

## Effect of ecological group classification schemes on performance of the AMBI benthic index in US coastal waters

David J. Gillett<sup>1,\*</sup>, Stephan B. Weisberg<sup>1</sup>, Treda Grayson<sup>2</sup>, Anna Hamilton<sup>3</sup>, Virginia Hansen<sup>4</sup>, Erik W. Leppo<sup>3</sup>, Marguerite C. Pelletier<sup>5</sup>, Angel Borja<sup>6</sup>, Donald Cadien<sup>7</sup>, Daniel Dauer<sup>8</sup>, Robert Diaz<sup>9</sup>, Margaret Dutch<sup>10</sup>, Jeffrey L. Hyland<sup>11</sup>, Michael Kellogg<sup>12</sup>, Peter F. Larsen<sup>13</sup>, Jeffrey S. Levinton<sup>14</sup>, Roberto Llansó<sup>15</sup>, Lawrence L. Lovel<sup>7</sup>, Paul A. Montagna<sup>16</sup>, Dean Pasko<sup>17</sup>, Charles A. Phillips<sup>18</sup>, Chet Rakocinski<sup>19</sup>, J. Ananda Ranasinghe<sup>1</sup>, Denise M. Sanger<sup>20</sup>, Heliana Teixeira<sup>21</sup>, Robert F. Van Dolah<sup>20</sup>, Ronald G. Velarde<sup>22</sup>, Kathy I. Welch<sup>10</sup>

<sup>1</sup>*Southern California Coastal Water Research Project, Costa Mesa, CA, USA*

<sup>2</sup>*United States Environmental Protection Agency, Office of Water, Washington DC, USA*

<sup>3</sup>*Tetra Tech., Owings Mills, MD, USA*

<sup>4</sup>*USEPA, Gulf Ecology Division, Gulf Breeze, FL, USA*

<sup>5</sup>*USEPA, Atlantic Ecology Division, Narragansett, RI, USA*

<sup>6</sup>*AZTI Tecnalia Marine Research Division, Herrera Kaia Portualdea n/s, Pasaia, Spain*

<sup>7</sup>*Ocean Monitoring Research Group County Sanitation Districts of Los Angeles County, Carson, CA, USA*

<sup>8</sup>*Department of Biological Sciences, Norfolk, VA 23529, USA*

<sup>9</sup>*Virginia Institute of Marine Science, Gloucester Point, VA, USA*

<sup>10</sup>*Washington State Department of Ecology, Olympia, WA, USA*

<sup>11</sup>*NOAA, National Ocean Service, Center for Coastal Environmental Health and Biomolecular Research, Charleston, SC, USA*

<sup>12</sup>*Oceanside Biology Laboratory, San Francisco Public Utilities Commission, San Francisco, CA, USA*

<sup>13</sup>*Bigelow Laboratory for Ocean Sciences, East Boothbay, ME, USA*

<sup>14</sup>*Department of Ecology and Evolution, Stony Brook University, Stony Brook, NY, USA*

<sup>15</sup>*Versar Inc. ESA, Columbia, MD, USA*

<sup>16</sup>*Harte Research Institute, Texas A&M University-Corpus Christi, Corpus Christi, TX, USA*

<sup>17</sup>*Orange County Sanitation District, Fountain Valley, CA, USA*

<sup>18</sup>*Dancing Coyote Environmental, Aliso Viejo, CA, USA*

<sup>19</sup>*The University of Southern Mississippi, Gulf Coast Research Laboratory, Ocean Springs, MS, USA*

<sup>20</sup>*South Carolina Department of Natural Resources, Marine Resources Research Institute, Charleston, SC, USA*

<sup>21</sup>*European Commission, Joint Research Centre (JRC), Institute for Environment and Sustainability (IES), Water Resources Unit, Ispra (VA), Italy*

<sup>22</sup>*City of San Diego, Marine Biology Laboratory, San Diego, CA, USA*

### ABSTRACT

The AZTI Marine Biotic Index (AMBI) requires less geographically-specific calibration than other benthic indices, but has not performed as well in US coastal waters as it has in the European waters for which it was originally developed. Here we examine the extent of improvement in index performance when the Ecological Group (EG) classifications on which AMBI is based are derived using local expertise. Twenty-three US benthic experts developed EG scores for each of three regions in the United States, as well as for the US as a whole. Index performance was then compared using: (1) EG scores specific to a region, (2) national EG scores, (3) national EG scores supplemented with standard international EG scores for taxa that the US experts were not able to make assignments, and (4) standard international EG scores. Performance of each scheme was evaluated by diagnosis of condition at pre-defined good/bad sites, concordance with existing local benthic indices, and independence from natural environmental gradients. The AMBI performed best when using the national EG assignments augmented with standard international EG values. The AMBI using this hybrid EG scheme performed well in differentiating a priori good and bad sites (>80% correct classification rate) and AMBI scores were both concordant and correlated ( $r_s = 0.4-0.7$ ) with those of existing local indices. Nearly all of the results suggest that assigning the EG values in the framework of local biogeographic conditions produced a better-performing version of AMBI. The improved index performance, however, was tempered with

apparent biases in score distribution. The AMBI, regardless of EG scheme, tended to compress ratings away from the extremes and toward the moderate condition and there was a bias with salinity, where high quality sites received increasingly poorer condition scores with decreasing salinity.

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