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Assessing Global Boundary Stratotype Section and Point (GSSP) candidates for the Anthropocene

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While a potential Anthropocene chronostratigraphical unit has now been preliminarily assessed in overall terms, and suggestions for boundary levels have been made, the task of assessing and selecting potential Global Boundary Stratotype Section and Point (GSSP) candidate sections is only in its early stages. Nevertheless, many sections around the world have been documented that demonstrate encouraging, if so far not comprehensive, sets of data, with demonstrated correlatory power to at least decadal levels. These are sited within a range of sedimentary settings that include polar snow and ice layers (for proxies including radionuclides, $\delta^{18}\text{O}$, CO_2 concentrations and $\delta^{13}\text{C}$, increased dust flux/lead aerosols, annual layers), lakes at various latitudes ($\delta^{15}\text{N}$, microfossils, particulates including fuel ash and plastics, persistent organic pollutants - POPs), tree rings (^{14}C , $\delta^{13}\text{C}$, annual layers), growing peat bogs (fly ash), marine anoxic basins (annual laminites, microfossils, radionuclides, fly ash, microplastics, POPs), speleothems (chemical/isotope patterns), accumulations of anthropogenic material (technofossil stratigraphy) and others. Together these encompass a wide range of proxies and geography, and a number can be independently dated radiometrically (e.g. by ^{210}Pb).

To make progress, a small number of potentially optimally representative sites needs to be selected for preliminary examination, for which more systematic and comprehensive datasets then need to be

obtained, with correlation established between these and other sections. We suggest that, initially, analysis of this kind be focused around the mid-20th century level, although this should not exclude comparable analysis of other potential boundary levels. Such an exercise should help in suggesting a candidate primary GSSP with additional auxiliary reference sections, as with the Holocene GSSP. We note that the possibility of a GSSA boundary, or of some combination of GSSP and GSSA should not be excluded, for precision of boundary location within the human as well as geological calendars. More widely, an exercise of the kind we propose would undoubtedly help illuminate the large and complex global changes associated with the Anthropocene concept.

