Table 18.1. Fixed biological indicators described in this chapter, main studies using or describing their use in sea level studies and key points to be considered for each FBI.

<table>
<thead>
<tr>
<th>FBI</th>
<th>Refs</th>
<th>Key points</th>
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</table>
| Vermetidae   | 1, 2, 3, 4, 5, 6, 21          | • Many species of *Dendropoma* and *Petaloconchus* have their upper limit in the midlittoral zone  
• Different kinds of reefs  
• Difference in elevation can be observed for the same reef measured in sheltered and exposed areas. |
| Balanidae    | 7, 8, 21, 22, 24              | • Upper limit begins at MSL  
• Upper limit must be identified along a cliff or a vertical upper surface  
• Used successfully in association with archeological remains  
• Variations of isotopic ratio in brackish waters may cause problems for radiocarbon dating |
| Chthamalidae | 9, 10, 11, 21, 22             | • Vertical living range limited to the splash zone, that is, between the upper midlittoral and lower supralittoral zones  
• Upper limit varies following local conditions of surf exposure, tidal amplitude and topography  
• Fossil population must be compared with the modern population  
• Better accuracies using chthamalids as FBIs have been obtained using fossils in semi-enclosed environments  
• Shells of small size, difficult dating. Possible deposition of calcareous material inside the shells, affecting age determinations |
| Mytilus      | 12                            | • *Mytilus edulis* complex living in midlittoral–upper infralittoral (0–5 m)  
• Preservation in this status is often compromised by the fragility of the byssum  
• Limitations for use in Arctic seas |
| Lithophaga   | 13, 14, 15, 21, 22            | • Living range is from the midlittoral down to deeper than 30 m  
• Upper limit coincides closely with sea level, should be observed along a continuous rock surface  
• Difficult preservation of shells for radiocarbon dating, possible settlement on secondary generations into already-carved boreholes |
| Saccostrea   | 16, 21, 22, 24                | • Ostreidae typically live in shallow water and species of the genera *Saccostrea* and *Crassostrea* may colonize the midlittoral zone, but in general oyster vertical accuracy in indicating SL is variable to species and regions  
• Due to their resistance to variable environmental conditions, they can be used in brackish areas and harbors  
• Require detailed mineralogical analyses before dating to assess shell composition |
| Crassostrea  |                               | • Their reefs are mostly found in enclosed embayments and/or brackish estuaries and lagoons  
• Some genera, such as *Galeolaria*, colonize the midlittoral  
• Growth of serpulids on speleothems has been used to constrain and date marine ingression in several limestone caves |
| Serpulidae   | 17, 18, 23, 24                | • Rims of coralline algae living near the present sea level have been largely used as indicators of ancient sea levels  
• Necessity to clean samples from younger crustations, i.e., borings infilled by younger material, before radiocarbon dating |