CO-OPTION IN SIBERIA: THE CASE OF DIAMONDS AND THE VILYUY SAKHA[1,2]

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Abstract: A specialist on the Vilyuy Sakha, a native non-Russian people of northeastern Siberia, Russia, examines the public health and environmental challenges threatening the livelihood of the group. The paper presents a case study of political activism among the Vilyuy Sakha in the immediate post-Soviet period, as regional citizens were able to gain access to information on the pollution caused by diamond mining and other forms of industrial development. The demand for public health and environmental information, and mobilization against proposals for new mine development, emerged rapidly during the post-Soviet period, but disappeared almost as suddenly in the late 1990s. This paper explores the reasons for the disappearance of this evolving citizens' environmental movement, arguing that a major cause was co-option by elite diamond interests.

[1]The following case study is based on the author's last 12 years of work and research in the Vilyuy River regions of the western Sakha Republic, Russia. In 1991 and 1992, the author performed a contemporary analysis of the Sakha traditional summer festival, *yhyakh*, which comprised the field work for her master's degree in folklore from UNC-Chapel Hill. In 1993, she studied the indigenous Sakha language with support from an IREX on-site language training grant. In 1994, the author received a two-year grant (1994–1995 inclusive) from the John D. and Catherine T. MacArthur Foundation to direct a river-basin-wide environmental education initiative based at the Elgeeii Nature museum, a regional learning center on the Vilyuy. In 1996, she received a second two-year grant (1996–1997 inclusive), also from MacArthur, to direct a research policy project analyzing the environmental, cultural, and economic impact of new diamond mines scheduled to open in the Nyurba region. From 1999 to 2000 the author conducted doctoral research, a two-village study combining quantitative and qualitative methods analyzing Vilyuy Sakha household-level food production adaptations since the fall of the USSR. Statements in this case study not attributed to a published source are based on the author's personal observations and field work. Presently she is directing a three-year project, funded by Arctic Social Sciences of National Science Foundation entitled "Investigating the Economic and Environmental Resilience of Viliui Sakha Villages: Building Capacity, Assessing Sustainability, Gaining Knowledge."

[2]I dedicate this article to the late Pyotr Martinev, who taught me how one person with an environmentally and socially progressive vision can initiate change. My hope is that this article can be one of many reminders of what Pyoter did and serve as an example for others to carry his vision of environmental sustainability and social equity on the Vilyuy forward. I would also like to acknowledge all inhabitants of the Vilyuy Regions of the Sakha Republic, without whose help my ongoing research of the last 12 years would not be been possible. I especially wish to thank members of the Vilyuy Committee, past and present, and all specialists and representatives who gave their time and expertise concerning environmental issues on the Vilyuy. I also acknowledge my funding sources over the years including the John D. and Catherine T. MacArthur Foudation, the National Science Foundation (NSF), Fulbright-Hays, the Social Science Research Council (SSRC), the International Research & Exchange Board (IREX), and the American Association of University Women (AAUW). Lastly, but certainly not least, I thank the thorough and informative work of the journal's anonymous reviewers.

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Fig. 1. The Sakha Republic with detail of the diamond-mining areas.

INTRODUCTION

The Vilyuy Sakha are a native non-Russian people of the Vilyuy River region of northeastern Siberia who maintain a uniquely adapted horse and cattle breeding subsistence economy in the subarctic environment of the western Sakha Republic, Russia (Fig. 1). Within post-Soviet Russia, the Sakha Republic is unique as an emerging economic power, with strong ethnic representation in its state apparatus. The region, twice the size of Alaska, is rich in mineral wealth and natural resources.[3] These resources, largely developed during the Soviet period, today provide the Republic and the Russian Federation with sizeable income (Tichotsky, 2000). To some extent related to this economic power and to a substantial ethnic population, the Sakha, unlike other post-Soviet non-Russian peoples, have emerged on equal, and in some cases superior, footing with their Russian counterparts in controlling their Republic government and their social status within it (Balzer and Vinokurova, 1996). The Republic is also known for its environmental record, based on former President Nikolayev's according protected status to 20% of the Republic's land area. From the West, from Moscow, and from the capital city, Yakutsk, it appears that the Sakha Republic has overcome the hardships of the post-Soviet period with its robust economy and cutting-edge environmental policies.

[3]The Sakha maintain an old legend that when gods flying over the earth, dispensing all the natural resource wealth, got to the region that is today's Sakha Republic, it was so cold that they froze and the entire contents of their chest spilled out. Hence, to this day, all the elements of Mendeleyev's chart are said to be found within the Republic's borders.

However, there is a divergent side to this story. It involves understanding the environmental and socio-cultural impact of the Republic's achievements on the rural Sakha inhabitants living adjacent to its main industrial activities, in this case, diamond mining, and those inhabitants' struggle for environmental justice. Among Western coverage of the Sakha Republic's post-Soviet progress, research to date has made only partial reference to the local impacts of diamond exploitation, in one account referring to the colonization of native populations (Tichotsky, 2000), and in another focusing on the health impacts of industrial development (Marples, 1999; Espiritu 2002). What is lacking is a holistic historical and contemporary analysis of environmental and socio-cultural degradation due to diamond mining activity in the Vilyuy regions and a chronology of citizen activism surrounding those issues.

This paper begins with an introduction to the Vilyuy ecosystem and its early human settlement, followed by an analysis of the environmental impacts of the Soviet period. It next explores the environmental history of the Vilyuy regions based on information made available in the late Soviet and post-Soviet periods. Following this, the paper traces the beginnings, evolution, and co-option of the Vilyuy Committee, a regionally based citizen action group concerned with disseminating information, educating local inhabitants, and lobbying policymakers to improve environmental conditions of the Vilyuy region. Lastly, the paper draws on similar Russian and international cases to analyze why the Vilyuy environmental movement lost it momentum. It concludes with a discussion of what strategies are available to support efforts for Vilyuy environmental justice.

THE VILYUY ECOSYSTEM, INDIGENOUS ADAPTATION, AND RUSSIAN COLONIZATION

The predominant ecosystem of the Vilyuy watershed is boreal forest (taiga), consisting of larch, spruce, fir, pine, and birch. Other micro-ecosystems within this taiga biome give the Vilyuy regions a diverse fauna and flora, including *alaas* (a round field bordered by woods usually with a lake in the center), meadow and forest steppe systems, both with steppe flora, a sandy desert biome, swamplands, and, in the northern parts of the watershed, tundra with alpine meadows.

