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Hydrostrategy, Hydropolitics, and Security in the Kura-Araks Basin of the South Caucasus

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Abstract: After the Soviet Union's dissolution, the Kura-Araks Basin became an international river basin with respect to the South Caucasus states of Armenia, Azerbaijan, and Georgia. Despite differences among these countries, they depend greatly on the Kura-Araks Basin. They proposed to jointly monitor Kura-Araks Basin surface water quality and obtained funding to do so from the North Atlantic Treaty Organization's Science for Peace Programme. Thus, the South Caucasus River Monitoring Project was born in late 2002. The South Caucasus River Monitoring Project formally ended in December 2009, and was a model of collaboration and cooperation in a region where such traits have at times been in short supply. Not only were valuable data collected, but collegial professional relationships also were forged among the participants. In the long run, this latter aspect will likely prove to be the most important product, not just for the South Caucasus, but for others as well.

Keywords: *South Caucasus, water*

"People are willing to do horrible things to each other. What they seem not willing to do is turn off each other's water." – Aaron T. Wolf

The South Caucasus region is comprised of Georgia, Armenia, and Azerbaijan. The region is bordered by the Black Sea to the west, the Caspian Sea to the east, the Caucasus Mountains and Russia to the north, and Turkey and Iran to the south (Figure 1). The three countries have a total population of about 16 million, with Azerbaijan comprising almost 50 percent of the total (Table 1).

The three countries gained their independence from the USSR in 1991. After the USSR was dismantled, industrial production, which was very well established in the 1970's and 1980's, sharply declined in the region because of the energy crisis and the dissolution of economic ties among the former Soviet Republics. In the ten years following the USSR's demise, gross domestic product decreased by about 50 percent, poverty levels reached 60 percent, and unemployment skyrocketed (Swedish International Development Cooperation Agency 2002). On top of these problems the region was faced with environmental degradation stemming from agriculture and industry during the Soviet era.

The Kura-Araks (sometimes spelled "Aras"or "Arax") Basin is the major river system in the South Caucasus. Both rivers rise in Turkey and flow into the Caspian Sea after joining in Azerbaijan. Of the total 188,200 km^2 basin area, almost two-thirds, or about 122,200 km^2, are in the three South Caucasus countries; the remaining basin area is in Turkey and Iran. The Kura-Araks is one of the "new" transboundary river systems of the former "Second World" whose problems are largely unknown to the West (Van Harten 2002).

The water users in all three countries are faced with water quality and quantity problems. In general terms, Georgia has an oversupply of water, Armenia has some shortages based on poor management, and Azerbaijan has a lack of water (Technical Assistance to Commonwealth of Independent States 2003). The main use of Kura-Araks water in Georgia is agriculture, and in Armenia, it is agriculture and industry. In Azerbaijan, the Kura-Araks

