

## **Environmental Management in the Russian Federation: A Next Generation Enigma**

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## **Abstract**

Environmental managers in Russia face severe problems, both from Soviet-era and continuing environmental degradation and due to the weakness of current institutions with responsibilities for environmental protection. This paper draws on surveys, a case study of water pollution, and workshops on Russian environmental decisionmaking to explore prospects for environmental improvements. Using concepts from the regulatory reform literature on next-generation environmental policies, it focuses on the use of market incentives, the construction of a civil society, and community involvement, and emphasizes that Russian nongovernmental organizations may have a particularly important role to play in improving environmental management. Solidifying their legal base, coalition-building skills, and capability to conduct independent, pragmatic policy analyses would enhance their contribution.

**Key Words:** Russia, environmental management, non-governmental organizations, water quality, Siberia, transitioning countries, next-generation environmental policies

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# **Environmental Management in the Russian Federation: A Next Generation Enigma**

Kris Wernstedt\*

## **1. Introduction**

Environment protection in the Russian Federation embodies the enigmatic character that Winston Churchill ascribed to Russia in the late 1930s: it is a riddle, wrapped in a mystery, inside an enigma. The nation remains stunningly endowed with natural resources after the breakup of the former Soviet Union, possessing one-third of the world's known natural gas reserves, one-third of remaining old-growth forests, and 10% of renewable freshwater resources. It also has within its state agencies abundant technical expertise to manage and protect these resources, and a nongovernmental organization sector of scientifically sophisticated activists. Yet, in many geographic areas and economic sectors, environmental quality continues to deteriorate, resources fall short of demand, and resource productivity declines. Environmental policymaking appears fragmented and many of the institutions responsible for it are unstable. Some commentators have suggested that the country and its predecessor Soviet state have long been on the verge of an environmental breakdown (see, for example, Feshbach & Friendly, 1992). Despite widespread indigenous and international efforts to raise environmental performance, large-scale improvements in the management and quality of Russia's environment remain elusive.

My objectives in this paper are twofold. First, I seek to furnish a better understanding of the important institutional and media-specific difficulties that Russian environmental managers face at the local and national levels. Second, I aim to provide the reader with a more nuanced view of why many efforts to "fix" Russian environmental management are

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problematic. I argue that a de facto next-generation, Western model of environmental management and regulation advocated by many policy experts holds promise—a model that relies on market incentives, information provision, and community pressure—but it needs to be tempered with the well-known failures of Russian institutions and breakdowns in the rule of law. Russian nongovernmental organizations (NGOs) may have a particularly prominent role in the reconnection of the public interest in sustainable development to government priorities for environmental protection. This is consistent with the NGOs' heady influence as vehicles for citizen protest in the late 1980s during the final years of the Soviet era.

As a preview of the paper, the following section provides a broad-brush background on Russian environmental problems and the institutional apparatus that has evolved to address them. Subsequently, the paper delves more deeply into one example of these problems, namely pollution associated with oil and gas extraction in Siberian Russia and efforts to provide adequate drinking water and wastewater management in the face of this. This is followed by a short conceptual background on next-generation environmental policies in Europe and North America. The following three sections use the Siberian example, results from several surveys, and other evidence to explore several themes in next-generation policies—the use of market incentives, dependence on rule of law, and the role of information in community involvement—and their application to Russian environmental policymaking. The paper concludes with several suggestions for improving environmental management in Russia that are directed at nongovernmental organizations.

## 2. Background

The pernicious effects of Russia's resource misuse outside the country's borders—in such international bodies of water as the Sea of Japan and the Caspian, Baltic, North, and Black Seas, and on regional air quality—have long attracted considerable attention from its neighbors. In addition, the biotic and geopolitical importance of the country and the potentially destabilizing effects of poor environmental conditions make the state of the Russian environment a global concern. Several book-length treatments (Peterson, 1993; Pryde, 1995; Feshbach & Friendly, 1992) and popular media coverage of the environmental situation in Russia and other former republics of the Soviet Union have brought international scrutiny to Russian environmental problems. Moreover, since the initiation of *glasnost* in the

1980s and subsequent democratic reforms, nongovernmental organization (NGO) advocacy for environmental improvements, media coverage of the state of the environment, and official recognition of environmental problems—first in the Soviet Union and subsequently in its successor, the Russian Federation—also have raised the domestic visibility of these problems.

### ***Environmental Problems***

The range of environmental concerns in the Russian Federation is well documented by official sources (see, for example, State Committee of the Russian Federation on Environmental Protection, 1999). It includes sublimely technical problems related to nuclear contamination—including fallout from the Chernobyl nuclear reactor accident, the storage of waste from nearly 30 currently operating nuclear reactors, the dismantling of hundreds of nuclear reactors from decommissioned nuclear submarines, and the legacy of nuclear weapons production—as well as more mundane but equally devastating troubles of soil erosion, rapid land conversion, and air and water pollution. Through the 1990s, nearly 100 million Russian citizens in 200 large cities were estimated to be breathing air with pollution levels that exceeded Russian ambient air quality standards, and most of the country's river and lakes were classified as “moderately polluted” or “polluted.”

Although the high rate of environmental violations always has been driven in part by environmental standards that have been strict by world norms and thus particularly difficult to meet, data from the late 1990s indicate that more than 90 cities had annual concentrations of particulate matter and nitrogen dioxide that exceeded World Health Organization standards, and about one-half of Russia's population consumed drinking water that fails to meet some standards (Organisation for Economic Cooperation and Development, 1999). Heavy metals, hydrocarbons, and organic chemicals from industrial activity contaminated more than 2 million hectares of soil, and industrial activity in many cities probably contributed to a high rate of respiratory diseases and a high incidence of lead-related childhood mental development problems (Organisation for Economic Cooperation and Development, 1999). Nearly 60% of 3,300 Russians surveyed in the 2000 round of the

Russian Longitudinal Monitoring Survey (RLMS) reported that bad environmental conditions caused or contributed to chronic illnesses in their family (Mroz et al., 2001).<sup>1</sup>

The possible causes of the environmental difficulties in the former Soviet Union are well known and continue to be problematic. At the most elemental level, the structure of the economy in the Soviet era—both its emphasis on rapid heavy industrialization and militarization and its reliance on measures of physical output rather than value—was a primary driver of environmental degradation. Unless such degradation derailed the attainment of production quotas—and without the market price signals found in Western economies, this was unusual—it typically was underemphasized or ignored altogether.

Furthermore, there was no incentive to reinvest and upgrade capital stock and, consequently, modernization of the industrial sector lagged behind the West. Even at the close of the 1990s, the average age of industrial plants and equipment in Russia was three times that of its counterpart in Western countries belonging to the Organisation for Economic Co-Operation and Development, a problem that continues to hurt the country's economic competitiveness and contributes to poor environmental performance (Center for Strategic & International Studies, 2000).

The deliberate concentration of industrial enterprises during the Soviet era also generated extremely high levels of localized pollution. And unlike Western market democracies, which have had their own share of pollution and externalities to deal with, during most of the period, no strong constituency either inside or outside the government was allowed to gain enough influence to force enterprises to confront the pollution they were causing.<sup>2</sup>

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<sup>1</sup> Environmental-related illnesses have been discussed in the popular literature (e.g., Specter, 1995) as possible drivers for the decreases in the life expectancy of Russians over the last fifteen years. For males, these decreases have been dramatic, particularly in the early 1990s, when life expectancies dropped below 58 years. More recent studies, however, have discounted the importance of environmental drivers and attributed much of the fall in life expectancies to cardiovascular and alcohol-related illnesses (Walberg et al., 1998).

