

Figure S1: A) Map of the monitored sites in the four distinct habitats along the coast of Brittany (France). B) Sampling method in each habitat: Benthic macrofauna communities (organisms > 1mm) have been monitored yearly since 2003 along coasts of Brittany (France) within the REBENT program (<https://revent.ifremer.fr>). We focused on four habitats: intertidal eelgrass meadows (only *Zostera marina* beds are monitored within the REBENT), intertidal sandy beaches, subtidal maerl beds (principally *Lithothamnion corallioides* and *Phymatolithon calcareum*) and subtidal soft sediments (respectively referred to as intertidal bare habitat (IBAR), intertidal biogenic habitat (IBIO), subtidal bare habitat (SBAR) and subtidal biogenic habitat (SBIO) in the text). At each site three faunal samples were taken at each of three fixed sampling points distributed 200 m apart (0.03 m² cores in the intertidal and 0.1 m² Smith-McIntyre grabs in the subtidal; see Boyé et al., 2019), except for Pierre Noire (12) where up to 10 grabs were taken at the sampling site.

Text S1: Sampling was performed between the end of February and the beginning of May, before the recruitment of most species in the region. In the laboratory, specimens were sorted, counted and identified to the lowest possible taxonomic level (usually species). Since the acquisition and identification of specimens were not carried out by the same people over the years of the monitoring program, we proceeded to a taxonomic homogenization: for each recorded taxon, names were checked thanks to the World Register of Marine Species to ensure a consistent taxonomic resolution and their distribution in time and space was scrutinized by experts in benthic taxonomy. Degradation to higher taxonomic levels was undertaken for doubtful identifications, safeguarding against major misidentification, differences in identification among operators, or changes in time in given taxonomic groups due to updates in the taxonomic literatures. Particular care was taken for rare species and decision on their taxonomic degradation was made according to the robustness of the criteria discriminating the species, the level of expertise needed to discern them, and the likelihood of their presence in the studied area given their known distribution range. We favoured the possibility of underestimating the true diversity over that of keeping potential artificial patterns (see Boyé et al., 2017).

In order to minimize the prevalence – and potential effect – of missing data as much as possible, we only selected sites with complete time series and with at least 3 core or grab samples in any particular year. Samples were pooled to estimate abundances at the site level. In the end, this led to a selection of 32 sites monitored (9 in IBAR, 8 in IBIO, 8 in SBAR and 7 in SBIO) from 2007 to 2019 while keeping a spatial resolution covering the coasts of Brittany and encompassing most of the environmental settings found in this region.

We conducted the analyses within each habitat separately because it may not be relevant to run analyses including two different tidal levels since sampling gears differ between intertidal and subtidal sites.

All data from the REBENT monitoring program (<https://rebent.ifremer.fr>) are available in the Quadrigé database (<https://envlit.ifremer.fr/Quadrigé-la-base-de-donnees>) and in the database of the marine observatory of the IUEM (available upon request: <https://www-iuem.univ-brest.fr/observatoire>).