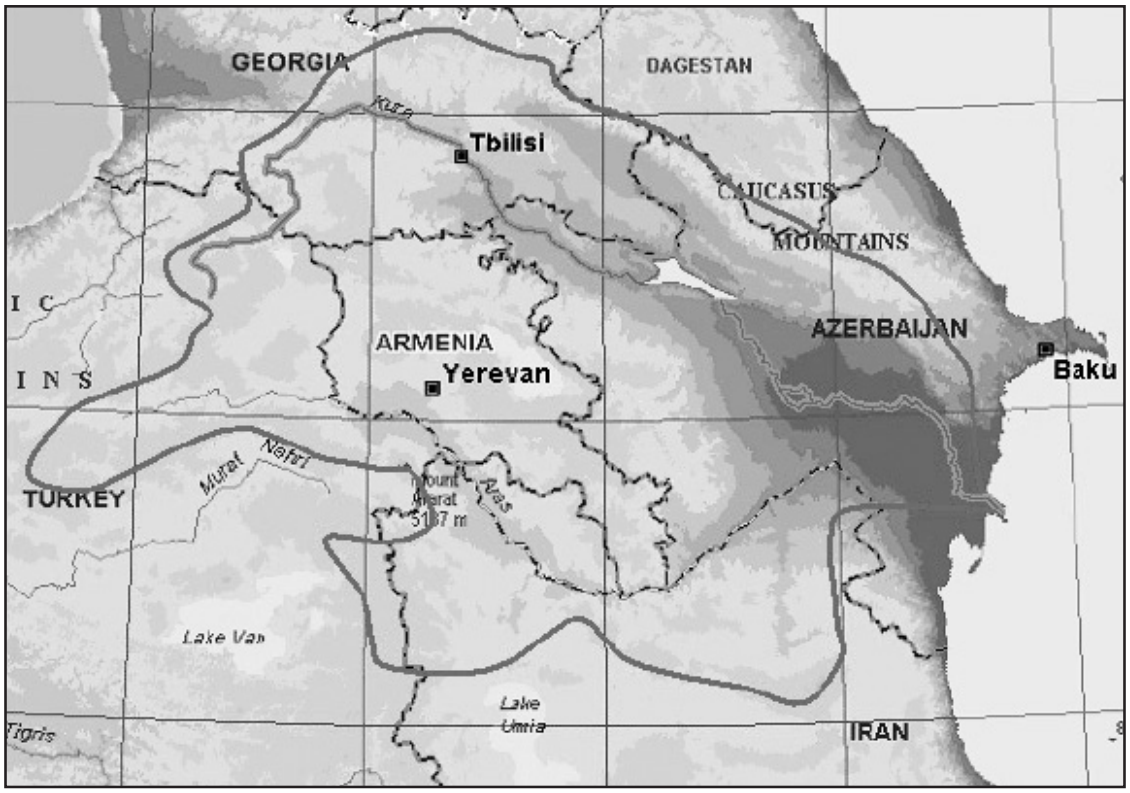

Figure 1. Map of South Caucasus with the Kura-Araks basin outlined in solid line (from Vener 2006).

Table 1. Watershed area of the Kura and Araks Rivers in each country of the South Caucasus (Technical Assistance to Commonwealth of Independent States 2003; USAID 2002; U.S. Central Intelligence Agency 2004; Vener 2006).

Country	Population (millions) (July 2003 est)	Kura River		Araks River	
		% of total basin area	Area (km^2)	% of total basin area	Area (km^2)
Armenia	3.3	15.79	29,741	22	22,090
Azerbaijan	7.8	30.70	57,800	18	18,000
Georgia	4.9	18.43	34,700	-	-
Turkey & Iran	-	35.06	66,000	60	61,000
Total	16.0	100.00	188,241	100	101,090

River water is their primary source of fresh water as well as drinking water. Almost 80 percent of the countries' wastewater loads are discharged into the surface waters of the Kura-Araks Basin (United Nations Economic Committee for Europe 2003). The basin is excessively polluted due to a lack of treatment for urban wastewater and agricultural return flows, pesticides such as DDT that are used in Azerbaijan, and the resurgence of chemical and metallurgical industries in Georgia and Armenia (Technical Assistance to Commonwealth of Independent States 2002).

Water Resources of the South Caucasus and the Kura-Araks Basin

The Kura-Araks Basin is situated south of the Caucasus Mountains. Its borders are northeastern Turkey, central and eastern Georgia, and northwestern Iran. It contains almost all of Azerbaijan and all of Armenia (Figure 1).

Table 2. Land use in the Kura-Araks Basin (km^2), (Joint River management Programme of Technical Assistance to Commonwealth of Independent States 2003; U.S. Central Intelligence Agency 2004; Vener 2006).

State	Land Area	Disputed Area	Forested Area	Agriculture			
				Arable Land		Meadow/ Pasture	Other
				JRMP	USCIA		
Armenia	29,800	1,500	4,250	5,600	5,215	8,300	10,091
Azerbaijan	86,600	2,000	7,590	15,290	16,714	20,936	12,000
Georgia	67,700	600	10,900	7,700	7,813	NA	NA

The Kura River originates in northern Turkey, flows through Georgia and Azerbaijan, and then directly discharges into the Caspian Sea. The Kura River's total length is about 1,515 kilometers and average discharge at its mouth is 575 million cubic meters per year (MCM/yr) (CEO 2002).

The Araks River originates in Turkey and after 300 km forms part of the international borders between Armenia and Turkey, for a very short distance between Azerbaijan and Turkey, between Armenia and Iran, and between Azerbaijan and Iran. The Araks River joins the Kura River in Azerbaijan (Technical Assistance to Commonwealth of Independent States 2003). It is about 1,072 km long and has an average discharge of 210 MCM/yr.

