government. Yet, in more ways than one, continuity existed in conservation, preservation, resource management, and nature transformation movements of imperial Russia and the Soviet Union. First, the state owned the vast natural resources in both empires, although private ownership and individual initiative were crucially important to the economy during the tsarist era. Still, the state was a major engine of economic development and assiduously avoided measures to protect natural resources and limit air and water pollution with concern that these measures might interfere with development or were unnecessary. It poorly supported enforcement of laws, and sought insufficient penalties for lawbreakers.

Second, these were peasant societies, at least through the late 1950s, when Soviet leaders claimed that the nation had become urban with a working class whose size substantially exceeded that of the peasantry. At turns, leaders ignored the peasants, considered them incapable of a modern world view needed for industrialization, perhaps even viewed them as enemies of modernity – and opponents of efforts to improve on or tame nature; under Stalin they declared a war against them in the collectivization effort. Thus, a striking mismatch between the goals of the state and those of the citizen prevailed, no matter how government officials claimed best to understand those goals, express them for citizens, and define who the citizens were. This was the result, once again, of the weak development of civic culture, and few individuals had the mind set or training to question officials – had they been permitted to do so. Still, healthy scientific and technical debates often percolated on how to deal with various resource, pollution, and other problems.

Third, although having a strong scientific tradition, including in the life sciences and ecology, both the Tsarist and Soviet government adopted policies that left scientists often isolated from their colleagues in the West. This isolation grew pronounced in the Stalin era, even though this was a socialist regime whose leaders claimed to have embraced an internationalist scientific doctrine, Marxism, and whose policies contributed to the rapid expansion of the scientific enterprise. The political leadership in both systems mistrusted independent academic expertise and sought generally to control the intelligentsia. In spite of these controls and policies, the environmental sciences and environmental movements remained vital, and the activities of environmentalists, loosely defined, largely paralleled those of environmentalists in North America and Europe.

There is a danger of attributing to climate or geography overriding importance in explaining the environmental history of the former Soviet Union. Yet, the challenges of climate and geography (see section on "Physical Geography and Ecosystems of the Soviet Union") presented significant challenges to resource development, as did the great distances between those resources and population centers. The high costs of developing resources in Siberia, the Far North, and the Far East certainly – and unfortunately – encouraged practices with significant impacts on the environment. Both governments were plagued by the challenges of great spatial dispersion of people, resources, nature, and the need to develop infrastructure to master those distances.

Of course, there were significant differences between the two regimes. After the Russian Revolution, nascent ecological science expanded rapidly

during the social upheaval and political experimentation of the 1920s. Officials, scientists, and engineers worked out an ambitious national electrification program. They charted the construction of modern hydroelectric power stations. They embarked on an ambitious program to build on the few existing nature preserves to establish scores of them, many of which still exist. Yet, during the Stalin era, state-mandated programs for collectivization of agriculture, rapid industrialization, and autarky ensured that economic development was the sine qua non of decision making. Those who stood in the way of the programs – wittingly or unwittingly – were often labeled "wreckers." The "wreckers" included some of the nation's most able biologists, forestry and fisheries specialists, agronomists, and ecologists. Officials and ideologues came to consider nature itself an "enemy of the people" for refusing to buckle under to plans for rapid economic growth, and many of them believed that nature preserves were a waste of energy and resources. The emphasis was on heavy industry at the expense of the consumer, health, and housing sectors. Subsequent leaders adopted more rational policies toward the utilization of natural resources and introduced a number of environmental constraints on development, but were unable to change considerably the environmentally destructive momentum of the planned economy. Yet, the Stalinist legacy of mismanagement of resources, haphazard disposal of hazardous waste, and inadequate regulations persists into the twenty-first century.

A problem for ideologues, planners, specialists, and party officials in the Soviet Union was that for such spheres of human activity as nature conservation Marx, Engels, and Lenin had not enunciated clear positions, although clearly they saw the future world as one in which an industrial ethos prevailed.[1] In the absence of a classic Marxist position, self-appointed defenders of the proletariat, many of them of working-class origin, many of them with only rudimentary education yet considered "red specialists," condemned as "bourgeois" any traditional field, especially if they did not understand it. Of course, many others, perhaps most others, had moderate views of the human's place as a part of nature that resembled that in other countries of the world.

Whatever the continuity and change, the result, on the eve of the twenty-first century, was a new nation, the Russian Federation, still

[1] For an effort to find ecological thought in Marx, see John Bellamy Foster, "Marx's Ecology in Historical Perspective," http://pubs.socialistreviewindex.org.uk/isj96/foster.htm.

almost as wealthy as its predecessors in terms of natural resources, but with extensive environmental problems, and the Newly Independent States of the former Soviet Union with equally pressing problems. In this book – intended both as a survey and an original study – we explore the environmental history of the former Soviet Union. In each chapter we include discussion of major trends, actors, ideas, and institutions. Each chapter describes and evaluates change in the environment itself as a result of human action, and how changes in the environment had an impact on human activities.