The climate of the Vilyuy regions is sharply continental, with winter temperatures uncommonly low[4] and summer temperatures comparatively high. Seasonal variations exceed 100°C, from +40°C during the summer to –60°C in winter. This extreme temperature range is a result of the area's northern geographic position; the direction, speed, and nature of air currents; its distance and protection from moderating water bodies; and of the character of its physical relief. Due to the latitudinal position at the 60th parallel, the annual change in day length is also extreme, with the shortest winter day at 4 hours and 14 minutes, and the longest day in summer of 19 hours and 45 minutes.

The main factor determining the hydrological characteristics of the Vilyuy regions is the presence of a continuous permafrost layer. During the summer season, the top layer of soil may thaw to the depth of 0.4–3.5 meters, while the ground below remains

[4]An extreme example of this is the Verkhoyansk region of the Sakha Republic, which boasts the lowest temperature recorded for a place of human habitation at -71.2°C (-96.2°F).

permanently frozen. Vertical movement of water in the soil is limited to the active unfrozen soil layer. The soil layer immediately above the permafrost is in a continuous state of super-saturation. Upper soil layers are moistened by capillary action pulling water up from this saturated layer. This provides supplemental moisture and is of great importance due to the low precipitation. The super-saturated layer also contributes to the swampy character of the landscape and the podzolic character of the soils.

Historically, human inhabitation of the Old World taiga regions, adjacent waterways, and coastal areas has been dominated by reindeer-herding and foraging cultures, due to the limitations of the high-latitude ecosystem for land cultivation and domestic animal breeding. Tungus (Even and Evenk) and Tumat, who preceded Sakha as inhabitants of the Vilyuy region, subsisted by means of a mixture of reindeer herding and foraging (hunting, gathering and fishing). They utilized the wild resources of this extreme environment across extensive land areas. Their population density was low and their subsistence practices had a relatively low impact on the natural environment.

The Sakha, a Turkic-speaking people who practiced horse and cattle agro-pastoralism, began settling in the Vilyuy regions in the 1400s (Ergis, 1974; Ksentofontov, 1992). Their Turkic ancestors transmigrated from Central Asia to the shores of Lake Baikal in the 800s and then, beginning in the 1300s, traveled north, following the Lena River to their present home (Okladnikov, 1970; Gogolev, 1986; Maak, 1994). Their subsistence practice was less "environmentally friendly" than their predecessors' and equally disruptive to the neighboring reindeer-herding, foraging cultures. From their earliest arrival in the Vilyuy regions, Sakha were known by the indigenous cultures as land-changers, who created more pasture by draining lakes and clearing forest by burning (Nikolaev, 1967). In the process, these practices destroyed the vast resource of natural lichen "fields," the main fodder for reindeer.

Russian colonization in the Vilyuy regions began in the mid-1600s and had its own reverberations on the local environment and cultures. Russian colonists annexed native lands and demanded *yasak* (fur tribute) from all local inhabitants, further burdening native peoples' subsistence demands and altering the natural populations of fur-bearing animals (Bassin, 1991). Although indigenous practices and colonization impacted the Vilyuy's natural ecosystem, it was the collectivization and industrialization of the Soviet period that made for the greatest environmental and socio-cultural damage.

THE SOVIET PERIOD

Collectivization

Collectivization began in the late 1920s and culminated in the late 1950s with the establishment of state farm agro-industrial systems. Over that 30-year period, the Vilyuy Sakha's formerly extensive and dispersed subsistence strategy, a historically based and ecologically founded subsistence adaptation based on kin-based clan groupings of scattered homesteads, was transformed to agro-industrial state production in densely populated, centralized village settlements. Similarly, land, in pre-Soviet times held in ancestral clan usufruct, was deemed state property.

The main effects of Soviet-period collectivization on Sakha pre-Soviet subsistence strategies include the breakdown of traditional family/clan interdependence, the loss of indigenous ecological knowledge, the loss of use of vast areas of land,

dependence on modern transportation to reach necessary resources, environmental stress in populated areas due to concentration of waste, and reorganization of local collectives into a centralized state farm whose sole objective was producing meat and milk for the nascent diamond industry. The impacts of collectivization altered the Vilyuy natural environment, but Soviet period industrialization had the most devastating effect.[5]

Industrialization

The foremost objective of the Soviet government following WWII was rapid industrialization (Forsyth, 1989). Just before that time, in 1941, geologist Victor Sobolev attested to the similarities of geologic structure in diamond regions of central and southern Africa, and that of the Vilyuy region. Spurred by the post-war need for industrial diamonds to supply the growing military-industrial complex, the Soviet government immediately invested substantial resources to find the expected diamonds (Duval et al., 1996). In 1949, the G. H. Feinshtein geological expedition first discovered diamond granules near the present-day town of Krestyakh in the Vilyuy River basin (Kharkiv et al., 1997) (Fig. 1).

In the years to follow, expeditions came regularly to locate more natural pipes of kimberlite. On August 21, 1954, the young geologist Lorisa Popugayeva discovered the first kimberlite pipe *Zarnitza*. In 1955, the diamond industry began mining the *Mir* and the *Udachnyy* pipes. In addition to finding diamonds in kimberlite columns, geologists also found substantial placer deposits in the Irelakh River, which ran adjacent to the *Mir* pipe. To extract these deposits the government built a "drag," an enormous machine, similar in appearance to a one block, five-story office building, to move up and down the river, dredging up the riverbed strata to sift and sort it for kimberlite.

Like all Soviet-period industrialization, the exploitation of diamonds was not confined by environmental laws and regulations, because those that existed were largely disregarded and were in themselves impotent, having been written by the industrial ministries and economic planners, whose priority at that time was industrial development (Peterson, 1993, p. 175).[6] From its beginnings, this new and extensive diamond mining industry required large amounts of electric energy, which the government provided following the construction of the Vilyuy Hydroelectric Station (Vilyuy GES) in Chernyshevskiy, the first hydroelectric power plant built on permafrost. The nascent diamond industry also required substantial manpower. The solution to the substantial manpower required for the industry was the "importation" of workers from outside the area, mostly from the Ukraine, Belorussia, and European Russia, a move that increased regional population and ethnic diversity.

Just as the Soviet period ushered in quantum change to the Vilyuy Sakha, the post-Soviet transition has had a similar effect. In the post-Soviet period, Vilyuy Sakha are

[5]In fairness, it should be noted that the Soviet period also brought many improvements to local inhabitants. These include literacy, medical care, sanitation and hygiene, social services, and improved access to consumer goods.

[6]With the advent of diamond mining in the Vilyuy regions, the main protocol of the recently established state farms was to produce meat and milk for the diamond industry, essentially colonizing Vilyuy Sakha as servants of the Soviet industrial complex.

forced to reconcile with the past on at least two levels, in terms of their daily subsistence survival and in terms of the substantial environmental disturbance of their homelands.