Table 1 shows the distribution of watershed area by country. Table 2 shows land use in the region. Table 3 shows that water resources are not distributed equally in the South Caucasus. While Georgia has more water than it needs, Azerbaijan is left with a water deficit; furthermore, its ground water is of poor quality. It obtains 70 percent of its drinking water from the Kura-Araks Rivers. Armenia has a surface water shortage but has a large fresh ground water stock that it uses for drinking water (Technical Assistance to Commonwealth of Independent States 2003). Table 3 shows that the most precipitation and evaporation occurs in Azerbaijan followed by Georgia and Armenia in that order.

Table 3. Kura-Araks Basin average annual water balance (km^3) (Technical Assistance to Commonwealth of Independent States 2003; Vener 2006). Parentheses indicate depletion.

	AR	AZ	GE
Precipitation	18	31	26
Evaporation	(11)	(29)	(13)
River Inflow	1	15	1
River Outflow	(8)	(18)	(12)
Underground Inflow	1	3	1
Underground Outflow	(1)	(2)	(3)

Water is used for municipal, industrial, agricultural, irrigation, fishery, recreation, and transportation purposes. The main water use is agriculture, followed by industry and household uses. Table 2 shows that Azerbaijan has the most arable land followed by Georgia and Armenia. Even though Azerbaijan has the most arable land, it is the one facing a water deficit.

Azerbaijan withdraws 57.9 percent of its actual renewable water resources, Armenia withdraws 28.2 percent, whereas Georgia withdraws only 5.2 percent. However, as a water resources-rich country Georgia's withdrawal per capita is 635 m^3 while Azerbaijan's is 2,151 m^3, and Armenia's is 784 m^3. It is evident that per capita water withdrawal is disproportionate to water availability among the three countries (Vener 2006). The main rivers have only two reservoirs but the tributaries have more than 130 major reservoirs. The total capacity of the reservoirs and ponds is almost 13,100 MCM (Technical Assistance to Commonwealth of Independent States 2003). With respect to storm water and sewage effluent discharges, the Kura-Araks receives 100 percent of Armenia's, 60 percent of Georgia's, and 50 percent of Azerbaijan's.

Political, Social, and Economic Landscape

Introduction

Armenia, Azerbaijan, and Georgia gained their independence from the Union of Soviet Socialist Republics (USSR) in 1991. The South Caucasus states are neither fully democratic nor fully authoritarian states. All three countries attempted

to introduce democratic systems, and held relatively free elections in 1990-1992 (Swedish International Development Cooperation Agency 2002). However, the region reverted to increased authoritarian rule because of the pressures from war, threats of economic collapse, and the countries' inexperience with participatory politics.

A series of ethnic conflicts erupted in Nagorno-Karabakh, Abkhazia, Javakheti, and other regions. Because of these internal and international ethnic conflicts the region has about 1,500,000 refugees and/or Internally Displaced Persons (Internal Displacement Monitoring Centre 2008; Swedish International Development Cooperation Agency 2002). The South Caucasus region remains in turmoil because of ethnic conflicts, poor economies, environmental degradation, and political instability. In addition, Russia and Georgia engaged in a brief conflict over South Ossetia in August 2008.

Of the three countries, Georgia has made the greatest progress towards building a democratic polity. Azerbaijan and Armenia are still in somewhat of a transition period from authoritarian regimes to full democracies; Azerbaijan in particular is more authoritarian than the other two. Political violence was once a constant threat in the three countries; all experienced coups d'état, insurrections, or attempts to assassinate political leaders in the decade following independence (Swedish International Development Cooperation Agency 2002). As a result, political and socio-economic reform processes in all three countries were slow and suffered setbacks. Widespread corruption, bureaucratic difficulties, and political instability cemented the South Caucasus' reputation as a relatively high-risk area for business in the decade following independence (Swedish International Development Cooperation Agency 2002; U.S. Department of State 2003).