Each chapter has a major narrative story, yet covers similar issues. We evaluate the significance of environmental issues from resource management to pollution abatement in a society in which the state was a major actor, where the economy was centrally planned, and where, because of the overriding centralization of bureaucracies and organizations, virtually all projects became costly, large-scale, resource-intensive projects. We consider the challenges in managing resources scientifically and in getting users to pay attention to regulations in these circumstances. We explore the nature of ecology as much as a social movement as a scientific field.

What Is Environmental History in This Book?

In this environmental history we tend to focus on economic and political factors more than may currently be the fashion in the field of environmental history. But as Douglas Weiner pointed out, environmental history is a big tent, an interdisciplinary approach to understanding human–nature interactions. These interactions clearly are not one-directional. Humans do not stand outside of or above nature to make rational, value-free judgments about how "nature" functions. In spite of a number of attempts that scientists and others pursued to see nature as an empirical object, it is best to understand it as a site of human and other interactions in all ecosystems, in cities and in the countryside, in forests and meadows, and in plowed land and seeming wilderness, and also to realize that political, economic, and other factors shape our attitudes toward nature and what we strive to make of it. We cannot deny the role of history in understanding ecology. Rather, as Weiner and others have argued, nature is a social construct, not some "real world" that exists independent of us.[2]

[2] Douglas R. Weiner, "A Death-Defying Attempt to Articulate a Coherent Definition of Environmental History," *Environmental History*, vol. 10, no. 3 (July 2005), pp. 404–420.

The reason for the focus on economic and political factors in an environmental history of the Soviet Union is simple: in the Soviet Union, state actors were the crucial individuals in shaping policies and behaviors and in apprehending what nature was. Political and ideological desiderata about what role nature should play in the construction of socialism, how people ought to react to the challenges of developing resources, and whether there were limits to human power all played out against the backdrop of the effort to create self-consciously a society that differed in so many respects from capitalist societies. Attitudes toward industry, agriculture, ecosystems, biodiversity, urban planning, and so on were shaped largely by political and economic concerns. Scientists of all fields, writers – whether representatives of official genres and approaches or not – and citizens understood "nature" both in regard to their personal relationships with nature and in regard to official attitudes about the Soviet polity and economy. Scientists who sought to temper industrialization, forestry, fishery, and agricultural programs for their potential risk to people and the environment, or who wished to prod the state to expand the designation of nature preserves, had to address political and economic concerns directly, or indirectly using careful language, even if they gave the appearance of writing about ecosystems as existing somehow divorced from broader social concerns. This is not to say that we ignore cultural and scientific components of environmental history that other specialists have stressed. Instead, when speaking about pollution problems, wilderness, "Virgin Lands," and so on, we argue that all of these issues and concepts were shaped to a great degree by political–economic concerns as well as by epistemological, ontological, and other concerns. Finally, we accept Weiner's argument that environmental history is precisely about power, about who "will control access to resources and amenities," what role experts played in determining the expected risks and benefits of one approach or another, and who actually made choices. Once one has made a choice about what is a fact and what is not, what constitutes the truth about nature and what does not, that person has made a deeply political choice because he or she excludes others from "the truth" if others do not accept that view.[3]

Perhaps to a greater extent in the Soviet Union than elsewhere, ruling elites designed and attempted to design entire landscapes in the name of science and progress – in the case of the Soviet Union, this would

[3] One of the most powerful enunciations of the view that epistemological choices are political ones is Donna Haraway, *Primate Visions* (New York: Routledge, 1989).

be an industrial landscape through and through – or, so we argue in this book. The prevailing view among officials in the Soviet Union about what constituted nature reflected a broad transformationist agenda to change nature for the better than it was under capitalism.

Large-Scale Projects and Large-Scale Bureaucracies

Another distinguishing feature of environmental history in the Soviet Union was the evolution of large-scale organizations concerned with studying nature, nature management, and nature transformation. The USSR relied heavily on centralized, large-scale projects and bureaucracies to force the pace of economic production, perhaps more so than in the United States with its Army Corps of Engineers, Bureau of Reclamation, Tennessee Valley Authority, or Bonneville Power Administration. These include military organizations and such massive economic ministries as the Ministry of Water Resources (Minvodkhoz), the Ministry of Electrification, the Ministry of Agriculture, and the Ministry of Middle Machine Building (the nuclear energy and weapons ministry) that commanded significant resources of manpower and capital and were allied unquestioningly with meeting state-mandated economic production targets to build dams, reclaim land, manage forests, produce food, and so on. The government also employed cheap, forced prison labor through the gulag system in such major geological engineering projects as the Baltic-White Sea Canal; the hydroelectric power stations on the Volga, Ob, and Angara Rivers; mining, road, and railroad; and forestry enterprises in the Far North and Siberia. We track the impact of these organizations and approaches across taiga and tundra, steppe and floodplains, forest and desert.