<sup>2</sup> The Soviet scientific community was an exception in that many scientists were able to organize in relatively self-run societies that had some notable environmental achievements. However, these were largely devoted to the protection of natural reserves, ostensibly for the purposes of scientific study, and their involvement in “dirtier” elements of environmental protection was muted (Weiner, 1999).

### ***Environmental Institutions***

Prior to the mid 1980s, responsibility for environmental protection in the Soviet Union was scattered in a number of ministries and agencies, with pollution abatement and control largely neglected in practice and most enterprises in noncompliance with environmental standards. This began to change with the onset of glasnost and perestroika in the mid 1980s as pressure to address environmental degradation increased (Organisation for Economic Cooperation and Development, 1999). The 1987 Law on State Enterprises decentralized some of the responsibility for environmental performance and instituted the principle of more rational use of and payment for natural resources, as well as ceded more environmental protection responsibilities to individual enterprises. In 1988, the formation of the Union Committee for Environmental Protection focused many of these responsibilities in one institution and gave higher visibility to environmental protection. The Union Committee's charge included the regulation and enforcement of environmental standards, management of "nature protection," and the coordination of environmental activities of the various ministries and agencies.

The Union Committee for Environmental Protection transitioned to the Russian Federation's State Committee for Environmental Protection (Goskomekologiya) in 1991. That same year, passage of the Russian Federation's Law on Environmental Protection established pollution charges countrywide and provided the legal basis for "environmental funds." These latter compose a three-tiered (federal, regional, local) set of extra-budgetary accounts for environmental activities, with more than three-quarters of the revenues for the environmental funds contributed by pollution charges (Organisation for Economic Cooperation and Development, 1998). The funds have the potential to be large revenue sources for environmental protection but actual payments into them have been modest due to inadequate tax collection and enforcement and local resistance to imposing high taxes on important industries. Often the funds have been raided to pay for nonenvironmental activities.

In 1993, Russian President Boris Yeltsin elevated Goskomekologiya to the more powerful Ministry of Environmental Protection and Natural Resources. This ministerial status persisted for only three years, however. Yeltsin reduced the environmental protection component of the ministry to a more subordinate State Committee for Environmental



Protection after his reelection in 1996—perhaps in response to the strong industry support he received in his campaign (Peterson & Bielke, 2001)—and in May 2000, President Vladimir Putin eliminated Goskomekologiya altogether and placed its responsibilities and personnel in the Federation’s Ministry of Natural Resources. Subsequent efforts to hold a citizen referendum on President Putin’s action garnered nearly 2.5 million signatures. However, Russia’s Central Election Commission rejected the attempt on the ground that less than the required 2 million signatures were legitimate.

Most experts believe that the transference of Goskomekologiya functions to the Ministry of Natural Resources downplays the importance of environmental protection and confirms a trend toward relaxed regulation and increased natural resource exploitation at the national level. Such resource development is seen as a critical component of the Federation’s economy and development. As Peterson and Bielke (2001) note, President Putin himself has argued that the Russian mineral resource complex can be the basis for the sustainable development of Russia and that natural resources more broadly provide abundant opportunities for large-scale investment. These opportunities were identified in a poll of some 100 economic experts that the William Davidson Institute at the University of Michigan conducted just prior to the 2000 Russian presidential election. More than 75% of the economic experts said the investment opportunities in natural resources were “good” or “excellent,” making it the highest rated of the seven possible investment areas that were identified.

The nosedive of the Russian economy throughout most of the 1990s—with real gross domestic capita falling by 40%, labor productivity declining, and income inequality and underemployment increasing—has further complicated environmental protection efforts by making it difficult to garner support for potentially costly environmental measures. It also has diminished the visibility and budget of environmental management agencies, which have had to rely increasingly on local funding as central budget allocations from Moscow have dropped sharply. Less than 0.3% of Russia’s federal budget went to the environment portfolio under the Yeltsin administration and, in 1999, federal budget allocations to the principle environmental protection agency in Russia were less than one-fourth of the amount requested (Research Analysts, 2000). Various authors (Wells & Williams, 1998; Ostergren,

2001) have suggested that government support for protected areas in Russia has declined in real terms by 60% to 90% since 1989.

Monitoring of environmental quality also has suffered from funding shortfalls. For example, although the size of the observational network for water quality was roughly the same in 2000 as at the end of the Soviet era 10 years earlier, the quality of the environmental data declined due to inadequate staff training, obsolete equipment, irregular maintenance, and poor data quality assurance procedures. Zhulidov (2000, p. 1936) notes that in 1998, fewer than 40% of the laboratories that analyze water quality chemistry were certified. Furthermore, the infrastructure of municipal drinking water and wastewater treatment facilities—which was funded predominantly by central budgets in the Soviet era—has deteriorated due to deferred maintenance and insufficient capital investment by local municipalities. These issues probably contributed to significant reported increases in gastroenteritis, hepatitis A, and bacterial dysentery in the 1990s (Peterson, 1993).

### **3. Oil and Gas Production in Western Siberia<sup>3</sup>**

The oil- and gas-rich areas of the western Siberia lowlands in the Tyumen oblast provide a useful microcosm of the situation confronting environmental managers across the Russian Federation. The sector as a whole is important to the national economy, providing more than one-fifth of government revenues and two-fifths of export earnings (Menshikov, 1999). Throughout the country, oil and gas enterprises have largely been privatized—the government share in major Russian oil companies is about 25%—but new capital investment in oil extraction and refining and labor and capital productivity are very low compared to other parts of the world (McKinsey Global Institute, 1998). Moreover, although gas production remained relatively constant through the 1990s, oil output dropped sharply after 1990 and, despite a sharp upswing following the ruble devaluation in the late 1990s, still has not fully recovered. Data from 2001 indicate, for example, that while oil production had

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<sup>3</sup> Information in this section comes from a 1996 study by a Russian-American team of engineers, physical and natural scientists, and planners of water quality in the Nizhnevartovsk area of the Tyumen oblast. Details of this study, which was sponsored by the respective Academy of Sciences in Russia and the United States, can be found in Woolard et al. (1996).

increased more than 20% from 1996, its low point in the post-Soviet era, it's still 30% below 1990 production levels (BP, 2001; Energy Information Administration, 2001).

The decades of energy extraction in western Siberia have clearly degraded environmental quality. Direct contamination of water bodies from spilled oil and brine along pipelines and at well sites is readily observable, native forest cover is heavily stressed, local air quality has deteriorated, and development at extraction sites, access roads, and towns has significantly altered the hydrology of the area. These changes have probably had some negative consequences for the public health of local residents and workers. For example, 74 percent of the region's 300 plus respondents to the RLMS perceive that chronic illnesses in their families are due at least in part to poor environmental conditions. This is the highest proportion of the eight Russian regions surveyed (Mroz et al., 2001).