In terms of daily subsistence, with the loss of local employment and access to basic food products after the 1991 state farm dissolution, Vilyuy Sakha have developed a household-level food production system termed "cows-and-kin," focusing on keeping cows and exchanging labor and products with kin households. Cows-and-kin offers a sound mode of household-level food production for contemporary rural Vilyuy Sakha and represents a unique adaptation, which is historically founded, environmentally sustainable, and culturally resilient (Crate, 2003). Cows-and-kin is a tenacious adaptation but is also vulnerable to the changing conditions of contemporary life, most notably a disinterested youth, the loss of indigenous knowledge, and issues of land tenure. It is also compromised by the former and ongoing degradation of the environment.

THE POST-SOVIET PERIOD: RECONCILING WITH THE ENVIRONMENTAL LEGACY OF THE USSR

> The Sakha Republic suffered severe environmental damage in Soviet times when it was plundered for its diamond, oil and gold reserves. Diamond mining, for example, has polluted the Vilyuy River with traces of thallium and other toxic chemicals. In the '70's and '80's the river basin also experienced 11 underground nuclear tests, seven of which had a yield greater than or equal to that of the bombs dropped on Hiroshima, according to Sakha officials. Dead forests now surround the explosion sites and the permafrost is radioactive. (OMRI, 1997).

News clippings such as this, revealing the local reality of the outright disregard for the environment during the Soviet period, have become common across Russia in the post-Soviet setting. The Vilyuy regions are no exception. The area and its inhabitants were subjected to contamination from diamond mining, nuclear testing, and second-stage rocket debris. Although these activities had been ongoing since the late 1950s, the public was only privy to that knowledge beginning in the late 1980s. Even then, inhabitants were and continue to be left without full knowledge of the impacts on their and their children's lives that these Soviet legacies had.

What follows is an overview of the main environmental issues of the Vilyuy region, including: (1) the physical impacts of the Vilyuy hydroelectric dam and its adjacent reservoir: (2) the chemical contamination of the region's surface waters; (3) the nuclear contamination from fallout during the diamond company's holding pond dam construction; and (4) the chemical contamination from airborne rocket debris.

Impacts of the Vilyuy Hydroelectric Dam and its Adjacent Reservoir

The Vilyuy hydroelectric station (Vilyuy GES) and its adjacent reservoir have disrupted the Vilyuy River's natural ebb and flow, "softened" the local climate,

inundated native settlements and valuable land resources, and contaminated the surface waters with phenols.

The hydrostation's activity has changed the natural water regime of the watershed's streams and rivers (Shadrin, 1984). Water is released in excess to the watershed ecosystem during the frigid winter when electric energy demands are high. Conversely, in spring and summer, less than the natural flow of water is released as electric energy demand is lower and water reserves are retained. Additionally, released water originates from the reservoir's cold bottom, decreasing average downstream water temperatures (Nogovitzin, 1985). These disruptions alter habitat for numerous fish and animals, and in turn affect subsistence resources.[7]

The only pre-hydrodam "picture" of the river's ecosystem is anecdotal evidence offered by contemporary Sakha elders who speak freely of the change in the river below the dam since the reservoir was built.

> Before GES the river was FULL of water—an absolute abundance of water—and in springtime, especially, the river would swell to the brim and more so. Spring is also memorable for the waterfowl migration—they came in such numbers that you couldn't see the blue sky through the mass of birds. Now the former clouds of birds that flew through have been reduced to a trickle here and there. It's not that they have disappeared, but that they have changed their flight pattern (anonymous elder, 1994).

Similarly, Sakha elders describe the pre-hydrodam Vilyuy River as having crystal clear waters abundantly teeming with sturgeon, freshwater salmon, and other valuable fish species, now rarities. The river otter (*Lutra lutra* L.) and black or hooded crane (*Grus monacha*), once common to the Vilyuy and its tributaries, are gone (Andreev, 1987).[8]

The presence of the hydrodam may also be responsible for a local climate change. Inhabitants' testimony and some research support the claim that there has been a moderation of local climate; however, the research community cannot substantiate these claims without comprehensive data and proper measuring instruments.[9]

In the process of creating the reservoir, 356,000 acres of prime fields and woodlands[10] containing haying, pasturing and hunting areas and economically valuable timberlands, were lost. Additionally, the reservoir flooded indigenous settlements. About 600 people lived along the Chona River, a tributary of the Vilyuy, which flows north and follows the Republic's western border. The area, rugged with mountainous regions and raging rivers and streams, was seen as unsuitable for agriculture as Soviet

[7]This in turn changes the species composition downstream and above the reservoir.

[8]When governmental officials are confronted with these claims, they accuse the local inhabitants of overreaction and a tendency to be too emotional. Unfortunately, there is no statistical data about the densities of fish and animal populations before the dam to compare with contemporary times.

[9]It is reasonable to assume that the reservoir, with a surface area of 900 square miles and a mean holding capacity of 52,850 million cubic yards, would have some degree of local temperature-moderating effect when seasonal extremes fluctuate from -60°C to +40°C and back again. In interviews over the last 12 years, most Sakha elders have shared personal observations supporting the claim for a change in climate. These accounts claim that the climate is milder now, with winters not as cold and summers not as hot as they were before the hydro dam's construction.

[10]Further broken down, this included 334,880 acres of forests and shrubs, 5,683 acres of pasture, and 15,000 acres of swamp.

efforts grew to collectivize and consolidate adjacent farms. On account of its rugged topography and the need for regional hydropower, it was determined that flooding of these areas would be their most productive use.[11] The final impact of the hydrodam is chemical contamination of surface waters, discussed in the next section.

Chemical Contamination of Regional Surface Waters

Surface water contamination has polluted the Vilyuy River and its tributaries. There are three main sources of such contamination: phenols, thallium, and highly mineralized brine water. The waters of the reservoir flooded 965 square miles of taiga, pasture, and swamp, none of which had been cleared prior to submersion, which resulted in the anaerobic decomposition of vegetation and released phenols and copper into the reservoir waters and the adjoining Vilyuy basin.[12]

Thallium contamination resulted from the use of liquid "klerich," a highly toxic thallium-containing compound used to separate diamond granules from their natural substrate, kimberlite.[13] Klerich-rich wastewater was emptied into surface water systems and thallium contamination proceeded. In an effort to contain thallium contamination, in 1986 the diamond industry installed holding ponds to contain the wastewater. The thallium-containing water was then piped to these ponds where it was decontaminated after passing through a series of specialized filters. Investigations since that time have shown that the system is ineffective.[14]

The third source of surface water contamination is highly mineralized brine water, which seeps up from under the permafrost layer and collects at the bottom of mined diamond pipes.[15] High in salts and metallic elements such as copper, chromium, nickel, iron, zinc, and lead, until 1986 the brine was dumped directly into the surface water system. Since then, diamond mining enterprises have experimented with

[11]Local residents, most of whose ancestors had inhabited the Chona River area for generations, protested the flooding. But the Soviet authorities gave them no choice and, over a period of several years, subdued their outrage by promising that their relocation to areas near large towns and cities would raise their standard of living. From the early 1960s, Chonians began to relocate.