No ideas can rationally utilize – or "master," in the Soviet case – nature on their own. They require organizational and institutional actors. Thus, we consider the institutions – formal and informal – that molded and reflected environmental concerns: government, scientific, nongovernmental, regulatory, and so on. In the Soviet Union, institutions, especially those ministries and trusts connected with directing economic activities, were the key players. We explore how ecologists, planners, policy makers, and citizens worked through, with, and against these institutions.

Each chapter explores central ideas about the environment and ecology, how scientists, government officials, and citizens viewed those ideas, and the institutions and bureaucracies they created that had an impact on the environmental history of the Soviet Union. The starting point

for explaining environmental change is to understand the concepts, paradigms, and attitudes that guided Soviet society in its relationship to the environment; how they reflected cultural, political, and economic values; life; and how they are reflected in the practices of resource management, pollution, pollution abatement, and regulation; in scientific studies; and even in literary and artistic activity. As elsewhere, in the former Soviet Union, they were shaped by Enlightenment thought – that is, that humans can understand, control, and even improve on nature. But, as many historians have noted, a kind of geological or climatic determinism shaped the way Russians – from scientists and bureaucrats to peasants – viewed "nature." For them, it was vast, rich, yet unforgiving, something to be mastered, perhaps with science, and without a doubt by Bolshevik certainty. Under Soviet power, with fulfillment of the plan target the only judge of success or failure, resource use accelerated, worker safety was ignored, and pollution regulation and abatement were largely ignored.

Concepts as "biodiversity" and "ecosystem" are relatively recent ideas, largely of the second half of the twentieth century, although they existed in some form or another from the mid-nineteenth century. Hence we must be careful not to use a term that has recently acquired significance in a nineteenth or an early twentieth century context. Still, representatives of the Russian intelligentsia long ago advanced ideas about the interaction between humans and nature – of humans as part of nature, and not as a species above it – and understood that human activities would have a direct impact on other species and their habitats. The biogeochemist Vladimir Vernadsky developed the notion of the noosphere on the eve of the Russian Revolution according to which humans are a large-scale geophysical force who must understand human–nature interactions on the basis of study of the past to ensure the future. Vernadsky explored the human development of ferrous and nonferrous resources and countless artificial chemical combinations, geoengineering of rivers, seas, and oceans.

Another important theme in this book concerns state–society relations, and these comments refer not only to the case at hand, the Soviet Union, but to Germany, France, the United Kingdom – England, the United States, and other modern states. The modern state – government structures and bureaucracies and the officials representing the government and its official policies and ideology – has had an increasingly central role in environmental history in a variety of ways since the early eighteenth century, for example, when Peter the Great ordered surveys of Russian forests and issued proclamations to assign them solely to the tsar's use for the

navy and other military purposes. As a polity, a nation, and a sovereign political entity with a monopoly on power, the state can influence and direct activities that will shape the environment. Although generally seeing resources of fish, forest, furs, ore, and so on for their utility and direct benefit to state power and hesitating to establish rules to regulate their use or set aside lands for nature preserves or parks, officials have not been enemies of nature. They have understandably put military or economic programs ahead of nature protection in the name of national security and employment. But they have also worked with scientists, writers, and journalists and other individuals establish limits and prevent profligate use. They set aside forests; established seasons on hunting; regulated the use of waterways among competing interests; and eventually set aside national parks, wilderness areas, and other "objects" of human culture. The Soviet Union was no different in all of these ways.

By the mid-nineteenth century, governments around the world had chartered scientific societies and set aside funds for research and development activities, including the establishment of institutions that had direct and indirect relationships with environmental concerns. Hence, when we speak about the Soviet regime and its policies, we should recall that other states have pursued similar paths, encountered similar obstacles to rational resource management, and sought similar paths, policies, and laws to protect biodiversity. The relationship between the state and society – the bureaucrats and officials, the workers and peasants, the intelligentsia, merchants, businesspeople, and so on – must be seen therefore along a continuum: in some cases and in some periods, the state more actively engages in what we consider today to be environmentally sound practices, and at other times it supports practices that encourage profligate use of resources, damage ecosystems, and destroy biodiversity. We highlight here and there the ways in which the Soviet Union differed in its experiences, with brief reference to experiences in other settings. But the focus is the Soviet Union.

Similarly, the multifold relationship of the state to the environment as protector and exploiter exists in "society" as well. Private interests have long sought to develop resources toward the ends of profit, and have seen those resources as inexhaustible, pursued their exploitation rapidly to limit others' access to them, or perhaps simply misunderstood how plentiful they were, whereas, at the other end of a spectrum, naturalists and others have worried about what they perceive as the destruction of "pristine" nature, and in some societies have gained a reputation for standing in the way of "progress." Other members of society – indigenous