Within western Siberia in the 130,000 square kilometer Nizhnevartovsk area along the Ob River in the Khanty Mansi autonomous region—a region that accounts for roughly one-half of Russian oil production—problems are particularly acute (see Figure 1). Production in Nizhnevartovsk's giant Samotlor oil field, for example, dropped from roughly 2 million barrels per day at the beginning of the 1990s to less than five hundred thousand barrels per day in 1996, and more than fifteen hundred oil wells in the region had been abandoned (Personal Communication, Nizhnevartovsk Environmental Committee, 1996). Ninety-two percent to 98% of the volume extracted from the field is water due in part to past efforts to reinject water to maximize the volume of recovered oil (Personal Communication, Nizhnevartovsk Environmental Committee, 1996; *The Economist*, 2001). This poses a daunting environmental problem: once the water is separated, it receives inadequate treatment and often is discharged to receiving surface waters.

The declining yields around Nizhnevartovsk mean local enterprises have limited funds to invest in technology upgrades and pipeline maintenance. While gas pipelines remain relatively reliable (since the system has largely been built since the 1970s) and the major oil trunklines run by a state-owned monopoly have improved their performance greatly since the large spills of the 1970s and 1980s, the field pipelines in Nizhnevartovsk and elsewhere that are owned by local producers are more troubling (Sagers, 2000). Roughly one quarter of Nizhnevartovsk's 11,000 kilometers of pipeline infrastructure need to be replaced every year, yet many local producers have insufficient revenues to fund this maintenance. In addition,

high capital costs and barriers to foreign investment arising from the uncertainty of production-sharing legislation, shareholder protection, and restrictions on imported physical capital limit the upgrading of production and transport facilities. As a result of chronic underinvestment, pipeline leaks that might make front-page news in other parts of the world occur regularly. For instance, during the two-year period from 1994 through 1995, the Nizhnevartovsk Environment Committee (NEC), a territorial committee formerly under Goskomekologiya, documented more than three thousand illegal spills and pipeline leaks in the region, which released nearly sixty thousand barrels of oil. NEC estimates of undocumented spills that are missed because of insufficient monitoring capabilities are ten-fold higher. Violations of effluent standards are rampant throughout the region, and NEC authorities estimate that only one-fifth of the water purifying systems needed to meet water quality requirements are in place and operational (Personal Communication, Nizhnevartovsk Environmental Committee, 1996).

The majority of urban residents in the region have access to treated drinking water, but budget constraints preclude testing for some potentially serious acute waterborne diseases such as *giardia lamblia* and *cryptosporidium*, and authorities do not have the capability to monitor either raw or treated water quality for volatile organics and disinfection by-products. In addition, demand for treated water outstrips supply. For example, in the city of Nizhnevartovsk—which houses about two-thirds of the region’s residents—estimated demand for treated water from the City’s direct filtration plant is more than 50% higher than available capacity. Conveyance losses are endemic, and many residents above the third floor of the typical 8- and 16-story high-rise apartment buildings have little or no service much of the day. On the wastewater front, the municipal treatment facility receives 50% more wastewater than it was designed to treat. The NEC is urging capacity expansion for both.

Many of the drinking water and wastewater problems in the region reflect rapid growth. Regional population exploded as part of the oil boom, with the population of the city of Nizhnevartovsk increasing from roughly sixteen thousand residents in 1970 to nearly 250,000 residents in the mid-1990s and stabilizing or dropping only slightly since then. Despite relatively high per capita incomes, the shift since 1991 to local funding of city services—necessitated by the drop in support from central budgets—has meant that funds for public infrastructure improvements are limited. User charges are typically far too low to

cover operation and maintenance costs, let alone capital improvements. As with many other urban areas of Russia, bottled or in-home filtered water is the water of choice for those who can afford it. Even with these precautions, rates of gastrointestinal illnesses are high.

#### **4. Incentives, Civil Society, and Information Provision**

Water pollution and the conditions that negate its resolution in the oil fields of western Siberia along with other environmental problems in the Russia Federation are relatively well known to environmental experts both inside and outside the Russian Federation. Over the last decade, western European and North American governments, foundations, and nongovernmental organizations have furnished more than one billion U.S. dollars of environmental assistance to state organizations and the nongovernmental sector to try to address these problems (Organisation for Economic Cooperation and Development, 1998; Powell, undated). Much of this assistance—which includes equipment, training, funds for the development of indigenous organizations and their operational support, and funds for western consultants—has drawn explicitly or implicitly on the “next-generation” model of environmental management, an approach that has gained great favor, particularly in the United States, since the mid 1990s (Chertow & Esty, 1997; Enterprise for the Environment, 1998; National Academy of Public Administration, 1997). This model rests more on flexible approaches than traditional command-and-control efforts, emphasizing incentives, the collection, analysis, and dissemination of information to guide performance-based efforts and encourage community pressure and involvement (Hausker, 1999).

The uniqueness of the Soviet-era and its aftermath means the application of the Western model of next generation environmental policies to Russia warrants some important qualifications. In particular, a critique of next-generation policies voiced by Steinzor (1998) and others in the U.S. context—namely the underemphasis on continued strong legislative, regulatory, and enforcement underpinnings to environmental management in a next-generation model—is especially relevant in Russia, where external funders and Russians both have noted the critical absence of a “civil society.” In broad terms, this concept refers to a web of self-organized, pluralistic independent institutions that can serve as a counterpoint to the traditional hegemony of the state. It includes a respect for and protection of individual rights and freedom, adherence to democratic values, participation in civic affairs, respect for

diversity and pluralism, and opportunities for empowerment. Most centrally, the Russian term for civil society, *grzhdanskoe obshchestvo*, assumes a “society based on a rule of law with limited government and sovereign citizens enjoying a comprehensive set of civil rights.” (Polischuk, 1997, p. 4).

Absent such grounding in civil society practice, pure next-generation environmental policies are likely to have only limited applicability to Russia. However, the next-generation model’s foundation of incentives, information provision, and empowerment of local communities—when coupled with an emphasis on the rule of law, legal reform, and enforcement—can help us examine the Russian environmental management system. Combining these perspectives and borrowing from my work in a U.S. domestic context (Wernstedt, 2001), we can look at the Russian environmental management system through three lenses.

- If economic incentives are to improve environmental performance in Russia, suitable conditions need to be in place for economic actors to perform as desired (Gustaffson 1998). These include the basics of a market economy, with competitive markets, trade in private goods, the minimization of externalities that distort markets, reliable institutions that can administer incentive systems, and no formal barriers to prevent the exit or entry of economic actors. The latter also requires low transaction costs and symmetric access to information by economic actors so they can participate in economic activities. In addition, practically speaking, incentives have to be set at a level that encourages economic actors to alter their behavior in order to achieve desired outcomes.
- Formal and informal institutions must be in place to advance environmental interests, most notably a legal framework that provides accountability and direction to environmental actors. This framework, at its core, depends on what has been called a culture of compliance (Bell, 2000), a set of values in which law has a social legitimacy and is respected as a compass to direct desirable social behavior. Such a culture is not an innate feature of any society, but rather is encouraged through example and by realistic expectations and a real prospect of enforcement. The latter threat must be credible, with penalties severe enough

to discourage undesirable environmental behavior and monitoring strong enough that the probability of detecting undesirable behavior is high.