[12]Research claims that phenol levels have now stabilized (IAE, 1993). What effect the decades of phenol and copper contamination had on the river and inhabitants remains unresearched and undocumented. One of the problems with phenol contamination of water is that when phenols mix with chlorine, the latter used routinely to purify water for drinking purposes, they form dioxin, a highly carcinogenic substance. Another problem is the phenols tend to turn the river water red, which reduces light infiltration and affects the life cycles of the river's biota. This may be the reason why the pre-hydrodam river had 26 species of fish, and now there are only 6 (Crate, 1995, p. 11).

[13]Thallium is readily absorbed and is toxic to the human metabolic system (IAE, 1992). Thallium poisoning is first diagnosed by unexplained hair loss and leads to severe neurological damage and death. Normal blood thallium levels are under 2 milligrams per liter with concentrations greater than 100 milligrams per liter being considered toxic (Moore et al., 1993). By the early 1990s, due to public outcry, the industry discontinued their use of klerich and began using only mechanical methods.

[14]A study by the Institute of Applied Ecology (IAE, 1993), based in the capital of Yakutsk and actively performing research in the Vilyuy regions, found 5 times the safe levels of thallium in the river water and 14 times the safe levels in the sand and soils along the shoreline. Thallium, like all metals, tends toward sorption onto organic (detritus) and inorganic (clay, sand, etc.) particles and is found throughout the Vilyuy River bottom. Although, as noted above, the diamond industry has since discontinued the use of klerich and now processes the diamonds using only mechanical means and a closed water system, it is projected that past klerich use will contaminate the Vilyuy for centuries. The Institute of Applied Ecology has since found levels of thallium in the Vilyuy regions ranging from 9 to 800 times those allowed (ibid.).

[15]The diamond pipes continue hundreds of meters into the earth, far below the permafrost layer.

various methods of containment and "proper" disposal, all of which have continued to contaminate the ecosystem (IAE, 1993; Crate, 1995, p. 11).

Nuclear Contamination from Fallout during Dam Construction

Between 1974 and 1987, the Soviet government performed a dozen secret underground nuclear tests in the Vilyuy regions. Then in 1987, an insubstantial newspaper article about the blasts prompted citizen concern and after persistent inquiry, the state acknowledged that 2 of the 12 explosions, "Kristall" and "Kraton-3," were accompanied by catastrophic above-ground nuclear fallout (Burtzev, 1993).[16]

In 1990, state specialists, and soon after them researchers from the Russian Academy of Sciences, investigated the situation and revealed levels of cesium-137, strontium-90, and plutonium-239 and -240 in the soil, rain, lichens, tree bark, and adjacent water systems (Pavlov and Afanaseeva, 1997). The plutonium contamination, considered the most deadly of all, was verified at levels equivalent to the maximum contamination of soils in Belorussia and Ukraine following the Chernobyl' accident (Yablokov, 1992). Although it was common knowledge that this research was going on, local inhabitants were not informed of the extent of plutonium contamination until 1993 (Pavlov and Afanaseeva, 1997). Despite the life-threatening level of radiation released by the accidents, to this day there has yet to be a comprehensive study of these two sites.

Chemical Contamination from Airborne Rocket Debris

Since 1958, the Nyurba region of the Vilyuy watershed has been the designated drop-off area for the second stage of space exploration rockets launched from the Baykonur Cosmodrome in Kazakhstan. The exact number of rocket drops over the Vilyuy regions is, to this day, a secret.[17] The shed rocket parts emit highly toxic gases containing heptyl (dimethylhydrazine),[18] which contaminate the taiga and indigenous settlements. The Vilyuy inhabitants consider this contamination a link to the rise of

[16]The lesser of the two, called "Kristall," occurred in 1974, just 1.5 miles from the industrial town of Udachnyy. It was the first of eight explosions planned to free the subsoil of permafrost to facilitate construction of a dam for one of several waste filtration ponds of the Udachnyy diamond industry. To accomplish this, the company's engineers located the detonation points an unconventionally shallow 325 feet underground. After the catastrophic fallout of the first explosion, the remaining seven explosions were canceled. The second and more severe episode of fallout, following the "Kraton-3" explosion, occurred in 1978, a mere 600 feet from the shore of the Markha River, a major tributary of the Vilyuy. The explosion was of the same magnitude as the bomb dropped on Hiroshima in 1945 (Pavlov and Afanaseeva, 1997), at 19 kilotons (Burtsev and Kolodoznikova 1997). It is considered as "constituting one of the most serious problems in the history of nuclear explosions" (Yablokov, 1992). The river is a major source of drinking water for villages that border it. Today, plutonium-239 levels can be found that measure higher than those in Chernobyl'. There was no recording of the levels in 1978 when the explosion occurred.

[17]According to the testimony of the local veterinarian who has practiced in the Vilyuy region for 40 years: "From 1983 the rockets fell—in October 60 fishermen saw the rocket and after that they saw . . . . 4, 6, 8 pieces. In 1991 the Baykonur representatives came and openly said that only 3 fell but we have seen more and see the effects on our animals. Our region—in 1995 a cow was born without a skin—then a 2 headed calf, and another. This year another—we have never had this before. There are many more examples of this . . " (author's interview with A. Tobonov, 1997, in Nyurba).

[18]The International Agency of Research on Cancer has classified dimethylhydrazine as a possible carcinogen to humans [http://www.epa.gov/ttn/atw/hlthef/dimethyl.html].

cancer in their populations since the late 1970s. Local hunters report findings of entire herds of dead animals and flocks of birds in the taiga where the rockets fall.[19]

Official Efforts to Reconcile Environmental Issues of the Vilyuy Region

Based on the record of environmental abuses to the Vilyuy ecosystem and its inhabitants, life on the Vilyuy continues to entail a myriad of reverberations from both the industrialization and collectivization of the Soviet period and changes of the post-Soviet times. In the post-Soviet context, the Russian state is accountable for the environmental damage of the past and is taking some steps to reconcile the situatio, mainly in two directions: (1) to fund and organize remedial environmental projects in the Vilyuy region, using a percentage of profits from diamond sales; and (2) to support environmental programs coordinated by the Sakha Ministry of the Environment.

