

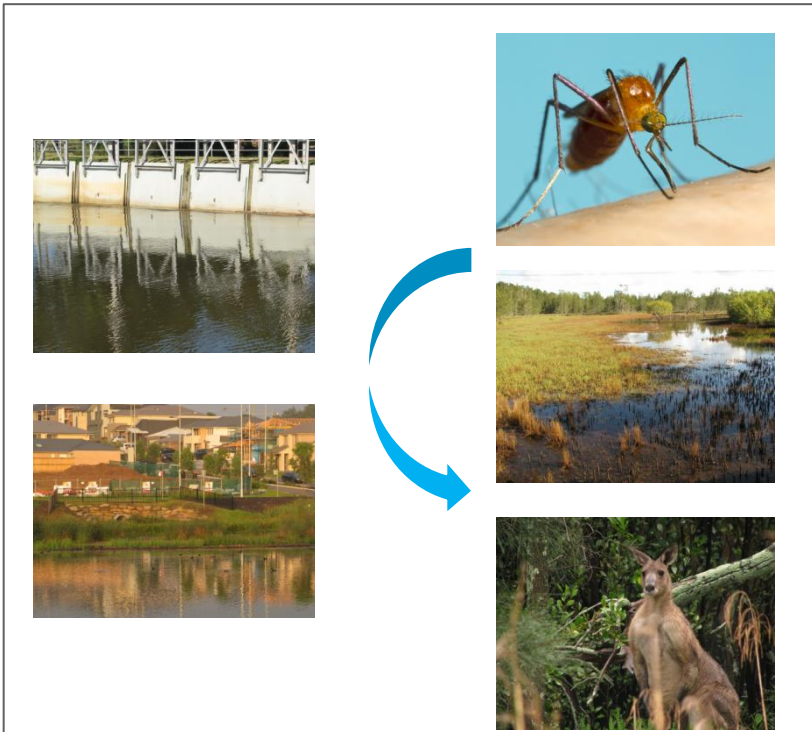
Managing mosquito-borne disease risk in response to weather, wetlands and wildlife in coastal Australia

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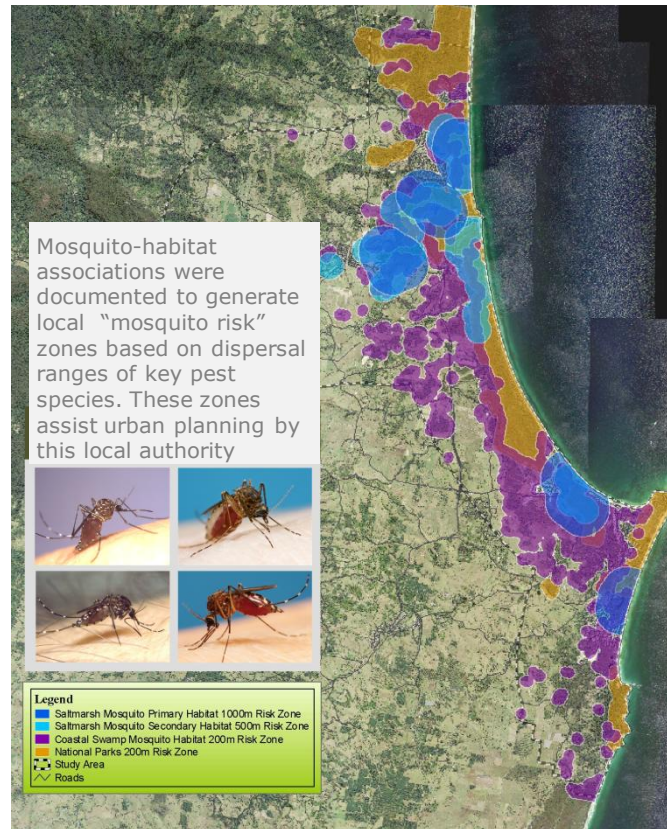
Some background to Ross River virus in Australia

- Ross River virus is a mosquito-borne pathogen that infects ~5000 people each year but there is temporal and spatial variability in infection rates
- While it is not fatal, the symptoms can be severe and debilitating
- Over 40 mosquito species (inc freshwater, estuarine and “backyard” species) may act as vectors of the virus with complex regional environmental drivers of mosquito abundance
- The key reservoir hosts of the virus are kangaroos and wallabies



What drives outbreaks of Ross River virus?

Outbreaks of Ross River virus are often triggered by regionally specific factors including temperature, rainfall and tidal flooding of coastal wetlands. The interaction of rainfall and tides, as well as broader climatic trends such as El Nino, can shift the magnitude of mosquito population diversity and abundance. Variability in the abundance, distribution and immunity of local wildlife can influence the severity of disease epidemics. Urbanisation is increasing the resident human population close to productive mosquito habitats. Large-scale wetland rehabilitation projects are increasing the capacity of local habitats to produce abundant mosquito populations. Notwithstanding the potential influence of a changing climate, local authorities must reconsider their approach to wetland and mosquito management.



Mosquito Aware Urban Design

Local authorities are becoming increasingly aware of rising mosquito-borne disease risk associated with urbanisation of coastal regions. There is a lack of financial and operational capacity to undertake broadscale mosquito control activity. In some regions, environmental protection legislation restricts pesticide use. Land use planning instruments are being used to guide development approvals with strict requirements on rezoning and building requirements close to wetland areas. However, many regions lack site-specific data on locally important pest mosquitoes, their habitats and environmental drivers of abundance.



A. Estuary without wallabies and few virus isolates



B. Estuary with wallabies and more frequent virus isolation

Does wildlife influence activity of Ross River virus?

The abundance of mosquitoes and activity of Ross River virus was compared between two estuaries in Sydney, Australia over a five year period. Wallabies were common throughout one of the estuaries but not the other. The diameter of orange circles is relative to the mean weekly abundance of mosquitoes collected in carbon dioxide baited light traps. Mosquito abundance was similar between the two estuaries. All specimens collected were tested for the presence of Ross River virus. Only 1 isolate was detected from the estuary without wallabies compared to 20 from where wallabies were present. This result has public health implications for the provision of wildlife corridors through new residential developments.