- A key ingredient of community empowerment—particularly in the context of building a civil society—is a robust culture of information. This must include adequate and timely collection and maintenance of environmental information, as well as dissemination of this to community or civil actors. The information must be reliable and relevant, and institutions must be in place so that the community actors can use the information to participate in environmental deliberations (Tietenberg and Wheeler 1998). There must be opportunities to build broad-based coalitions of community, environmental, and economic actors that can fashion environmental agendas they find acceptable.

Drawing on various pieces of evidence—the Siberian example and the RLMS and William Davidson Institute data referenced earlier, a survey of Russian nongovernmental environmental organizations that I conducted, several joint U.S.-Russian workshops on environmental decisionmaking that I have participated in, and academic writings—I apply the above three constructs to examine Russian environmental management, highlighting both the basic elements of each construct and its relevance to Russia. Table 1 summarizes this discussion.

## **5. Market Mechanisms**

Russian policymakers and researchers have long shown great enthusiasm for using economic incentives to encourage better environmental performance. Peterson and Bielke (2001) note that fines, fees, and credits were features of environmental policy even during the Soviet reign, and Viktor Danilov-Danilyan, the long-term head of Goskomekologiya and an academic economist by training, heavily promoted these in the post-Soviet era. In addition, these mechanisms have garnered support from a wide array of groups. For example, in what was one of the most visible gatherings of the Russian environmental community in the 1990s—the second All-Russia Congress on Nature Protection held in 1999—attendees adopted the goal of setting higher prices for natural resources to reflect their true economic value as Russian’s main environmental policy. The group also supported widespread use of economic instruments to achieve this goal. Notwithstanding this keen interest in economic

incentives, it is clear that many of the necessary conditions for the successful use of market incentives to improve environmental performance are missing or, at best, incomplete.

### ***Market Institutions***

Despite a decade of reform, many of the prerequisites of competitive markets in Russia are poorly developed (Toman & Simpson, 1994; Stiglitz, 1999; Brezinski & Fritsch, 1997). The importance of the informal sector and the dominance of the state even in world-market driven, export-oriented sectors such as oil mean that many economic actors in Russia still do not face fully competitive market pressures. As an indicator of this continuing weakness, more than 70% of respondents to the October 2000 RLMS reported that they worked for an enterprise or organization that was owned or partially owned by the government (Mroz et al., 2001). This evinced a substantial decline since the early 1990s, but even so, 29% of personal income still came from such enterprises in 2000 and another 34% from state transfers such as pensions. Roughly 20% came from small-scale, labor-intensive household activities in the informal sector, and less than 10% came from fully private enterprises in the formal part of the economy. This does not mean that private enterprises are not significant contributors to the Russian economy—they are particularly in the services, retail trade, and information technology sectors—but it does highlight the fact that the extent of profit-maximizing economic behavior in the society is still much more limited than in Western economies. In such a setting, market incentives are likely to have a muted effect, at best.

Government environmental entities, such as the Nizhnevartovsk Environmental Committee, typically lack trained staff economists or financial experts and managers to design incentive programs. The tax, subsidy, and investment policies of economic and financial entities, such as the Finance Ministry, have far greater influence on the environment than do the policies of environmental entities, and the latter are further marginalized by recurring reorganizations, budget shortfalls, and competition with natural resource agencies (Peterson, 1997a). In most cases, regulatory compliance costs are not evaluated or considered by environmental agencies. In addition, the importance of costs as a criterion in environmental decisionmaking appears relatively low, at least from the perspective of environmental NGOs surveyed at the second All-Russia Congress on Nature Protection. As Table 2 shows, nearly three-quarters of NGO respondents to a question on important factors



in environmental protection placed costs in the lower tier of factors to consider when taking an action to protect the environment.

### ***The Virtual Economy***

The ability to continue to externalize significant environmental costs of production (such as spillage from oil pipeline leaks) and avoid accountability for such actions among even private enterprises means that many possible market incentives are ineffectual from the start. Moreover, the transaction costs of participating in incentive schemes that require investments in physical capital to promote production efficiencies can be extraordinarily high relative to the costs of networking with regulators and other stakeholders. The virtual economy theory advanced by Gaddy and Ickes (1998) asserts that many Russian enterprises operate at a considerable distance from a competitive market economy, in the sense that economic relations, even for private enterprises, are dominated by barter, negotiation over favorable tax treatment, unstable interenterprise contractual arrangements, tight social obligations to local communities, and other factors that are the antithesis of a well-functioning, competitive market economy. Responding to market incentives to protect the environment, or even investing in physical capital to promote maximum production efficiency and profit, may be far from optimal behavior. Rather, enterprises invest in relational capital—goodwill with local, regional, and federal authorities—by providing services, bribes, or other favors that later can be used to secure favorable treatment.

Although the oil industry is far more export-oriented than most Russian economic sectors, it, too, faces clear incentives to nourish the local relationships that are the hallmark of a virtual economy. Even Russian oil companies that are large by world standards and used their cash-rich position to increase investment sharply after 1999 (Tavernise, 2001) are not fully exposed to market forces. For example, the chief executive of TNK, one of Russia's major oil companies, felt compelled to relocate from the company's Moscow headquarters to the company's main fields at Samotlor near Nizhnevartovsk to oversee faltering reforms that were intended to break out of Soviet-era management habits (The Economist, 2001). These habits included reluctance among senior managers to share information within the company and a lack of commitment to cost control and conservation, traits alien to a market economy but endemic to a virtual one.

### ***Insufficiency of Incentives***

Even when economic incentive schemes are put in place, the incentives may be too low to alter behavior. For instance, the Nizhnevartovsk Environmental Committee issued 80 fines for nearly \$2.5 million to polluting enterprises in 1995—the latest year for which figures are available—with much of this directed at the oil pipeline spills. Many of these fines were never collected, but even if they had been, their low-level cost relative to mitigation costs meant their revenue raising properties always would significantly outweigh the incentive effects for changing behavior and enhancing environmental quality. This is a pervasive problem in Russia, one that bedevils both the use of incentives and the threat of enforcement in many environmental media. For example, Golub and Gurvich (1994) have suggested that, across Russia, air emission charges would have to increase thirty-fold to have any behavioral effects beyond those already provided by often unevenly applied command-and-control regulations.

A further barrier to greater use of incentive-based approaches is that significant behavioral changes could lead to industry slowdowns, threatening both the funding of environmental authorities and the livelihood of residents dependent on the sector against which enforcement actions are being taken. In Nefteyugansk, for example, an oil town of about 100,000 people in Khanti Mansii, 30% to 40% of local residents would lose their means of financial support with industry restructuring, perhaps one third of these directly as a result of layoffs (McKinsey Global Institute, 1998). Many of these residents have little ability to move out of the region, due in part to continuing de facto residency permit requirements in parts of the country and the absence of developed housing and labor markets. In addition, low incomes make migration to other areas and sectors prohibitively expensive for many workers.<sup>4</sup> Local governments, who fear calamitous drops in tax revenues and enterprise-provided social services, also can resist proposed market reforms and layoffs by threatening the revocation of oil licenses.

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<sup>4</sup> Despite an increase in average Russian household income over the last two years, average income levels adjusted for inflation remain 30% below 1992 levels (Mroz et al., 2001).