In 1993, the Sakha government and the Sakha-Russian Diamond Company (Almazy Rossii-Sakha) established the financial corporation *Sakha-almaz-proinvest* (SAPI) to fund remedial environmental programs for the Vilyuy region. Since its beginnings, SAPI reportedly was fraught with issues of state-level, regional, and local money laundering.[20] SAPI funds were often depleted at the regional level, before even reaching village populations, who were those often most affected by environmental contamination. After its first five years in operation, SAPI's reputation was well known. Former Sakha Republic President Mikhail Nikolaev reportedly observed in 1997: "We await good work from SAPI."[21]

Perhaps in response to the bad press they were receiving, in 1997 SAPI reported a host of environmental programs such as expeditions throughout the Vilyuy to study indigenous health, preliminary planning for a monitoring system for drinking water in the Vilyuy region, creating a series of geographic-ecological maps for the diamond mining areas, laying the methodological groundwork for the development of ecological insurance for the areas, and several cooperative efforts with the Ministry of Ecology conducting research on the region.[22] However, there was a clear conflict of interest, with the diamond company conducting the studies.

In 2001, SAPI was dissolved and the operation was placed into the "Tselovoy Fond, a controlled government department . . . to ensure that the money has a definite address," commented Vasili Alekseev, Minister of Ecology.[23] But how is the new money being used? Alekseyev and his regional representatives all agree that the first and foremost need of Vilyuy inhabitants is good drinking water. However, none can show that the Tselovoy Fond plans to finance water filtration systems in the regions. Presently, the monies are allocated to develop gas, oil, and high voltage electricity development in the regions.

Beginning in the mid-1990s, the Sakha Ministry of the Environment began a major effort to monitor the Vilyuy ecosystem. In 1993, the Russian Federation established a federal ecological monitoring system with many regional systems coming under the federal wing, including the Sakha Republic in 1996. The program objective

[19]Information from the author's field notes for 1997 and 2000.

[20]Author's interview with A. Romanov, 1997, in Nyurba.

[21]Author's interview with V. G. Alekseyev, 1997, in Yakutsk.

[22]Author's interview with V. G. Alekseyev, 2003, in Yakutsk.

[23]Author's interview with V. G. Alekseyev, 2003, in Yakutsk.

for the Vilyuy watershed is stated as: "to provide objective informational support to assist the state organs, industrial decision-makers, agricultural sector and inhabitants with data regarding the ecological conditions in the region's territories" (Ministry of Ecology, 1997). Due to the lack of comprehensive data, the project also considers original research to fill these informational gaps a high priority.

The Ministry, having confirmed that the Vilyuy regions sustained major environmental damage, developed regulations to prevent further damage and initiated the Vilyuy monitoring project. However, with the late 1990s economic downturn, the Ministry became financially strapped and underwent a 50% layoff, a terrible loss for an organization trying to watchdog a Republic twice the size of Alaska. In 2000, Russian President Putin consolidated the Ministries of Environment and of Natural Resources into one and set this new body's priority as the exploitation of natural resources as Russia's main source of economic renewal.

Any pressure on the government to intensify monitoring and information-gathering efforts falls on deaf ears since government bureaucrats tend to downplay the ecological issues on the Vilyuy based on a lack of "conclusive evidence" (Marples, 1999; Tichotsky, 2000; Crate, 2001). As a result, local inhabitants remain concerned about the effects to their and their children's lives. Have concerned Vilyuy citizens protested these abuses and pressured their government for environmental justice, like others have done in post-Soviet Russia? The answer is "yes." In the early 1990s, there was a powerful environmental movement in the Vilyuy region. However, after over a decade of hard work and gaining substantial headway, elite diamond interests have co-opted the movement. What enabled this citizen activism to emerge and to bring to light the many local environmental and social problems? What were the reasons for this activism's disappearance or descent into apathy? The answers to these questions comprise the following section of the paper.

THE BIRTH AND DEMISE OF THE VILYUY COMMITTEE

In the late 1980s, on the heels of *glasnost'* (openness) and *perestroyka* (restructuring), inhabitants across the Soviet Union first gained access to information about the environmental offenses of the Soviet period. Empowered by this information, like so many across the FSU, in 1989 concerned citizens and representatives of the Yakutsk's scientific/intellectual community founded a public ecological center to research and disseminate information about the environmental legacies of their homelands. In the fall of 1989, the center organized a republic-wide conference to discuss ecological problems and to form regional watershed-based organizations to initiate local activism. Many concerned residents of the Vilyuy region were in attendance and there was much discussion and interest in the complex of environmental issues on the Vilyuy. One of the watershed organizations formed during the conference, the Vilyuy Committee, focused on the Vilyuy watershed. Later that fall, the Vilyuy Committee and Public Ecological Center organized a conference in Mirny, the diamond mining center, to meet with representatives of Almaz-Rossia-Sakha (ALROSA) the Russian-Sakha diamond mining conglomerate.[24]

[24]It was at this meeting that the initial plan was set to allocate 2% of profits from diamond revenues toward the environmental remediation of the Vilyuy region, a decision that was realized with the 1993 establishment of the SAPI fund.

Since the Vilyuy Committee had started its work under the auspices of the Public Ecological Center in Yakutsk, it already had substantial support of many government representatives and had received a lot of coverage in the press: "Our press supported us and played a big role in getting the word out," commented Lyubov Yegorova, one of the original founders of the Vilyuy Committee. "Soon the whole Republic knew about 'The Tragedy of the Vilyuy'—and all the other things they called it—everyone knew about what was going on—we kept talking about the problems—then in 1991, with the help of the Committee to Save the World and the Sakha Minister of Ecology—and we shot a film about it—the radiation problems and all the ecological problems—we were working—we gathered a lot of money by showing the ecological problems throughout the Republic."[25]

During this time, concerned citizens throughout the Vilyuy regions initiated local chapters of the Vilyuy Committee and began taking action by organizing village meetings and discussing environmental concerns and contentions. At first, these public meetings were largely soapbox venues—a time to gather the local citizenry and express anger and disdain at the damage done. As the committee matured, regional representatives organized scientific conferences and drafted citizens' petitions to the government.

