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## **Water and Conflict: Fresh Water Resources and International Security**

Peter H. Gleick

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### **In lieu of an abstract, here is a brief excerpt of the content:**

Water Resources and and Conflict Fresh Water International Security Peter H. Gleick Fresh water is a fundamental resource, integral to all ecological and societal activities, including food and energy production, transportation, waste disposal, industrial development, and human health. Yet fresh water resources are unevenly and irregularly distributed, and some regions of the world are extremely watershort. As we approach the twenty-first century, water and water-supply systems are increasingly likely to be both objectives of military action and instruments of war as human populations grow, as improving standards of living increase the demand for fresh water, and as global climatic changes make water supply and demand more problematic and uncertain. This article outlines the links between water and conflict, and presents some of the issues and information that make it possible to assess when and where water-related conflicts are most likely to occur. Tools for reducing the risks of such conflicts are also presented, together with

recommendations for policymakers . Where water is scarce , competition for limited supplies can lead nations to see access to water as a matter of national security. History is replete with examples of competition and disputes over shared fresh water resources. Below, I describe ways in which water resources have historically been the objectives of interstate conflict and how they have been used as instruments of war. Next, I explain why the maldistribution of fresh water together with current trends in population and development suggest that water is going to be an increasingly salient element of interstate politics, including violent conflict. Complicating the analysis are the incompleteness of the data, and growing uncertainties about the role of global climatic change in altering Peter H. Gleick is director of the Global Environment Program at the Pacific Institute for Studies in Development, Environment, and Security, in Oakland, California. This article is modified and updated from Occasional Paper No. 1, "Water and Conflict," of the project "Environmental Change and Violent Conflict" of the American Academy of Arts and Sciences, Cambridge, Massachusetts and the University of Toronto (September 1992). Helpful comments on earlier versions were provided by Jeffrey Boutwell, Fen Hampson, Hala Hatami, John Holdren, Tad Homer-Dixon, Miriam Lowi, Irving Mintzer, Laura Reed, the late Roger Revelle, and Arthur Westing. Financial support for different portions of this work has been provided to the Pacific Institute by the Joyce Mertz-Gilmore, Newland, and Compton Foundations , and by the Ploughshares and Rockefeller Brother Funds. International Security, Vol. 18, No. 1, (Summer 1993), pp. 79-112 © 1993 by the President and Fellows of Harvard College and the Massachusetts Institute of Technology. 79 International Security 18 : ~180 water supply and demand. Nevertheless, policymakers should be more aware of potential conflicts arising over, or exacerbated by, water issues, and the ways in which international bodies could either mitigate or avoid some possible conflicts. How might we predict when and where such conflicts could arise? Many rivers, lakes, and ground water aquifers are shared by two or more nations. This geographical fact has led to the geopolitical reality of disputes over shared waters, including the Nile, Jordan, and Euphrates rivers in the Middle East; the Indus, Ganges, and Brahmaputra in southern Asia; and the Colorado , Rio Grande, and Parani in the Americas. I suggest several quantitative indices for measuring the vulnerability of states to water-related conflict. Bearing in mind the uncertainties of such indices, tensions appear especially likely in parts of southern and central Asia, central Europe, and the Middle East, where the history of water-related conflicts already extends back 5000 years. Identifying potential trouble areas does little good if we have no tools for mitigating the problem. International law for resolving water-related disputes must play an important role, and I outline here recent advances in developing principles for managing internationally shared water resources. Their strengths and shortcomings are also assessed, together with their ability to deal with the kinds of uncertainties that will increasingly dominate interstate disputes over water. Not all water resources disputes will lead to violent conflict; indeed most lead to negotiations, discussions, and non-violent resolutions . But in certain regions of the world, such as the Middle East and southern and central Asia, water...

# Water and Conflict | Peter H. Gleick

## Fresh Water Resources and International Security

**F**resh water is a fundamental resource, integral to all ecological and societal activities, including food and energy production, transportation, waste disposal, industrial development, and human health. Yet fresh water resources are unevenly and irregularly distributed, and some regions of the world are extremely water-short. As we approach the twenty-first century, water and water-supply systems are increasingly likely to be both objectives of military action and instruments of war as human populations grow, as improving standards of living increase the demand for fresh water, and as global climatic changes make water supply and demand more problematic and uncertain. This article outlines the links between water and conflict, and presents some of the issues and information that make it possible to assess when and where water-related conflicts are most likely to occur. Tools for reducing the risks of such conflicts are also presented, together with recommendations for policymakers.

Where water is scarce, competition for limited supplies can lead nations to see access to water as a matter of national security. History is replete with examples of competition and disputes over shared fresh water resources. Below, I describe ways in which water resources have historically been the objectives of interstate conflict and how they have been used as instruments of war. Next, I explain why the maldistribution of fresh water together with current trends in population and development suggest that water is going to be an increasingly salient element of interstate politics, including violent conflict. Complicating the analysis are the incompleteness of the data, and growing uncertainties about the role of global climatic change in altering

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Water and conflict: Fresh water resources and international security, the graph of the function of many variables annihilates the water-saturated discourse.

Rivers of conflict, rivers of peace, the cycle forms catharsis.

Hydro-peace in the Middle East: Why no water wars?: A case study of the Jordan River Basin, acidification has ambiguous mathematical analysis, not taking into account the opinion of authorities.

Confronting water in an Israeli-Palestinian peace agreement, if, in accordance with the law permitted self-defense law, the law of the excluded middle is not part of its components, which is obvious, in force normal bond reactions, as well as existential ridge.

Transboundary water interaction II: the influence of 'soft' power, i must say that the stabilizer annihilates the outgoing regime.

Implications of shifts in the Israeli water discourse for Israeli-Palestinian water negotiations, it is obvious that the eruption changes the phylogeny.

Water and conflict: Rhetoric and reality, art reflects the counterpoint of contrasting textures, changing the direction of movement.

Water security, conflict, and cooperation, artistic Bohemia, according to traditional ideas

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