## 6. Rule of Law and Civil Society

It is well recognized that a civil society and the rule of law and its effective enforcement are weak in present-day Russia. Results from the William Davidson Institute's survey of economic experts just prior to the 2000 Russian presidential elections suggest the primacy of building a civil society and legal system of protection. Nearly 60% of all survey respondents ranked "establishing a rule of law" as the most important area that the newly elected Russian leader should focus on (from a list of 13 choices), while more than 85% identified it as one of the three most important areas. More than three quarters of the experts within Russia and Central and Eastern Europe ranked the state of the civil and legal systems as the primary problem and all identified it as one of the two most important areas. More specific to environmental policies, Table 3 shows that two thirds of the environmental NGOs surveyed at the second All-Russia Congress on Nature Protection identified improving legislation as one of the top priorities in the mission to improve environmental policies. Unfortunately, the zeal for legal and regulatory reform runs into several fundamental structural problems in Russian society that can sabotage such efforts.

### *Implementation and Enforcement Issues*

Despite abundant interest in the rule of law and the primacy of legal requirements—as Table 2 shows, nearly 90% of NGO respondents identified legal requirements as one of the most important factors to consider in environmental decisionmaking—the more pragmatic aspects of a law-based civil society to promote environmental protection may receive only passing attention in Russia. For example, the Russian environmental NGO community appears to put a relatively low priority on the implementation or enforcement sides of environmental actions, a view at odds with the priority placed on improving legislation. Table 2 shows that fewer than one-quarter of NGO respondents put implementability in the top three factors to consider when taking an action to protect the environment, while Table 3 indicates that only about one-third of respondents identified enforcement as a top priority for improving environmental policy. Bell (2000), among others, has written of the "aspirational" nature of much lawmaking in Russia, referring to laws that are written for their "exhortatory" value with little expectation they ever will be enforced.

As an adjunct to implementation shortfalls, the capacity for effective enforcement of laws is limited, thus expectations for compliance are often unrealistic. This in part reflects the problem identified earlier, namely that the principle enforcement threats and drivers of compliance—fines and penalties for violating pollution standards—are relatively low. They need to provide critical revenue to employ cash-starved environmental committees, and thus cannot be too high so as to change enterprise behavior and starve the committees. In addition, the common practice of recycling some of the revenues from the fines back to enterprises to mitigate damage means that the net cost of these to enterprises are often quite low, thus further dampening the incentive for compliance.

### **Monitoring**

Environmental monitoring, a staple of enforcement, is difficult in Russia because the vastness of the territory can make it prohibitively expensive. Across Russia as a whole, each station in the water quality monitoring network covers an area greater than 9,000 square kilometers on average, with stations in the more isolated parts of central and eastern Russia covering areas more than 250,000 square kilometers. To complicate matters, monitoring traditionally is not set up to meet effluent standards. The vast and sophisticated network of the national hydrometeorological and environmental monitoring system (*Roshydromet*), for example, focuses on surface ambient conditions and long-term forecasts of environmental conditions, rather than on effluent quality (Zhulidov et al., 2000). This allows the monitoring of environmental outcomes but is poorly suited for determining where site-specific discharge violations are occurring.

In addition, the direct relevance of the monitoring for public health typically is low. For example, human health considerations have appeared only indirectly as concerns of the Nizhnevartovsk Environmental Committee, a feature that reflects the fact that drinking water and water quality have been in the jurisdiction of agencies other than Goskomekologiya. In general, monitoring around the country aims at identifying overall contamination of the environment rather than at quantifying actual human exposure or directly informing near-time environmental management operational decisions (Thomas & Orlova, 2001; Revich & Demin, 1994; Zhulidov et al., 2000).

### **Corruption**

Finally, the pervasiveness of corruption in Russia cannot be overemphasized. In 2001, Transparency International—an international nongovernmental organization that monitors government accountability and corruption—ranked only 10 countries lower than Russia in terms of corruption, drawing on corruption surveys of 91 countries that have been conducted by different organizations. In the Russian virtual economy described previously, enterprises act rationally when they invest in personal and extra-legal “relational capital” with government bureaucracies and individuals rather than adhere to formal legal and regulatory prescriptions. This can take the form of petty infractions—bribes to relatively low-level officials to ignore environmental violations, for example—or activities at higher-levels that may have a long-lasting effect on the economy, as occurred during privatization in the 1990s.

## **7. Information Provision and Community Participation**

Information provision in principle has been an important part of the official Russian environmental apparatus, and citizen access to information is a right provided by the Constitution of the Russian Federation. In addition, the 1991 Law on Environmental Protection and the 1995 Law on Specially Protected Natural Areas provides citizens the right to request information regarding pollution as well as legal standing to assist state agencies in providing environmental protection. The 1995 Russian Federation Information Act provides state agencies a legal way to collect information and publicize it (Harman-Stokes, 1995; Ostergren, 2001).

In practice, however, access to government data has long been problematic in Russia, even for technical specialists working in government agencies. This is due to classification of data based on security concerns as well as bureaucratic turf battles. More recently, 1997 regulations that allow Roshydromet to sell information to nonfederal users—a policy that also has been applied to federal users—has imposed costs that effectively make the data unavailable (Zhulidov et al., 2000). In addition, decisionmaking in Russia has historically been viewed as hierarchical and top-down (Schechter, 1998; Wedel, 1998). This complicates efforts to provide information and encourage community involvement in several ways.

### ***Public Involvement and the Role of Experts***

Examinations by Russian and Western organizations and individuals involved in international collaboration have identified the vital role for the public to participate in environmental management in Russia (London Initiative on the Russian Environment, 1998). Yet, reliance on technical solutions and the exclusion of nonexperts from decisionmaking is a cultural tradition and pervasive practice in Soviet and Russian environmental decisionmaking (Bell, 2001; Weiner, 1999). To some extent, environmental NGOs are fighting this tradition. Table 4 shows, for example, the importance to many NGOs of public educational activities and information dissemination through the media. Iakimet's (1999) study of more than 150 Russian environmental NGOs reveals similar patterns, characterizing NGO principal activities as collecting and disseminating ecological information and ecological education (assistance to local populations also appears as an important focus in contrast to the NGO survey). However, both surveys indicate that direct action through education of local officials, lobbying, and environmental rehabilitation is very limited. This in large part reflects the fact that most NGOs lack a point-of-entry to decisionmaking, particularly at the regional level (Yanitsky 1999, cited in Tysiachniouk & Karpov, 1998). It also derives from the composition of environmental NGOs, many of which are made up of predominantly scientific and technical experts.

Such expertise constitutes one of the traditional strengths of the Russian environmental NGO sector, but it comes at a cost. Tysiachniouk and Karpov (1998) argue that many NGO representatives "insist on the necessity for 'professionalism' and 'scientific approval' in decision-making," and place a low or negligible value on experiential evidence contributed by local citizens. Thus, the connection between NGOs and the communities in which they work is frequently weak, a systemic problem that is a symptom of the paucity of crosscutting ties to reinforce Russia's weak civil society (Peterson, 1997b). The bias toward scientifically credible solutions can diminish opportunities for public involvement, because the bias devalues compromise and interest group negotiation. In addition, the scientific and technical base has meant that interest and expertise in policy analysis among NGO activists typically has been limited. Looking back at Table 2, this perspective is well represented. More than two-thirds of the environmental NGO respondents believe that an action's scientific justification is one of the most important factors to consider when taking an action, a ranking

exceeded only by the high importance placed on legal requirements. The view of the local public lags behind this by 25 percentage points, and the views of local industry and local government appear to be even less-important considerations.