In 1993 a new guiding member, Pyotr Martinev, experienced in the technology of diamond transport and passionate about citizen advocacy, joined the committee. Martinev traveled with most of the ecological expeditions, researching the nuclear accident sites in the Vilyuy. He also traveled frequently to Yakutsk to meet with representatives in the republic parliament and Russian State Duma. It was under his leadership and vision that the committee became actively involved in the legal process. A life-long resident of the Nyurba region, where the diamond company found new mines to exploit in 1994,[26] Martinev focused all of his efforts toward opposing the new mining ventures. He took every opportunity to speak openly about his conviction

[25]Author's interview with Lyubov Yegorova, Yakutsk, June 6, 2003. Former Sakha President, Mikhail Nikolayev also played an advocacy role by writing an article in the Russian newspaper *Moskovskiye Novosti* (July 5, 1992) about the atomic explosions on the Vilyuy—he supported the Vilyuy Committee movement.

[26]In the 1990s, Almazy Rossii-Sakha, eager to find new kimberlite pipes to exploit since their original mines would soon be used up, announced their discovery of "the biggest diamond column in the Vilyuy region," and began preparing the area. In the process they discovered a second pipe adjacent to the first one. Both were located a relatively short distance from several indigenous populations in the Nyurba region on the Vilyuy. Local inhabitants openly voiced their opposition to these new mines, claiming that their settlements had already received their share of environmental damage from previous mining activity. The company assured the public that they would abide by full environmental protection, including impact statements and monitoring, but based on past history, the majority of Vilyuy inhabitants did not believe such promises. The then-Ministry of the Environment in Sakha promised to conduct extensive monitoring of the new diamond area prior to major mining activity, arguing that in this way they could take appropriate measures if any contamination were observed. This plan to establish a "before" picture as a baseline to measure contamination levels had strong support from concerned local citizens, who pointed out that damage by earlier mine sites could not be documented because there no such "before" picture was recorded 40 years ago (author's interview with P. N. Martinov, Nyurba, 1996). However, the Ministry never began the project due to a lack of financial resources. One positive change from the past in the new mining endeavors is at the regional level. The Nyurba regional government established an official partnership with the diamond company on July 15, 1997. According to this agreement, the region gets the right to buy 10% of the company stock, and the company will fund new schools and hospitals, better roads, and make efforts to support an overall increase in the standard of living (author's interview with V. A. Petrova, Nyurba, 1997).

that these new diamond reserves needed to be mined only after the diamond company had adopted environmentally safe technology and had justly appropriated a percentage of the diamond profits to Vilyuy inhabitants. In 1996 he spearheaded several referendums that impeded the diamond industry's plans to exploit new diamond pipes, based on their failure to perform comprehensive environmental impact assessments. But these only temporarily set back Almazy Rossii-Sakha's plans. In 1997 Pyoter Martinev died an untimely death after a several year struggle with liver cancer. With this loss the Vilyuy Committee suffered a severe setback. Martinov was the guiding vision and force behind the committee. His energy inspired others and his organizational skills maintained a distinct pathway for all to follow.

Deterred by the ineffectiveness of their referendum efforts and with the loss of their main leader, in the months that followed many of the original Vilyuy Committee members left the organization. This was also a time of active propagandizing by the diamond mining interests. Between 1997 and 1999 Vilyuy citizens were told outright that if they pushed their rights to a clean environment too far, that they would risk losing their state salaries, subsidies, and pensions. While conducting research during this span of years, it became evident to me over time that this propagandizing was effective. I witnessed an active and concerned citizenry turn into a silent and apathetic one over the course of those two years.

The regional representatives of the Vilyuy Committee also changed markedly. While the committee was preparing to celebrate its 10th anniversary in 2000, a complete turnover of membership produced new priorities that were anything but environmental activism. The new personnel, all key figures in regional economic development, transformed the Vilyuy Committee from an environmental NGO focused on involving the citizenry in environmental activism, to a bureaucratic board of local officials who gather privately to discuss their plans. In short, the active environmental agenda of the original Vilyuy Committee had been successfully co-opted.

ENVIRONMENTAL VICTORIES IN POST-SOVIET RUSSIA AND BEYOND: A RECIPE FOR SUCCESS?

How does this case contrast with successful cases redressing environmental problems in other parts of Russia and the Circumpolar North?[27] In the early 21st century, inhabitants, scientists, and researchers of the Circumpolar North have come to share a deep concern about the future viability of the Earth's northern ecosystems. Human impact in the Circumpolar North, until recently, has been local and minimal. For millennia, northern cultures have depended on wild resources, herding caribou and reindeer, hunting, fishing, and foraging. Industrialized societies have relied on the more temperate regions of the Earth for resource exploitation. However, the end of the 20th century witnessed an unprecedented rise in pressure on northern ecosystems for natural resources in developed countries. This has resulted in negative impacts on the ecosystem and its human inhabitants, including environmental degradation and loss of indigenous ways of life due to infringements on their lands, subsistence resources, and knowledge systems.

[27]The term Circumpolar North includes both the arctic and subarctic areas of the Northern Hemisphere (Nuttall, 1998, pp. 21-22).

Since the late 1980s, the eight circumpolar countries—Norway, Sweden, Finland, Iceland, Greenland, Russia, Canada, and the United States—have entered into cooperation on many levels to address their common problems, including: issues related to globalization and increasing pressure on northern resources; environmental impacts on the sensitive arctic ecosystem and global change; indigenous rights to lands, resources, and a healthy environment; and building locally sustainable economies (Nuttall and Callaghan, 2000). Although Russia shares these concerns with its arctic neighbors, it is the only country of the circumpolar eight that bears complex post-Soviet issues related to the environmental and social impacts of both Soviet collectivization and industrialization. These issues continue in the contemporary context of post-Soviet economic decline in concert with the lack of an effective legal apparatus to enforce laws pertaining to environmental and human rights. As in the case of diamonds and the Vilyuy Sakha, within Russia, native peoples' struggle for protection from and resolution of their environmental predicament often goes unheard and is overpowered by new economic priorities to exploit resources with minimal attention to environmental laws.

Over the past decade, concerned citizens of Russia have made substantial environmental progress, under the facilitation of international NGOs, to build a civil society, considered the essential first step to successful environmental movements (Soubotin, 2002). There are also cases of success in redressing environmental problems within Russia. The key to each successful movement is the presence of a strong urban base and of international representation. One need only look at the web pages of United States NGOs such as The Initiative for Social Action and Renewal in Eurasia (ISAR), Pacific Environment, Sacred Earth Network (SEN), World Wildlife Fund (WWF), etc., to understand how key this international/ urban connection is.

