

ENVIRONMENTAL MONITORING AND ASSESSMENT RESEARCH

Developing Tools to Assess the Ecological Condition of the Nation's Aquatic Systems

The Aquatic Monitoring and Bioassessment Branch (AMBB) at the Environmental Protection Agency's Western Ecology Division leads ORD's research on monitoring freshwater aquatic systems. This work is in response to the Clean Water Act (CWA, Section 305b) that requires EPA to report biennially on the status of water quality throughout the United States. This report, prepared in partnership with the states and tribal nations, is intended to provide a statement of the condition of all the nation's waters and trends in those conditions over time. EPA aggregates state and tribal data to create the report for Congress. In addition to describing condition of the waters, the report includes a discussion of the relative importance of the various stresses or causes of degraded water quality. The interpretation of the report has been challenged because each state and tribal nation uses different monitoring methods.

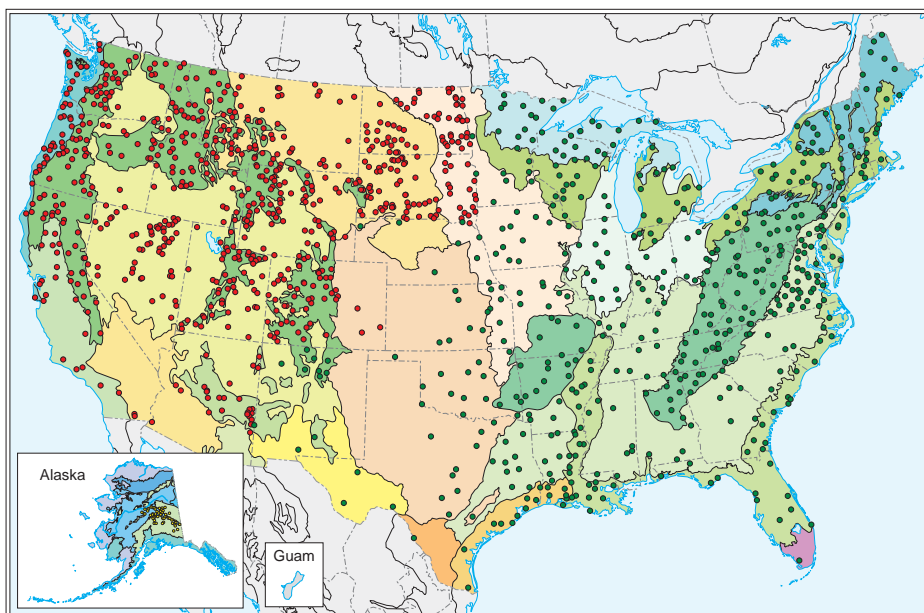
In a unique collaborative effort between EPA's Office of Research and Development (ORD), the Office of Water (OW) and the 10 EPA regional offices, ORD's Environmental Monitoring and Assessment Program (EMAP), of which the AMBB is an integral part, has focused on providing creative and scientifically defensible solutions to this challenge. AMBB develops effective indicators of ecological condition and environmental stressors that are practical enough to be used routinely by the states and tribal nations. AMBB also mounted a critical research focus on survey design — the science behind how one can make statements about the entire aquatic resource by sampling a select subset of sites. These concepts, applied to streams and rivers, have been successfully developed and tested in the Mid-Atlantic states, are now being calibrated for use in the West (EMAP-West).

EMAP-West, begun in 1999, encompasses EPA Regions 8, 9, and 10. As with work in the East, the key to success of

the program has been the adaptation and application of indicators, both biological indicators of condition and chemical, physical, and watershed indicators of stress. Special emphasis is being placed on biological measurements and the process by which the "reference" or "expected" biological conditions are established. Because the natural density of streams/rivers across the West varies greatly as does the accuracy of the maps that depict the extent of these systems, several modifications to the sampling design have been made to accommodate the issue of intermittent streams that occur, particularly in the dry Southwest.



As the agency has increased its emphasis on the Government Performance and Results Act's requirement that programs demonstrate measurable progress, AMBB protocols have been adopted by others. The Office of Water initiated a national Wadeable Stream Assessment (WSA; national sampling locations shown on map) based upon these protocols and is depending upon EMAP-West data from the 12 western states in the program. The WSA national assessment is expected to be available in December 2005. Independently, 25 states have adopted elements of the design and indicator protocols for their individual monitoring programs.



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