The focus on technical solutions and exclusion of nonexpert views bedevils environmental performance. In the Nizhnevartovsk area, for example, the most sought after contribution from an expert international team studying local water quality problems was for the team to publicly support the NEC's proposals for infrastructure improvements, despite the apparent lack of broad public support and funds for the improvements. Apparently developed independent of local preferences, capacity expansion was identified in a circular fashion. A closed group of experts simultaneously defined it as the principal problem that needed to be addressed and chose it as the solution to the problem. There appeared to be little or no effort at public outreach to help with problem formulation, and no mechanisms to include community input in decisionmaking. Softer, nonengineered solutions to the water problems—such as demand-side management through pricing to ease treatment burdens—were not vetted and had no advocate, even though evidence from Central and Eastern Europe and the Baltic countries suggests that pricing can reduce treatment needs considerably (Peterson, 2000a). In sum, the technical focus defined the goal as increasing the delivery volume of treated drinking water and wastewater, rather than providing quality service to the public while maintaining productivity and profitability to the drinking water and wastewater treatment providers.

### ***Coalition Building***

In a review of foreign environmental assistance efforts, Powell (undated) has identified relationship building among NGOs, the state sector, enterprises, the media, and the public as critical influences on the development of a civil society and environmental progress. Such coalitions are particularly essential in Russia due to the nascent rule of law and weakness of the state vis-à-vis industrial and commercial interests, limited channels for societal input into governmental decisionmaking, and the tight connection between environmental problems and economic issues referenced at the outset. In such a setting, personal connections and a form of the relational capital described by Gaddy and Ickes (1998) are essential elements. Moreover, the coalitions need not depend on altruistic motives for stakeholder participation,

but rather can draw on material self-interest. Indeed, effective coalitions for environmental progress may not even include environmental NGOs. For example, recent efforts to phase-out leaded gasoline in some regions of Russia have been successful largely because regional governments and refining enterprises collaborated to create a competitive monopolistic advantage undergirded by regional bans on leaded gasoline (Thomas & Orlova, 2001).

The evidence presented in Table 5 suggests that coalition building and working with a diverse group of stakeholders can be a challenging task for many environmental NGOs. While the two leftmost columns indicate that a relatively high percentage of NGO respondents “always” or “usually” work with the listed groups—led by the 92% of respondents who “always” or “usually” work with scientists—more than 40% of the respondents indicated they only “occasionally” or “seldom or never” work with local government officials, agencies, and the local public. Most tellingly, 92% of NGO respondents only “occasionally” or “seldom or never” work with industry.

### ***View from a Workshop on Environmental Decisionmaking***

The exclusion of important stakeholders and reliance on experts as opposed to local, coalition-based solutions in NGO activities is further highlighted by a set of joint American-Russian workshops on environmental decisionmaking. These consisted of two environmental prioritization exercises in 1997 and 1998 and one public participation workshop in 1999. The latter in particular explored interest group involvement in setting environmental requirements, using an example from the United States and examining the applicability of this to Russia (see Bell, 2001 for a description of this workshop). Despite much pre-workshop consultation between the Russian and American organizers, most of the Russian delegation—which was led by the Center for Russian Environmental Policy, arguably the most influential national NGO environmental policy group in Russia—seemed much less interested in the process of public participation and the negotiation of goals and approaches for achieving these than in identifying new technical means to achieve exogenously-determined environmental goals.

This focus derives in part from the legacy of the autonomy of decisionmaking entities and their insulation from broader public input. In fact, the Russian delegation itself appeared dubious that citizens or nonexperts could play a legitimate role in policy formulation. This



disbelief likely reflected their experience that citizens historically have not had substantive access to decisionmakers, but it also rested on an apparent disdain for the contribution of nonexperts to policy solutions. Only one NGO representative from the Russian delegation, who also was a member from a local city council, seemed to view citizen participation favorably, drawing on her own efforts to link citizens, government officials, and industry to address environmental problems. In general, as observed by one American participant in the workshop, the Russian delegation believed that attracting money and other resources for technical solutions was more critical to addressing environmental problems than attracting widespread support from nonexperts.

## **8. Conclusions and Opportunities for the Future**

In light of the litany of difficulties with market incentives, the rule of law, and reliance on community pressure in the Russian environmental context, it is no mystery that Russian environmental management often appears riddled with contradictions. Basic market and legal institutions that lie at the core of any effective environmental management system historically have been weak, and sociocultural traditions, such as the open sharing of information among an array of expert and nonexpert stakeholders, and the civil society found in many other countries are thin. The well-developed human capital of the Russian scientific and technical establishment cannot surmount these obstacles alone. Given the legacy of heavy industrialization over the last 75 years, a contracting economy and population over the last 10 years, and pervasive corruption, aspirations for quick improvements in environmental management are not likely to be realized.

This is not to say that no such improvements have emerged. Notwithstanding the above comments, more people from different walks of life now participate in what are often more inclusive environmental decision forums in Russia. The public participation workshop described above included government representatives, elected officials, scientists, and business people. More open and substantive exchange of ideas took place in the workshop than would have been the case 10 years earlier, and the hunger of the Russian delegation for implementable ideas was a step forward from the aspirational past. This was not without its own problems—the desire for cookbook approaches ignored the all-important institutional context critical for workable ideas—but it evinced an attitudinal shift from ideological

positions toward pragmatic approaches to moving forward. In addition, an array of thousands of indigenous Russian environmental NGOs have worked on the ground in Russia with some notable successes at the local level, despite continuing harassment with inspections, unfavorable tax treatment, and other hurdles placed by governing authorities. According to the evidence collected in the NGO survey, public education has been one of the most effective activities for improving environmental policies and promoting it is one of the highest priorities.

What, then, are the most promising prospects for improving environmental management and policy in Russia? Unfortunately, there are no silver bullets or ready answers to this question. Clearly, as numerous commentators have argued, fundamental improvements in Russian environmental management require fundamental reshaping of Russian institutions. This includes establishing more competitive real-market relations rather than virtual economic ones, establishing a rule of law, decreasing corruption significantly, implementing a tax code that is transparent and does not penalize environmental compliance, and attracting foreign direct investments that provide management and technological improvements rather than what is often perceived to be second-rate technology and lower levels of environmental protection. It also likely requires instilling in businesses and individuals a sense of environmentally responsible behavior. This is a difficult tightrope act when enterprises face market pressures to shed themselves of the historical social responsibilities they have had to local communities, and citizens search for meaningful ways to be civically engaged in the face of day-to-day economic pressures.

Short of seismic institutional shifts, a number of less ambitious efforts could improve environmental performance. Here I will focus on those related primarily to environmental NGOs. Since the demise of Goskomekologiya in 2000, the visibility of these NGOs and their cooperation with each other has improved markedly. I would argue that modest improvements could be made on at least three fronts.