In the context of environmental redressing and indigenous peoples (IPs), many victories can be cited through the work of the Russian Association of Indigenous Peoples of the North (RAIPON), an association of Russia's numerically small peoples,[28] founded in 1990. The organization has a central office in Moscow and seeks ways to work with the Russian government. Much of RAIPON's success is due to its international status as a permanent member of the Arctic Council and it special consultative status in the United Nations Economic and Social Council (ECOSOC). Similarly, it has improved its political and executive structure primarily through funding from international projects (Kohler and Wessendorf, 2002, p. 26).

RAIPON's strategy of action in Moscow and other centers across Russia includes getting indigenous representatives into positions of public office and influencing state authorities through the dissemination of information (lobbying) and court appeals. In the regions RAIPON focuses on, local representatives facilitate seminars to educate residents on environmental and legal issues, organize negotiations between RAIPON and managers of environmental protection organizations and industry, and assist in the organization of civil actions and collective appeals in cases of illegal industrial acts. RAIPON also disseminates information about its activities and court precedents, and about the infringement and protection of indigenous people's rights through its "Indigenous World-Living Arctic" publication.

[28]The accepted limit of "numerical smallness" was decided in 1992 to be 50,000. There are 40 peoples in Russia's North so recognized, totaling 300,000 people, with the largest group being the Nenets at 35,000 (Kohler and Wessendorf, 2002).

One stellar case of environmental redress through RAIPON's efforts is the establishment of the Tkhsanom Specially Protected Natural Territory of Traditional Natural Resource Use (TTNRU), located in the Koryak Autonomous Okrug of Kamchatka in Russia's Far East and encompassing 2,100,000 hectares (Kohler and Wessendorf, 2002, pp. 224-245). The key to the 1998 establishment of the territory was local leadership and vision, the knowledge and use of environmental and indigenous legislation to protect the area, the involvement of the Itelmen' Revival Council, the local indigenous RAIPON group and RAIPON's Moscow representation, and support by international organizations, most notably World Wildlife Federation. However, in the swiftly shifting tides of Russian internal politics and economic reform, a short two years after establishment of the territory, the new governor of the okrug abolished the territory's status to open the area for industrial development of its natural resources. The key to continued protection of the area is legal coordination between the Tkhsanom communities through their work in the Itelmen's Revival Council, RAIPON, and international pressure to make use of the new federal laws that ensure their rights to the historical lands of their ancestors and to protect the environment of their inhabitancy.

In sum, the keys to redressing of environmental issues in post-Soviet Russia include a strong urban base, international contact, local leadership, and a knowledge of and ability to take advantage of existing legislation. These are the same characteristics that predated the redressing of environmental issues in other parts of the Circumpolar North (Young and Osherenko, 1993). For example, power has devolved from central governments to indigenous communities in Greenland/Denmark with the establishment of Home Rule, and in parts of Canada through comprehensive land claims and political settlements including extensive use of co-management. In many ways Russia is left decidedly behind its northern neighbors.

Herein lie the blessing and the curse. The northern ecosystems of the eight circumpolar countries are inextricably linked through global weather patterns and movements of oceanic waters, and thereby are exposed to Russia's transboundary air and water pollution. This underscores the urgent situation of Russia's environmental legacy for its northern neighbors. Hope comes from the potential outcomes of cooperation among northern countries that have experience in abating similar issues in their own homelands. Some have taken an active role in assisting.[29] Similarly, indigenous rights lag far behind the other seven countries' advances. Indigenous and native peoples of Russia continue to struggle with resource infringement and second-class status.

IMAGINING A FUTURE OF ENVIRONMENTAL JUSTICE ON THE VILYUY

What can we now say about Vilyuy Sakhas' way out of their environmental predicament? What were the movement's strengths and weaknesses? The Vilyuy

[29]There is broad support for nuclear waste disposal in Russia by the Norwegian government. The Bellona Foundation, a private nonprofit organization headquartered in Oslo, is active in Russia on issues of nuclear waste disposal. "The threat constituted by Russian nuclear waste deposits and discarded nuclear reactors is enormous. Bellona put the nuclear threat on the international agenda, and now we work with determination to get rid of it" [www.bellona.no].

Committee had many of the salient features of contemporary successful environmental movements in Russia, including a strong urban base with support and interest by elected officials, knowledge and use of existing environmental legislation, and a strong local leadership. What went wrong? There are several moments to contemplate. First, a series of failed referendums that served only to stall the mining company's operations. Perhaps if the Vilyuy Committee had some central representation in Moscow and on the international front, there could have been sufficient pressure to carry through these legal processes. The second crucial moment was the loss of Pyotr Martinev, whose guiding vision and unfailing vigilance was central to the Committee's success in the mid-1990s. Lastly, and most significantly, was the co-option of the movement by elite diamond interests involving both the deliberate subduing of its citizens' nascent environmental movement through repeated threats to their economic livelihood should they act in favor of environmental protection, and the appointment of bureaucrats to the empty seats left in the regional chapters of the Vilyuy Committee when citizen activists left following Martinev's death in 1997, a move that rendered the committee politically impotent.

What are the chances of reviving this vital citizen movement and work towards realizing environmental justice in the Vilyuy regions, or will it remain a relic of activism gone to apathy and a clear example of co-option by elite diamond interests? Based on the success stories described above, for the Vilyuy Committee to revive its original vision of environmental protection and justice, it needs more outside contact including representation in Moscow and on the international front. As also detailed above, much of the successful environmental redressing for Russia's IPs is through their coordinated efforts with RAIPON. However, Sakha are not a numerically small people, a factor that precludes this as an option. The strong support by political representatives in Yakutsk that the committee enjoyed during its formative years, like the committee's regional representation, has been replaced with elite diamond interests. This leaves finding support and interest from an international and/or Moscow-based group as the Vilyuy Sakhas' main hope in reviving their environmental movement. This is a strong possibility given the establishment of many international NGOs with representation in Moscow. Similarly, there is a growing concern in the international community for the health of our circumpolar environment. The Vilyuy River is a major tributary of the Lena and thereby contributes to the biological health of the Lena Delta and the Arctic Ocean environment. Once international attention is focused on this fact, the inhabitants of the Vilyuy can move forward and take up the fight they began in the early 1990s for a healthy environment for generations to come.

LITERATURE

Andreyev, B. N. *Ptitsy Vilyuyskogo basseina* (*Birds of the Vilyuy Basin*). Yakutsk: Knizhki Izd., 1987.

Balzer, M and U. Vinokurova. "Nationalism, Interethnic Relations, and Federalism: The Case of the Sakha Republic," *Europe-Asia Studies*, Vol. 48, No. 1, 1996, p. 101-120.

