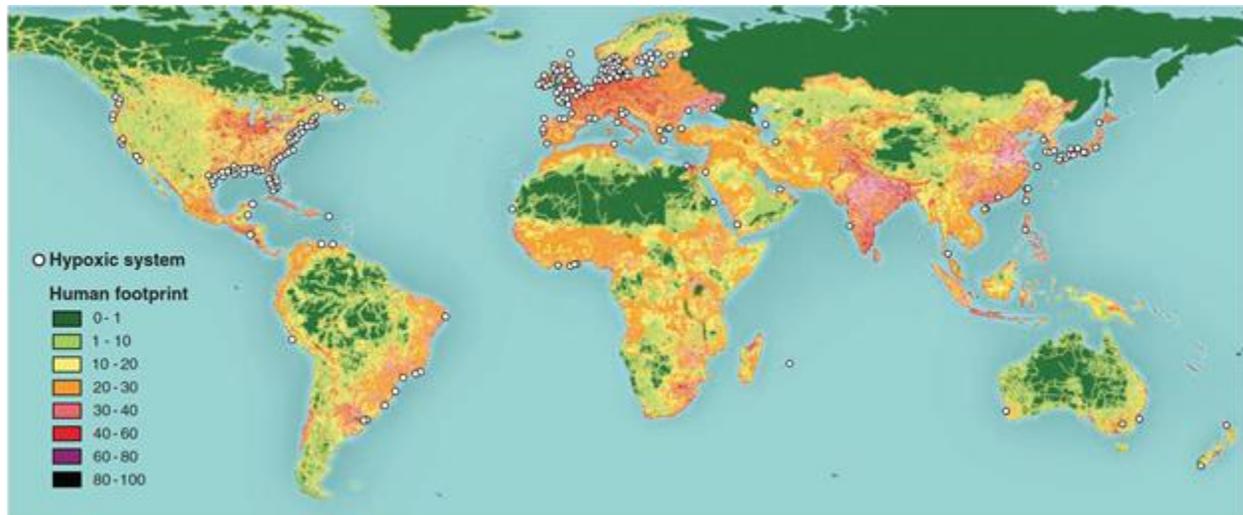




Dead Zones in Coastal Ecosystems



Caption: The map illustrates the severity of our global “human footprint” rated on a scale from 0 to 100. Green areas are the least influenced by humans and black areas are the most heavily influenced. The human footprint index includes measures of population density; land use; light pollution; and the region’s accessibility by roads, railroads, rivers, and coasts. The white dots on the map are hypoxic systems, or dead zones, caused by eutrophication.

BACKGROUND INFORMATION

The number of dead zones in the ocean has approximately doubled every decade since the 1960s. Dead zones, also called hypoxic systems, are areas of coastal systems with low oxygen levels caused by human activity. Dead zones are often caused by eutrophication, a process in which excess nutrients enter a body of water, causing an overgrowth of algae and other plants. As these plants die and decompose, microbes consume dissolved oxygen in the water. The resulting hypoxic conditions, where dissolved oxygen levels fall below 2 ml of O₂/L of water, cause fish and other marine life to abandon their habitats or die. Eutrophication can occur naturally, but it has increasingly been linked to human activities, such as when excess agricultural fertilizers run off the land into waterways that ultimately empty into the ocean. Dead zones upset the ecological balance in coastal oceans and have resulted in losses to the fishing industry in numerous locations around the world. Researchers compiled information on more than 400 hypoxic systems linked to eutrophication that they identified from published reports. Dead zones have only recently begun being reported for the southern hemisphere and Asia, so these may be underrepresented. The researchers overlaid the locations of hypoxic systems on a map of the global “human footprint,” which is an index that was developed based on measures of population density; land use; light pollution; and the region’s accessibility by roads, railroads, rivers, and coasts.