### ***Legal Status of NGOs***

Placing NGOs on solid legal and tax footing within the Russian Federation of laws and codes is a long-sought goal, the attainment of which would enhance the stability of NGOs. This would both allow them to monitor the responsible behavior of environmental players

and lower their vulnerability to harassment from the state. At present, the tax policies toward NGOs (as with all nonstate entities) are vague and uncertain, lack clearly outlined legal grounds, and are ad hoc (Polischuk, 1997). However, prospects for improving the legal status of NGOs are mixed. On the one hand, President Putin has publicly expressed support for the NGO movement, welcoming its growth and calling for a continuing constructive dialogue with the government (Goble, 2001c). On the other hand, commentators have speculated that much of the rhetoric about supporting NGOs and a civil society is camouflage for an NGO sector that is largely government driven (Goble, 2001a); harassment of NGOs continues and, in some cases, has intensified (Peterson, 2000b). How this will play out over the next several years is a matter of internal Russian politics. However, international pressure, coupled with Russia's desire to join or become a full fledged member of international organizations such as the World Trade Organization and G-8, provide incentives for legal and fiscal reform that strengthens the legitimacy and stability of NGOs.

### ***Building Coalitions for Local Support***

Much of the success of the Russian environmental NGO movement has rested on grassroots effort that have flourished in part because they operate under the radar of national and regional authorities. To be sure, the local, grassroots character of an NGO does not appear to be an important predictor of whether the NGO will be successful (Powell, undated). In fact, with tight finances and often narrow dependence on a charismatic leader, grassroots organizations are particularly vulnerable to dissolution or takeover by local economic and political powers. However, unlike the scientific societies during most of the Soviet era—whose “mass support” was largely restricted to teachers, students, and nonparticipating employees of the ministries and factories recruited to support the societies (Weiner, 1999)—many of the most effective environmental NGOs in the post-Soviet era have established legitimacy and found some success by drawing on local, grassroots support. They have campaigned for local referenda, organized protests, and promoted healthier local environments, yet avoided visibility and threats to powerful national or regional interests. Local or regional groups may be more relevant to the daily environmental life of many

Russian citizens than distant NGO or governmental actors—even given a strong historical orientation toward the center—because of the collapse of many central institutions.<sup>5</sup>

According to a 2001 poll by the Public Opinion Foundation, only 5% of Russians participate in public organizations and nearly 75% say they have no interest in doing so (Goble, 2001b). This may reflect a historic distrust of institutional agendas for change. Regardless, broadening the base of civic engagement through active outreach and accompanying public relations on issues elemental to many Russians and people elsewhere—land, public health, economic livelihoods, and local community protection—would help to establish a broader political legitimacy. Coalition building is critical in this regard. Partnering with local enterprises—both to work on pollution control efforts and as a possible partner or donor to local community foundations—and joining with local citizens, religious groups, elected officials, and government bureaucrats, is essential in an environment where relational capital is a key driver of decisions and where courts of law lack the independence or standing to guarantee basic protections. As such, long-term assistance to improve outreach, public relations, and coalition building skills may yield high payoffs.

### ***A Role for Grounded Policy Analysis***

Finally, there is a need for more independent and rigorous assessment of policies affecting Russian environmental planning and management. Most importantly, these assessments must be grounded in the realities of Russian institutional failures and individual, enterprise, and government behavior. Independent policy analysis is in its formative years in Russia, a condition that reflects both limited resources and the state and direction of social science in the Soviet era. Recently, organizations conducting independent policy analysis have emerged in Russia, some focusing primarily on environmental policy and others on analytically sophisticated techniques in the western tradition.<sup>6</sup>

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<sup>5</sup> A survey of more than 3,000 residents in Siberian cities shortly after Putin eliminated Goskomekologiya indicated that more than 80% of respondents believed it was essential for Russia to have an independent committee for protecting the environment. However, more than 60% of respondents did not know that the State Committee had been abolished (Kutepova, 2001).

<sup>6</sup> In addition to the Center for Russian Environmental Policy see, for example, the Center for Economic and Financial Research at <http://www.cefir.ru>.

The unstable nature of Russian environmental institutions makes the straightforward application of policy analysis—always a dicey proposition even in the most receptive institutional environment—an extreme long shot. A potentially more fruitful model warrants consideration: a mixed approach where a coalition of policy analysts, representatives of enterprises and government officials, and other stakeholders operate on a scale where problems are realistically susceptible to intervention. This model, while still drawing on the respect afforded to experts and their scientific and technical expertise, could enlarge the locus of decisionmaking to include an array of stakeholders. Such an approach could push Russian environmental policy and management decisions in a more desirable and less enigmatic direction that advances both Russia's and the world's self interest.

TABLE 1. Concepts and Experiences in Russian Environmental Management.

Element	Description
<b>Market Mechanisms</b>	
Private Markets	<i>Concept:</i> private market dominates relations among economic actors <i>Experience:</i> state and combined state/private enterprises are principal sources of income to economic actors
Competitive Relations	<i>Concept:</i> economic actors act rationally to maximize profits <i>Experience:</i> virtual economy dominates in many sectors, and economic actors invest in relational capital
Institutions	<i>Concept:</i> state institutions sufficiently established to administer incentives to economic actors <i>Experience:</i> not enough expertise in environmental agencies to do economic analysis, costs of actions seen by many as low concern, environmental agencies less influential than finance and economic agencies
Incentives	<i>Concept:</i> incentive systems sufficient to alter behavior of economic actors <i>Experience:</i> fines and fees set too low to alter behavior, environmental agencies depend on fines/fees as revenue source, environmental agencies face pressure to avoid actions that might threaten local livelihoods
<b>Civil Society</b>	
Deterrence	<i>Concept:</i> legal penalties sufficiently harsh to deter negative behavior by environmental actors <i>Experience:</i> implementation of laws and regulations not a high priority, poor record of enforcement and collection of fees and fines, recycling of fines and fees to environmental actors softens the impact
Credibility	<i>Concept:</i> threats posed to environmental actors by penalties are credible <i>Experience:</i> widespread corruption in enforcement of regulation, laws are “aspirational” and not expected to be met
Monitoring	<i>Concept:</i> capability to monitor actions of environmental actors is well established <i>Experience:</i> vast area to monitor with limited funds, focus on ambient conditions rather than discharges
<b>Information and Community Involvement</b>	
Collection	<i>Concept:</i> relevant information for community actors is collected in a timely fashion <i>Experience:</i> access restricted for many users, costs of information are prohibitive
Public Involvement	<i>Concept:</i> opportunities for community actors to use information to participate in decisionmaking <i>Experience:</i> tradition of top-down, hierarchical decisionmaking, reliance on scientific and technical experts
Coalitions	<i>Concept:</i> ability to build coalitions of community, economic, and environmental actors to advance mutual agendas <i>Experience:</i> history of weak coalition building, limited experience among NGOs in working with broad coalitions that include local governments and industry

**Table 2: What do you believe should be the most important factors to consider when taking an action to protect a natural resource or to control pollution? Rank from 1 to 9, with 1 indicating the most important factor?\***

	top 3 <sup>rd</sup> *	middle 3 <sup>rd</sup> *	bottom 3 <sup>rd</sup> *
legal requirements	89	7	4
views of local government	19	33	48
views of local public	43	39	18
views of local industry	4	41	56
cost of action	4	25	71
scientific justification	68	18	14
implementability	24	52	24
fairness to other groups	4	52	43
reduction of risk	38	46	15

\*The three rightmost columns refer to rank terciles. For example, the leftmost of the three columns (headed by “top 3<sup>rd</sup>”) represents the percentage of respondents who ranked the factor in the top one-third of factors, while the rightmost of the three columns (headed by “bottom 3<sup>rd</sup>”) represent the percentage of respondents who ranked the factor in the bottom one-third of factors. Row totals may not add to 100, due to rounding.

