

## AN ABSTRACT OF THE DISSERTATION OF

Shira B. Yoffe for the degree of Doctor of Philosophy in Geography presented on October 12, 2001.

Title: Basins At Risk: Conflict and Cooperation Over International Freshwater Resources

Abstract approved: \_\_\_\_\_

Aaron T. Wolf

In the policy literature and the popular press, the issues of water and conflict are being raised together with increasing frequency. Geographic, international relations, and environmental security theories speculate on the linkages between geographic features, natural resources, spatial relationships, and war or acute conflict. Little quantitative or global-scale research exists, however, to test these theories regarding the relationship of water to international conflict. Moreover current literature often lacks consideration of water cooperation or spatial variability. The Basins at Risk (BAR) project addressed this gap by empirically identifying historical indicators of international freshwater conflict and cooperation and creating a framework to identify and evaluate international river basins at potential risk for future conflict. To accomplish this task, we created a database of historical incidents of water-related cooperation and conflict across all international river basins from 1948 to 1999, delineated an historical Geographic Information System (GIS) of international river basins and associated countries, derived biophysical, socioeconomic, and geopolitical variables at multiple spatial and temporal scales, and tested these variables against our event data.

We found that international relations over shared freshwater resources were overwhelmingly cooperative. Although conflicts over water occurred, violent conflict was rare and far outweighed by the number of international water agreements. International cooperation over water resources covered a wide range of concerns, including quantity, quality, hydropower, and infrastructure development. Conflict, especially acute conflict, centered on issues of quantity and infrastructure (e.g., dams,

reservoirs). The majority of commonly cited indicators (e.g., climate, water stress, government type, relative power relationships) showed no statistically significant association with international water conflict or cooperation. Rather, the tendency towards conflict was associated with rapid or extreme changes in physical or institutional systems (e.g., the building of large dams or the internationalization of a basin). The propensity for such conflict was mitigated by the presence of institutional mechanisms, such as freshwater treaties. From the results of our analyses, we identify three categories of basins at risk and present a framework for further evaluation of the potential for international water conflict in these basins.

Basins at Risk:  
Conflict and Cooperation Over International Freshwater Resources

by  
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APPROVED:

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Major Professor, representing Geography

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Chair of Department of Geosciences

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Dean of the Graduate School

I understand that my dissertation will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my dissertation to any reader upon request.

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Shira B. Yoffe, Author

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## **DEDICATION**

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