However, the senior author has noted changes that have occurred in the region since he started traveling there in 2002. All three countries' economies have improved, led by Azerbaijan with its oil and gas revenues. All are more stable than the pre-2003 period. Azerbaijan even hosted the 2012 Eurovision Song Contest, and staged a lavish affair designed to showcase its economic progress.

Hydropolitics

During the Soviet era, each country was within the USSR sphere and water resources management of the basin was contingent upon the policy promulgated by the USSR. When they became independent states, the three countries had neither water resources management regulations nor water codes. However, each country has adopted a water code since 1992: Armenia in 1992 and revised in 2002 according to the European Union Water Framework Directives; and Georgia and Azerbaijan in 1997. Nevertheless, there is no uniform control and/or management system for the rivers and, in the post-Soviet period, no water quality monitoring by the riparian countries since 2002.

While the three countries are willing to cooperate on water-related issues, they have not solved their political, economic, and social issues. There are currently no water treaties among the three countries, a condition directly related to the political situation in the region. There is recognition of the importance of integrated water resources management, which provides the countries with a good foundation for a transboundary water management agreement (Vener and Campana 2010).

There are political issues which make agreements difficult among the countries. Nagorno-Karabakh is one of the main obstacles, making it difficult for Azerbaijan and Armenia to sign a treaty even though it may relate only to water resources management (Vener and Campana 2010). The Nagorno-Karabakh region is predominantly an Armenian-populated area in western Azerbaijan. Armenia supports ethnic Armenian secessionists in Nagorno-Karabakh and militarily occupies Nagorno-Karabakh, 16 percent of Azerbaijan's land area. After the occupation, more than 800,000 Azerbaijanis were forced to leave the occupied lands; another estimated 230,000 ethnic Armenians were forced to leave their homes in Azerbaijan and flee into Armenia (U.S. Central Intelligence Agency 2004; U.S. Department of State 2003). A cease-fire between Armenia and Azerbaijan was signed in May 1994 and has held without major violations ever since. The Minsk Group, part of Organization for Security and Co-operation in Europe, continues to mediate disputes.

Another obstacle is the Javakheti region of Georgia. Javakheti is an area that is part of Georgia bordering Turkey, and has a total population of 100,000 people. Almost 90 percent of the population is Armenian. Thus, Javakheti is often cited as a secessionist region (National Intelligence Council 2000). The region is more integrated with Armenia than Georgia and the former supports demands for local autonomy.

European Union - South Caucasus Relationship

Even though a form of cooperation existed between the European Union (EU) and the three republics prior to 1999, it was based mostly on financial and technical assistance. Indeed, after the South Caucasus countries achieved independence in 1991, the EU devoted over 1 billion euros of European Commission assistance to the region (EU-SC 2004).

The relationship between the EU and the South Caucasus is legally conducted within the framework of the Partnership and Cooperation Agreements. These agreements between the South Caucasus states and the EU were signed on April 22, 1996 in Luxembourg and entered into force on July 1, 1999 (EU Parliament 2001). The EU strategy was based on bilateral Partnership and Cooperation Agreements that encourage regional cooperation through the Technical Assistance to Commonwealth of Independent States and Transport Corridor Europe Caucasus Asia projects. Technical Assistance to Commonwealth of Independent States was the most comprehensive project related to the South Caucasus.

In 1999, the EU developed the Luxembourg Declaration to encourage a more intense and opportunist policy toward the South Caucasus. In truth, the Partnership and Cooperation Agreements had not worked as planned and the EU felt disturbed over Russia's "divide and rule" policy towards the South Caucasus, which contributed to the stalemate over ethnic conflicts in the region (Vener 2006). As a result, the EU declared in the Luxembourg Declaration that the increasing instability in the South and North Caucasus States threatened the EU's security. The EU also stated in the Luxembourg Declaration that it would not provide assistance to support the status quo unless there was evidence of positive change (Western European Union Council of Ministers 1999). The EU also declared that they were ready to enhance their contribution to conflict prevention and post-conflict rehabilitation through the Organization for Security and Co-operation in Europe and the UN, as well as promote regional cooperation through the Technical Assistance to Commonwealth of Independent States Program and the Regional Environmental Center for the Caucasus (Technical Assistance to Commonwealth of Independent States 2002).

