

## *In This Issue*

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### PROTECT YOUR SAP

*Pteropus* bats are apparent natural reservoirs of Nipah virus. In humans, drinking raw date palm sap is a risk factor for Nipah infection, especially in Bangladesh. **Khan et al.** conducted a study to evaluate bats' access to date palm sap. The authors watched the bats through infrared cameras for 20 nights. They were able to identify the bats visiting around the tree and making physical contact with the sap in the sap producing areas. This study confirmed that bats commonly visited date palm trees and physically contacted the sap collected for human consumption, and also links to the Nipah virus transmission in human.

### THINGS WE NEVER HEARD ABOUT CHYTRID

The pathogenic chytrid fungus *Batrachochytrium dendrobatidis* is thought to be responsible for hundreds of amphibian extinctions and declines worldwide. In this study, **Raffel et al.** found widespread infection in red-spotted newt populations, despite no overt evidence of pathology. The authors tested multiple hypothesized drivers of infection within and among populations and found that newts in ponds with more leaf litter and vegetation had higher infection levels. Leaves and vegetation might increase pathogen transmission directly. Alternately, increased shade due to tree cover and vegetation might lower shallow water temperatures and increase susceptibility to infection, which is consistent with previous findings that chytridiomycosis is temperature-dependent.

Another issue addressed by **Kilburn et al.** is whether the pathogen is novel and invasive or enzootic, with the disease triggered by other factors. Using the most sensitive diagnostic procedure available, the authors examined the

prevalence and intensity of infection in extant populations of Panamanian amphibians at differing elevations and stages of epizootic disease. The authors found that the pathogen was present in all the examined populations. The chytrid may be enzootic in Panamá even if the disease, chytridiomycosis, appears novel and invasive.

### CRITICAL THINKING AND VISUAL METHODS

In regards to ecohealth issues, ethics and values become a part of the discussion that cuts across many socio-political contexts. **Wyborn and Cleland** discusses the integration of visual research methods—within a critical systems framework—with case studies related to human and environmental health. The authors contrasted two protected area case studies from two different parts of the world, a coral reef in the Philippines and a national park in Australia. They explored the perceptions of users and managers of the protected areas and what conflicts existed or developed. The visual methods used images and “visible” artifacts, some created by the participants, in conjunction with interviews. This type of approach can be valuable to managers and users of protected areas around the world because it may provide a way to evaluate and reflect on conflicts and relationships.

### THE HEALTH SIDE OF CLIMATE

The relationship of climate change to vector-borne diseases like malaria has been a central but controversial topic in environmental science and policy since the late 1980s. **Brisbois and Ali** analyze this controversy using critical social theory, concluding that climate change is serving to

motivate challenges to disciplinary boundaries, with predictably defensive reactions from career vector-borne disease specialists. While both sides claim to be representing responsible science and the public interest, however, crucial consideration of global health equity represent an as-yet unexplored, but nevertheless crucial dimension to the topic.

## FROM THE AVIAN FRONT LINE

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**McKenzie and Goulet** address whether subsets of bird communities can be predictors of human West Nile Virus (WNV) cases across a region of Colorado that experienced some of the highest numbers of human cases in the US. Their hypothesis tests whether the relative abundance of bird species, which act as amplifiers of the virus, are correlated to human disease cases. The authors found statistically significant support for the abundance of these birds as predictors of human WNV cases in the peak infection years of 2003 and 2007. This finding has important public health implications to improve prediction of WNV epidemics by focusing surveillance efforts on specific subsets of the bird community.

A paper by **Gilbert et al.** presents an integrated analysis of risk factors of Highly Pathogenic Avian Influenza (HPAI) H5N1 in South Asia combined with migration data of satellite-tracked wild waterfowl along the Central Asia flyway in 2009. The study reveals new patterns in the definition of areas at risk within South Asia, and a direct spatio-temporal link between H5N1 hot-spots in India and Bangladesh, and the wild bird outbreaks in May–July 2009 in China (Qinghai Lake), Mongolia, and Russia.

## HEALTH IN CITIES

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As the center of human production and living activities, cities and their health state are very important for regional sustainable development. In their study, **Su et al.** considered the basic roles of urban ecosystem health assessment (i.e., discovering the comprehensive health status, and diagnosing the limiting factors of urban ecosystems). They established a general framework integrating comprehensive evaluation and detailed analysis, from both bottom-up and top-down directions. Emergy synthesis and set pair analysis were applied to fulfill the framework and evaluate the relative health levels of urban ecosystems. The authors also used another analysis to classify the urban ecosystems with

respect to the health status. The resulting framework for urban ecosystem health assessment can serve as a useful tool for diagnosis from a biophysical perspective.

Urban sewage discharge is a worldwide environmental problem that represents a major source of enteric microorganisms to coastal areas. Sewage pollutants tend to accumulate in sediment, becoming a reservoir of enteric microorganisms. **González-Fernández et al.** assessed fecal pollution in marine sediments from an area receiving sewage discharges. Results showed that accumulation of fecal indicators in sediments can spread to a large extent, affecting the whole ecosystem. The authors provide useful information for environmental management by indicating areas more likely to serve as reservoir of pathogens. Further research is necessary to improve monitoring, detection, and correlation with pathogens, thus performing a better risk assessment to human health.

## MALARIAL MATTERS

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Increasing human populations in the western Kenya highlands have led to increased demand for arable land, resulting in the conversion of natural swamps into arable land. Land use change through swamp cultivation has created conditions suitable for the breeding of malaria vectors. Source reduction is typically the most effective and economical of the mosquito control techniques available and may be accomplished by eliminating mosquito breeding sites. **Wamae et al.** employed a strategy to achieve source reduction through manipulation of the breeding habitat and demonstrated clearly how a simple, cheap to use method can alter the densities of malaria vectors.

An entomological survey by **Dutta et al.** reveals that the abundance of *Anopheles baimaii*, a primary vector of malaria in the northeastern region of India, is significantly higher in monsoon season in comparison with pre- and post-monsoon. In regards to habitat preference, the cattle hoofmarks and elephant footprints (turbid) are equally responsible for vector breeding. The government and wildlife conservation teams can restrict deforestation, which is the main cause of increasing elephant passages toward forest fringes, without disturbing the wildlife habitats. This act will certainly help in containment of disease transmission, particularly of malaria, in this region.

All of these studies have shown that environmental conditions play an important role in the transmission of malaria. In a study by **Randell et al.**, the authors assess

current knowledge and practices related to mosquito ecology and environmental management for malaria control in a rural, agricultural region of Tanzania. Results show that respondents are well aware of the links between mosquitoes, the environment, and malaria, and that most perform environmental management to protect themselves from malaria. The authors recommend that further

research should be conducted to determine the effects of different environmental management practices on both mosquito populations and malaria transmission in this region, and that increased participation in effective techniques should be promoted.