Bassin, Mark. "Inventing Siberia: Visions of the Russian Far East in the Early Nineteenth Century," *American Historical Review*, June 1991, pp. 763-794.

Burtzev, I. S. *Yadernoye zagryazneniye Respublika Sakha: Problema yadernaya bezopasnosti* (*Nuclear Contamination of the Sakha Republic: The Problem of Nuclear Safety*). Yakutsk: Polygraph, 1993.

Burtzev, I. S. and E. N. Kolodoznikova. "Sovremennaya radiatsionnaya obstanovka na ob'yektakh avariynykh podzemnykh yadernykh vzryvov (Contemporary Radiation Conditions at the Objects of Catastrophic Underground Atomic Explosions)," in: N. P. Pavlov and V. M. Afanaseyeva, eds., *Bol' i tragediya sedogo Vilyuya* (*The Pain and Tragedy of Old Vilyuy*). Yakutsk: SAPI-Torg-Knigi, 1997.

Crate, Susan. "Vilyuy Sakha Post-Soviet Adaptation: A Subarctic Test of Netting's Smallholder, Householder Theory," *Human Ecology*, Vol. 31, No. 4, Winter 2003.

Crate, Susan. *Cows, Kin and Capitalism: The Cultural Ecology of Vilyuy Sakha in the Post-Socialist Era*. Ph.D. dissertation, University of North Carolina, Chapel Hill. 2001.

Crate, Susan, ed. *Kwek Tiin* (*Green Spirit*). Yakutsk: Bichik, 1995.

Duval, D., T. Green, and R. Louthean. *The Mining Revolution.* London, UK: Rosendale Press, 1996.

Ergis, G. *Ocherki po Yakutskomy Folklory* (*Essays on Yakut Folklore*). Moscow, Russia: Science Publishers, 1974.

Espiritu, Aileen A. "The Local Perspective: Interviews with Sakha in the Vilyuy River Region," *Central Eurasian Studies Review*, Vol. 1, No. 1, 2002, pp. 15-17.

Forsyth, James. "The Indigenous Peoples of Siberia in the 20th Century," in: Alan Wood and R.A. French, eds., *The Development of Siberia*. London, UK: MacMillan, 1989, pp. 72-95.

Gogolev, A. I. *Istoricheskaya etnografiya yakutov* (*The Historical Ethnography of the Yakut*). Yakutsk, Russia: Yakutsk State University, 1986.

IAE (Institute of Applied Ecology). *Ekologiya basseyna reki Vilyuy: Promyshlennoye zagryazneniye*) (*The Ecology of the Vilyuy River: Industrial Pollution*). Yakutsk, Russia: Siberian Russian Academy of Sciences, 1992.

IAE (Institute of Applied Ecology). *Ekologiya reki Vilyuy: Sostoyaniye prirodnoy sredy i zdorov'ye naseleniya* (*The Ecology of the Vilyuy River: State of the Natural Environment and Human Health*). Yakutsk, Russia: Siberian Russian Academy of Sciences, 1993.

Kharkiv, A. D., N. N. Zinchuk and V. M. Zuyev. *Istoriya almaza (The History of Diamonds*). Moscow, Russia: Nedra, 1997.

Kohler, Thomas and Kathrin Wessendorf, eds. *Towards a New Millenium: Ten Years of the Indigenous Movement in Russia*. Copenhagen, Denmark: IWGIA. 2002.

Ksentofontov, G. V. *Urankhai Sakhalaar* (*Points in Ancient History of the Yakut [Sakha]*). Yakutsk, Russia: Sakha Republic Publisher, 1992.

Maak, R. K. *Vilyuyskiy okrug* (*The Vilyuy District*), 2nd ed. Moscow, Russia: Yana, 1994.

Marples, David R. "Environmental and Health Problems in the Sakha Republic," *Post-Soviet Geography and Economics*, **40**, 1:62-77, 1999.

Ministry of Ecology. "Tekhnikoekonomicheskoye obosnovaniye sistemy ekologicheskogo monitoringa Vilyuyskogo regiona (The Technical and Economic Basis

for the System of Ecological Monitoring of the Vilyuy Region).” Unpublished governmental document, Ministry of Ecology, Yakutsk, 1997.

Moore, D., I. House, and A. Dixon. “Thallium Poisoning,” *British Medical Journal*, Vol. 306, No. 6891, 1993, p. 1527.

Nikolayev, S. I. *Yakutia: Sketches of Life and Subsistence*. Yakutsk, Russia: USSR Academy of Sciences, Siberian Branch, Fond 5, Op. 1, Delo 501, 1967.

Nogovitzin, D. D. *The Water Resources of Yakutia and Their Use.* Yakutsk, Russia: USSR Academy of Sciences, Siberian Branch, 1985.

Nuttall, Mark. *Protecting the Arctic*. Amsterdam, Netherlands: Harwood Academic Press, 1998.

Nuttall, Mark and Terry Callaghan, eds. *The Arctic: Environment, People, Policy.* Amsterdam, Netherlands: Harwood Academic Press, 2000.

Okladnikov, A. P. *Yakutia*. London, UK: McGill-Queen’s Press, 1970.

OMRI (Open Media Research Institute), *Russian Regional Report*, February 12, 1997 [http://archives.tol.cz/Publications/RRR/Index.html].

Pavlov, N. P. and V. M. Afanaseyeva, eds. *Bol’ i tragediya sedogo Vilyuya* (*The Pain and Tragedy of Old Vilyuy*). Yakutsk, Russia: SAPI-Torg-Knigi, 1997.

Peterson, D. J. *Troubled Lands: The Legacy of Soviet Environmental Destruction*. Boulder, CO: Westview Press, 1993.

Shadrin, A. P., ed. *Antropogennoye vozdeystviye na vodnyye resursy Yakutii* (*The Human Impact on the Water Resources of Yakutia*). Yakutsk, Russia: Russian Academy of Sciences, Siberian Branch, 1994.

Soubotin, Xenia. “Building Civil Society through Environmental Advocacy.” Paper presented at the conference on Russia’s Environment: Problems and Prospects, October 24–26, 2002, Miami University, Oxford, Ohio.

Tichotsky, John. *Russia’s Diamond Colony: The Republic of Sakha*. Amsterdam, Netherlands: Harwood Academic Publishers, 2000.

Yablokov, A. V. “The Recent Environmental Situation in Russia,” *Environmental Policy Review*, Vol. 6, No. 2, 1992, pp. 1-12.

Young, Oran and Gail Osherenko. *Polar Politics: Creating International Environmental Regimes*. Ithaca, NY: Cornell University Press, 1993.