In addition to the EU's security concerns, as reflected in the Luxembourg Declaration, there are many reasons for the EU's policy changes in the region (Vener 2006):

1. The EU is welcoming new members which would expand its boundaries close to the South Caucasus;
2. Energy resources are important to the gas-hungry European states;
3. The potential energy market in the region is important for the European companies; and
4. The Caucasus states are transit routes for drugs and illegal goods, which indirectly affect the EU.

From the viewpoint of the South Caucasus countries, the EU is important for three reasons (Vener 2006):

1. They all want to join the EU and be part of the balance of power in the region instead of being isolated or threatened by other powers in the region like Russia, Iran, and Turkey;
2. The assistance from the EU is both financially and technically important, and they do not want to lose it; and
3. The EU is an important market for the South Caucasus countries.

Ultimately, the EU is the path that will lead the South Caucasus states to a prosperous future from almost every perspective. For this reason, Armenia, Azerbaijan, and Georgia have become members of the Council of Europe.

The 2008 Russian invasion of Georgia showed that some in the region were right about their concerns regarding Russia and that they needed to

be a part of the EU in order to avoid these kinds of conflicts (Vener and Campana 2010). Russia also recognizes the independence of Abkhazia, an autonomous region bordering the Black Sea in the northwest part of Georgia.

Rationale: The NATO Science for Peace Programme Report

The previous section indicated the importance of EU – South Caucasus relations and the strategic importance of the latter to the former. But the North Atlantic Treaty Organization (NATO) is a security organization; why would it fund a project related to water quality, especially involving countries that are not part of NATO? The senior author served as the NATO project director and was involved almost from its inception. The following discussion is based upon his participation at various meetings, especially during the early stages of NATO's South Caucasus River Monitoring Project, and visits to the South Caucasus countries.

The South Caucasus River Monitoring Project, in existence from 2002 through 2009, was funded at the cost of 1.2 million euros under the auspices of NATO's now-defunct Science for Peace Programme (SfPP) with some funding through the Organization for Security and Co-operation in Europe. The SfPP was established primarily to fund scientists, technicians, and engineers (especially those formerly engaged in defense work) in former Soviet republics or Eastern Bloc countries. The SfPP's project emphasis generally focused on those with an economic orientation (i.e., projects that focused on the development of a process or product that could be marketed). By encouraging the production of a marketable commodity the SfPP sought to improve the economy of a particular country and provide an income stream to former Soviet and Eastern Bloc defense workers. This was done so that they might be less inclined to sell their services to countries or organizations whose interests were inimical to the NATO countries and its allies. But the SfPP also considered "environmental" projects in which there were no recognizable economic payoff, or projects that might foster peace in a region considered strategically important by NATO. Such was the case in the South Caucasus River Monitoring Project, the first environmental SfPP project.

The location of the South Caucasus was a key factor influencing SfPP funding. The South Caucasus lies on the ancient Silk Road trade route and the region acts as a natural bridge between Europe and Asia, and is surrounded by three regional powers: Russia, Iran, and Turkey. It has a favorable geographic location at the crossroads of Asia, Europe, and the Middle East. It is just across the Caspian Sea from Central Asia and "the Stans," former fellow Soviet republics Tajikistan, Kyrgyzstan, Turkmenistan, Uzbekistan, and Kazakhstan. The latter three countries, as well as Azerbaijan, have substantial amounts of natural gas, among other important natural resources.

The location of the region is one of the reasons Europe and much of the international community began to realize the geopolitical and geoeconomic importance of the South Caucasus in the world (Swedish International Development Cooperation Agency 2002). Thus, the three states were eager to develop east–west and north–south transport corridors through their territory, such as the recent Baku–Tbilisi–Ceyhan oil and Baku-Tbilisi-Erzurum gas pipelines, both of which originate in or near Baku, Azerbaijan, and terminate at the Turkish Mediterranean port of Ceyhan (Baku–Tbilisi–Ceyhan) or the interior city of Erzurum (Baku-Tbilisi-Erzurum), where it is supposed to connect to the Nabucco pipeline (Ivanova 2009) to transport natural gas to Europe. In other words, restoration of the ancient Silk Road may help restore the socioeconomic and political stability to the region (Swedish International Development Cooperation Agency 2002).

