

## In This Issue

### RURAL DEVELOPMENT, ENVIRONMENTAL MANAGEMENT, AND MALARIA

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The emergence of parasites and vectors resistant to anti-malarials and insecticides highlights the challenge of finding a sustainable approach to controlling malaria. **Lindsay and Birley** review approaches to malaria control in Sub-Saharan Africa that minimize the use of drugs and insecticides, arguing that the complementary roles of rural development and environmental management have a critical yet overlooked contribution to make in more effective and long-lasting interventions against malaria. The article notes the challenge and opportunity afforded by linking health impact assessment, environmental management, and development goals, and highlights the potential health gains that are possible through biophysical and social-environmental strategies.

### UNDERSTANDING THE HEALTH PROCESSES OF CHANGING ECOSYSTEMS THROUGH CHRONOTONES

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Ecotones represent changing ecology over spatial areas, and can determine biodiversity and sometimes disease occurrence. However, understanding the influence of ecosystem change on human health requires consideration of both the change between ecosystems or landscape phases and also the process in time during which this change occurs. Since many important epidemiological events occur during the periods of rapid ecosystem change, **Bradley** proposes and defines the term *chronotones*. Precedents in the context of water resource development, deforestation, and pastoral land-use change exemplify where the chronotone concept could not only increase understanding of the

public health significance of ecosystem change but also our ability to predict and mitigate these effects.

### TAKING STOCK OF EXISTING KNOWLEDGE OF CLIMATE AND INFECTIOUS DISEASE IN WEST AFRICA

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Taking stock of relationships between current climate variability and disease in vulnerable areas and populations provides key insights for future climate and health assessments. **Thomson et al.** review 40 years of knowledge regarding the direct influence of seasonal, interannual, or decade-long changes in climate on spatial and temporal disease patterns in West Africa. These precedents and the integration of knowledge about them provide important background to understanding how adaptation strategies to reduce vulnerability to climate change may be better developed in the future.

### PARASITES: SMALL PLAYERS WITH CRUCIAL ROLES IN THE ECOLOGICAL THEATER

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Understanding how pathogens affect communities is straightforward for those pathogens that cause significant mortality or emerging diseases. But what happens when a parasite does not have an obvious clinical impact? In a fascinating review, **Marcogliese** highlights the profound role parasites play behind the scenes by manipulating wildlife population structure. Many parasites depend on more than one host, so environmental changes that subtly impact their hosts may completely alter transmission patterns. By focusing on these patterns, we can use parasites as sentinel species for ecosystem health. In the future, these

charismatic microfauna may become the ultimate arbiters of a healthy ecosystem.

## MAORI CULTURAL HEALTH INDEX FOR RIVERS

In this article indigenous (Maori) understanding of the health of streams in New Zealand is encapsulated in an index, measurable and comparable to Western scientific notions. **Townsend et al.** propose a Maori cultural health index as a means to facilitate the effective participation of Maori in natural resource management while also highlighting the potential for similar indexes to be developed elsewhere in the world. By linking different ways of knowing under an umbrella of ecosystem health, the article identifies a practical approach to respond to the close cultural association between human health and well-being and maintaining the health of the natural environment.

## BIODIVERSITY AND THE CONTROL OF RIVER BLINDNESS IN WEST AFRICA

The case history by **Yaméogo et al.** highlights the relevance of biodiversity to both vector and disease control, rather than conventional studies on biodiversity side effects of disease vector control. Drawing insights from a large scale, highly successful, and intensely studied program to control river blindness (onchocerciasis) in West Africa, the article highlights that the ultimate success of control was based on an understanding of biodiversity, including the biology of the vector. By applying the concept of biodiversity to aquatic-insect disease vectors, the study reveals not only the extent of aquatic biodiversity in African river systems, but

also the biodiversity of vector species and the causative organisms at the molecular level.

## INVOLVING DIVERSE INTERESTS TO ADDRESS CROSS-CUTTING ENVIRONMENT, DEVELOPMENT, AND HEALTH CONCERNS

Explicit attention to modes of governance and institution building is critical to managing the interrelationships between economy, society, environment, and health. These themes are examined by **Halpin** in an Australian case study that involved multiple stakeholders in a process designed to address these interrelated issues in the context of native vegetation management. Insights from the coupling of different types of governance, bargaining, and decision-making processes in the Australian case study highlight important opportunities and obstacles to inclusive and deliberative decision-making processes that can cross sectoral, academic, and community boundaries.

## THREAT OF WEST NILE VIRUS TO HAWAII

West Nile virus (WNV) causes significant human mortality, but is even more lethal to many bird species, particularly those in the family Corvidae. Ornithologists are now beginning to ask the question: Will WNV cause the extinction of endangered American birds? In this issue, **Kilpatrick et al.** analyze the pathways by which West Nile virus might reach Hawaii. Their model suggests that between 7 and 70 WNV-infected mosquitoes will hitch a ride on airplanes each year, threatening the health of Hawaii's people, their endemic birdlife, and their tourist economy.

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