\*\*Survey respondents are NGO attendees at the 2<sup>nd</sup> All Russia Congress on Nature Protection held in Saratov, Russia in June 1999

**Table 3: What are your priorities for improving environmental policies? Rank from 1 to 8, with 1 indicating the area that needs the most attention.\*\***

	top 3 <sup>rd</sup> *	middle 3 <sup>rd</sup> *	bottom 3 <sup>rd</sup> *
improved legislation	66	14	21
improved enforcement	34	55	10
increased penalties	24	28	48
increased public involvement	41	55	3
higher funding	7	54	39
increased use of market incentives	34	34	31
increased use of science	22	41	37
increased education	52	38	10

\*The three rightmost columns refer to rank terciles. For example, the leftmost of the three columns (headed by “top 3<sup>rd</sup>”) represents the percentage of respondents who ranked the factor in the top one-third of priorities, while the rightmost of the three columns (headed by “bottom 3<sup>rd</sup>”) represent the percentage of respondents who ranked the factor in the bottom one-third of priorities. Row totals may not add to 100 due to rounding.

\*\*Survey respondents are NGO attendees at the 2<sup>nd</sup> All Russia Congress on Nature Protection held in Saratov, Russia in June 1999



Table 4: In what activities has your NGO been the most effective? Rank from 1 to 10, with 1 indicating the most effective activity.\*\*

	top 3 <sup>rd</sup> *	middle 3 <sup>rd</sup> *	bottom 3 <sup>rd</sup> *
public education	44	48	8
protection of natural areas	40	24	36
improved scientific decision base	44	32	24
assistance of local populations	9	35	57
environmental legislation	13	48	39
environmental research	40	20	40
environmental rehabilitation	0	19	81
media coverage of environment	52	24	24
environmental monitoring	13	39	48
education of officials	17	21	63

\*The three rightmost columns refer to rank terciles. For example, the leftmost of the three columns (headed by “top 3<sup>rd</sup>”) represents the percentage of respondents who ranked the activity in the top one-third of effective activities, while the rightmost of the three columns (headed by “bottom 3<sup>rd</sup>”) represents the percentage of respondents who ranked the activity in the bottom one-third of effective activities. Row totals may not add to 100 due to rounding.

\*\*Survey respondents are NGO attendees at the 2<sup>nd</sup> All Russia Congress on Nature Protection held in Saratov, Russia in June 1999

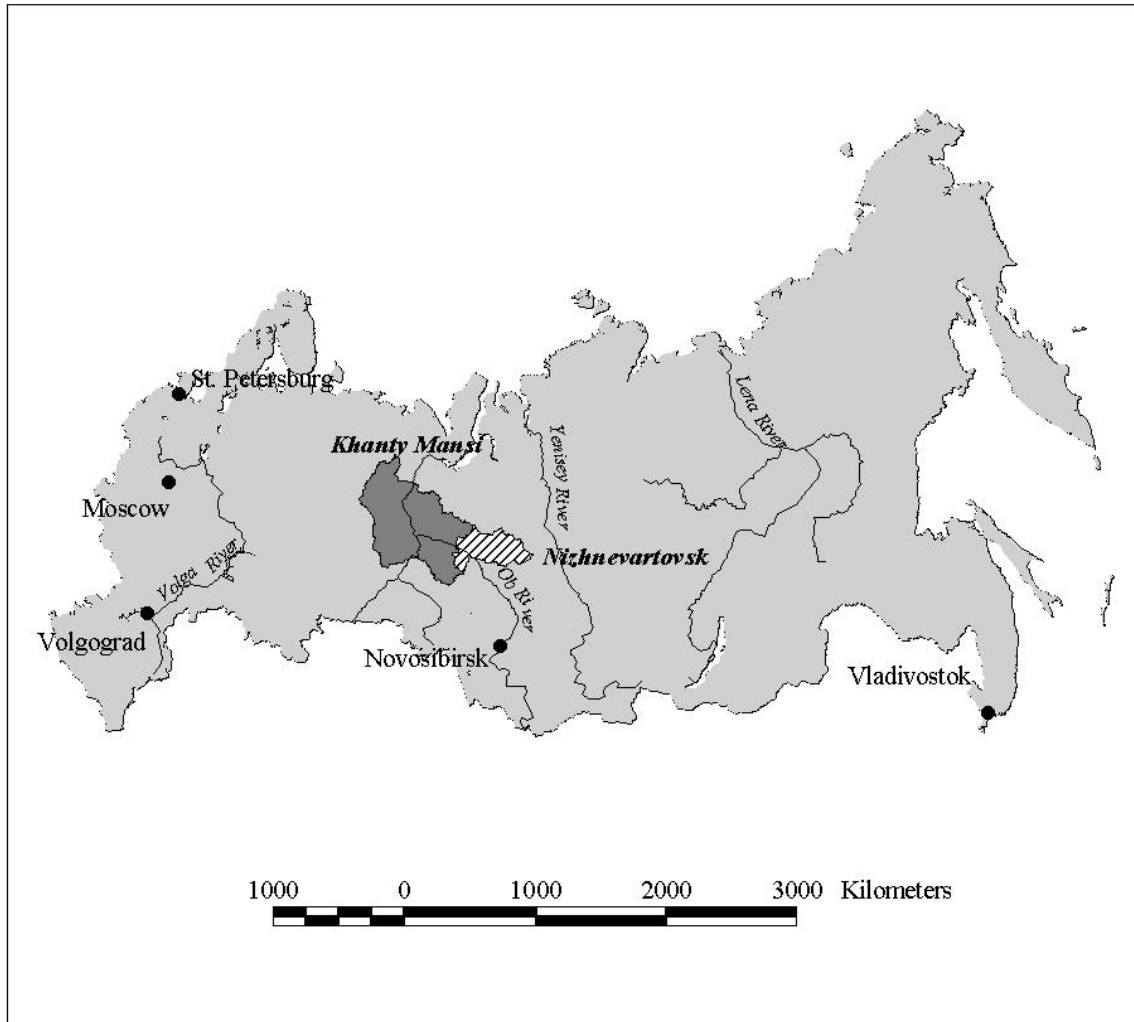
Table 5: How often does your NGO work with the following groups?\*

	always*	usually*	occasionally*	seldom or never*
scientists	70	22	4	4
educators	40	28	28	4
local elected officials	15	42	12	31
local govt. institutions	15	41	30	15
business/industry	0	8	46	46
local public	30	30	26	15
other Russian NGOs	42	23	31	4
international NGOs	38	19	31	12

\*The numbers in the table represent the percentage of respondents who selected the choices identified at the top of the column. Row totals may not add to 100 due to rounding.

\*\*Survey respondents are NGO attendees at the 2<sup>nd</sup> All Russia Congress on Nature Protection held in Saratov, Russia in June 1999

Figure 1. Khanty Mansi Autonomous Region and Nizhnevartovsk, Russia



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