Azerbaijan is especially aggressive in developing the Silk Road concept; the senior author was introduced to this concept on a visit to Baku in 2009; (see also Ivanova 2009). Unlike its neighbors Georgia and Armenia, Azerbaijan has substantial hydrocarbon resources, especially in its portion of the Caspian Sea reservoir. Foreign countries and companies are investing in Azerbaijan, which has its own oil and gas revenues. It is developing a new oil-gas-shipping terminal on the Caspian Sea and is actively promoting an undersea pipeline to obtain Turkmenistan's, and possibly Kazakhstan's, natural gas for its Baku-Tbilisi- Erzurum pipeline. Such a gas pipeline to Europe would compete with Russian pipelines

and minimize Russia's ability to hold European customers hostage, especially during the winter months. It should be noted that as of this writing, the discovery of shale gas deposits in Europe could be a proverbial "game changer" with respect to the current and future gas suppliers to Europe (Gas Strategies 2010; Wright 2012). Extensive shale gas development in Europe could interfere with Azerbaijan's effort to become a natural gas hub, linking its Caspian Sea deposits and those of Central Asia to Europe.

NATO and the Organization for Security and Co-operation in Europe were anxious to have political stability in the South Caucasus to:

1. Protect access to natural gas and other resources, not only in the South Caucasus but also in Central Asia;
2. Thwart Russian hegemony; and
3. Prevent violence from spilling over into adjacent areas.

Therefore, it was in NATO's best interests to encourage cooperation and harmony among the three countries, and the South Caucasus River Monitoring Project, brought to them from the countries themselves, afforded a means to promote those characteristics. It would do NATO no good to have the South Caucasus countries fighting over water, and if they could work together on water issues, perhaps other contentious issues could also be resolved.

In some ways the NATO and the Organization for Security and Co-operation in Europe's interest in the South Caucasus was a new version of the Great Game, with Russia and the West jockeying for primacy in a region (Ivanova 2009). In the old version, Russia and Great Britain each sought primacy in Central Asia.

One last item is worth noting. Neither the Azerbaijan nor Armenian government was keen on cooperating with the other. Each country's government might have been hard-pressed to explain to its citizens why it was cooperating with its sworn enemy. In fact, one condition for project approval was the deletion of the word "cooperative" from the project title, thus changing the South Caucasus Cooperative River Monitoring Project to the South Caucasus River Monitoring Project. Each of the three countries agreed to approve the South Caucasus River Monitoring Project as long as the project kept a fairly low profile. The ministries were not directly involved in the implementation of the project; the operative organizations were Tbilisi State University in Georgia and subunits of the national academies of science in Azerbaijan and Armenia.

Project Description

Initial Phase

The goal of the South Caucasus River Monitoring Project was to foster collaboration and cooperation among the three countries so as to promote the peaceful resolution of not only water resources issues, but all issues. As the senior author was fond of saying, the project was to promote the "upward diffusion" of harmony and collaboration through each government's hierarchy. By encouraging the countries to work together on water resources, perhaps other issues could be addressed in a similar fashion. Doing so would promote stability in the region.

The project's goal was to establish the social and technical infrastructure for international, cooperative transboundary river water quality and quantity monitoring, data sharing, and watershed management among the Republics of Armenia, Azerbaijan, and Georgia. Its objectives were to (Campana et al. 2008):

- Increase technical capabilities including analytical chemistry and its application to water resources sampling and monitoring, database management, and communications, among the partner countries;
- Cooperatively establish standardized common sampling, analytical, and data management techniques for all partner countries and implement standards for good laboratory practice, quality assurance and quality control;
- Establish database management, GIS, and model-sharing systems accessible to all partners via the WWW;
- Establish a social framework (i.e., annual international meetings) for integrated water resources management; and
- Involve stakeholders.

Monthly monitoring was conducted for water quantity (discharge) and water quality parameters at ten locations in each country. Water quality monitoring consisted of the usual basic parameters (major and minor ions, pH, etc.) plus selected heavy metals, radionuclides, and Persistent Organic Pollutants.

Most of the money was spent on analytical, computational, and sampling equipment. Identical field and laboratory equipment was purchased for each country. Sampling and analytical protocols were agreed upon by all parties. The protocols and identical equipment helped minimize complaints from any of the riparians about someone else's erroneous data.

The group held a meeting at least once per year to discuss current work, equipment needs, planned work, and to present results. The meetings were held in Tbilisi, Georgia, since the political situation between Armenia and Azerbaijan made Tbilisi the most convenient venue.

Data were posted on the project website, maintained by Azerbaijan. Posting ensured that all had access to all the data; the site was not password-protected. The website is no longer operational and data are no longer online and are now with each country. The senior author also has some of the data.

These data were to be used to construct a simple dynamic simulation model of the watershed, which would ultimately form the basis for a more sophisticated river basin management model. The dynamic simulation model itself could be used as the basis for a "shared vision planning" or "mediated modeling" (Van den Belt 2004) approach to conflict management and the development of a treaty or compact to manage the system. To that end, a two-day workshop on dynamic simulation modeling, conducted by one of the senior author's graduate students, was held during the October 2005 annual meeting in Tbilisi. Unfortunately, the project never reached the point where basin-scale modeling, not contractually required, was feasible.

Final Phase and the Future

The South Caucasus River Monitoring Project formally ended in December 2009, although all involved were anxious to continue monitoring. To our knowledge, only Azerbaijan is continuing to monitor because it has the funds, and the incentive – it is the downstream riparian.

The project was a model of collaboration and cooperation in a region where such traits have at times been in short supply. Not only were valuable data collected, but collegial professional relationships also were established among the participants. In the long run, this latter aspect will likely prove to be the more important product.

The region could benefit from an expanded project to address the following:

- Ground water. The South Caucasus River Monitoring Project did not explicitly consider the presence of ground water, an important source of water and intimately connected to streamflow. The countries were not particularly anxious to consider ground water. In fairness to all countries, lack of enthusiasm was likely motivated by the lack of resources necessary to include ground water.
- Develop requirements for environmental flows and ecosystems needs.
- Public health monitoring. Ewing (2003) cited the concern over public health related issues (e.g., waterborne diseases, pathogenic organisms), since much untreated sewage is discharged directly into the waters of the Kura-Araks basin. She also designed a surface water monitoring plan that could be used as a template for public health monitoring.
- Involve Turkey and Iran, the other two riparians. Note that about one-third of the basin is outside the South Caucasus and both rivers originate in Turkey. Why were these countries omitted? Neither was eligible for SfPP funding; Turkey because it was a NATO country and Iran because it was not a former Eastern Bloc country or Soviet republic. Informal collaboration was not encouraged.
- Develop an international agreement. This would provide a framework for joint integrated management of the Kura-Araks basin: surface water, transboundary ground water, water quality, and ecosystem health.

The project could also serve as a template for other regions, such as Central Asia. The senior author was invited to make just such a presentation at a meeting in Tajikistan in 2010 but was unable to attend.

Reflections

After the dissolution of the Soviet Union the Kura-Araks basin became a transboundary basin with respect to the former Soviet republics of Armenia, Azerbaijan, and Georgia. No formal water allocation agreement existed, little water quality monitoring had occurred since the republics became independent, and no mechanisms had been devised to manage the waters of the basin. These countries occupy a region of great strategic importance to the EU and its allies, and stability is paramount. To encourage cooperation on technical issues and mitigate potential conflicts that might threaten their security, NATO and the Organization for Security and Co-operation in Europe funded a bottom-up project enabling all three riparians to monitor surface water quality and quantity on a monthly basis and post data on a transparent website maintained by Azerbaijan. The data could be used to develop a dynamic simulation model of the basin, which could form the basis for a "mediated modeling" approach to the creation of a basin treaty. Although the current project was a much-needed first step, more work must be done, especially with respect to the inclusion of ground water, ecosystem needs, and public health monitoring.

Political differences among the countries, especially the Nagorno-Karabakh issue between Armenia and Azerbaijan, must be resolved before a meaningful agreement among all three countries regarding water allocation, quality, and ecosystem requirements can be developed and implemented (Vener 2006). Any such agreement must also consider Turkey and Iran, the other two riparians in the basin.

Will stability flourish in the South Caucasus? Only time will tell if cooperation over water resources will effect lasting peace, but the South Caucasus River Monitoring Project has provided a strong basis.

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