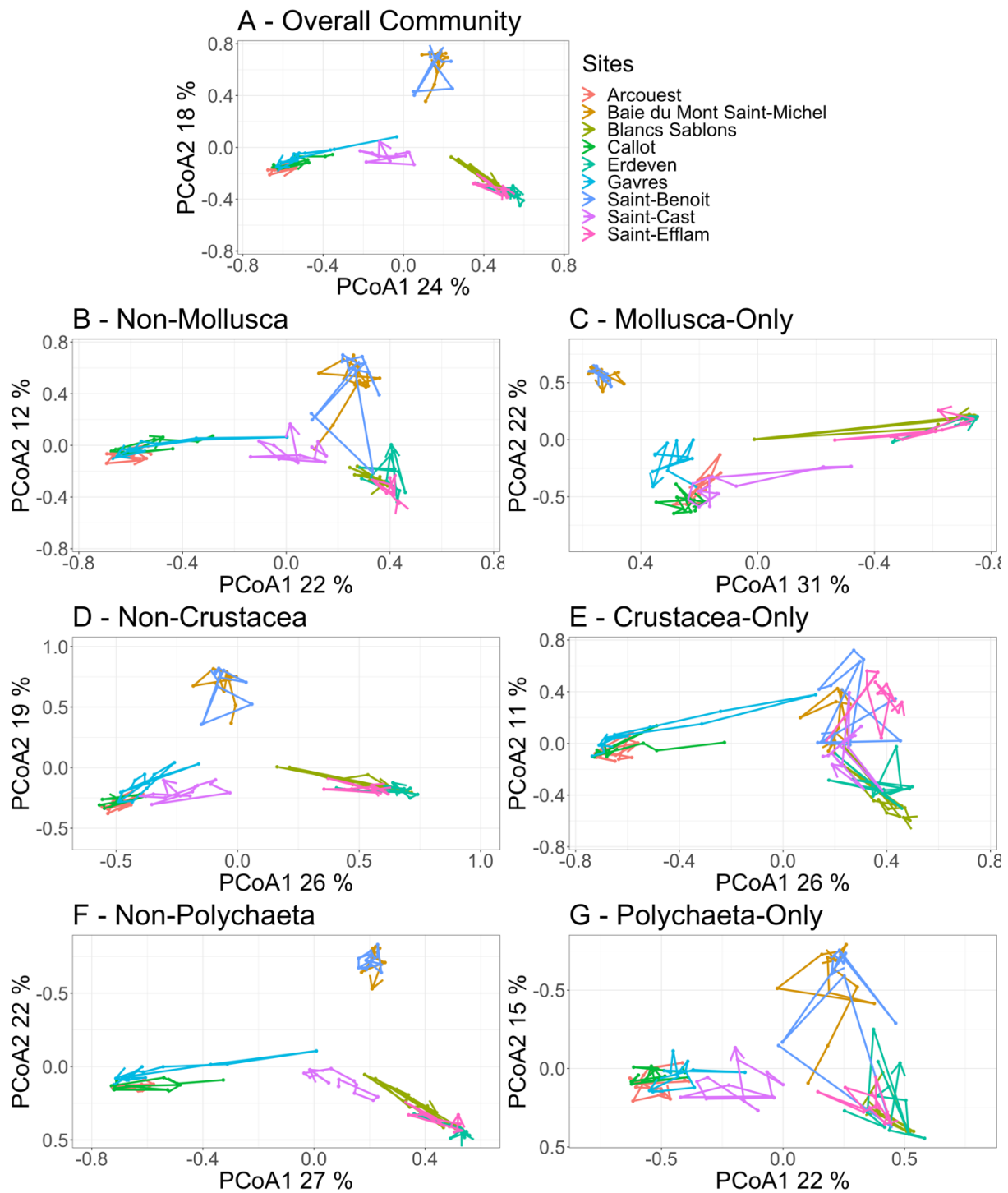


Figure S2: Two-dimensional (PCoA) representation of community trajectories (2007-2019) of the overall community (A), Non-Subset (B, D, F) and Subset-Only (C, E, G) in the intertidal bare habitat. One point represents the community state of a site in a given year (one observation). Site specific consecutive community states are linked by segments which taken together depicts the site trajectory. Arrows represent final community state of a trajectory.

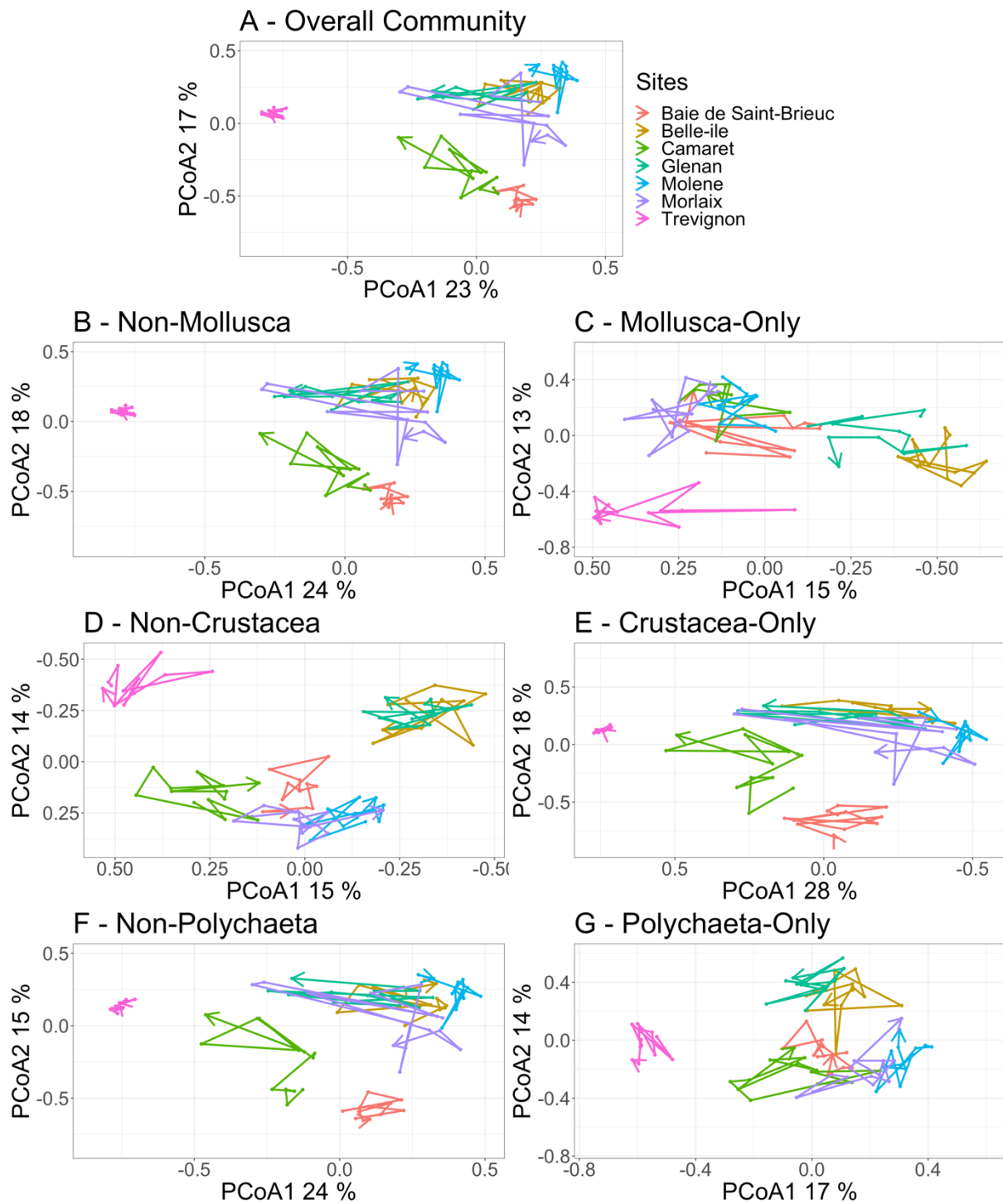


Figure S3: Two-dimensional (PCoA) representation of community trajectories (2007-2019) of the overall community (A), Non-Subset (B, D, F) and Subset-Only (C, E, G) in the subtidal biogenic habitat. One point represents the community state of a site in a given year (one observation). Site specific consecutive community states are linked by segments which taken together depicts the site trajectory. Arrows represent final community state of a trajectory.

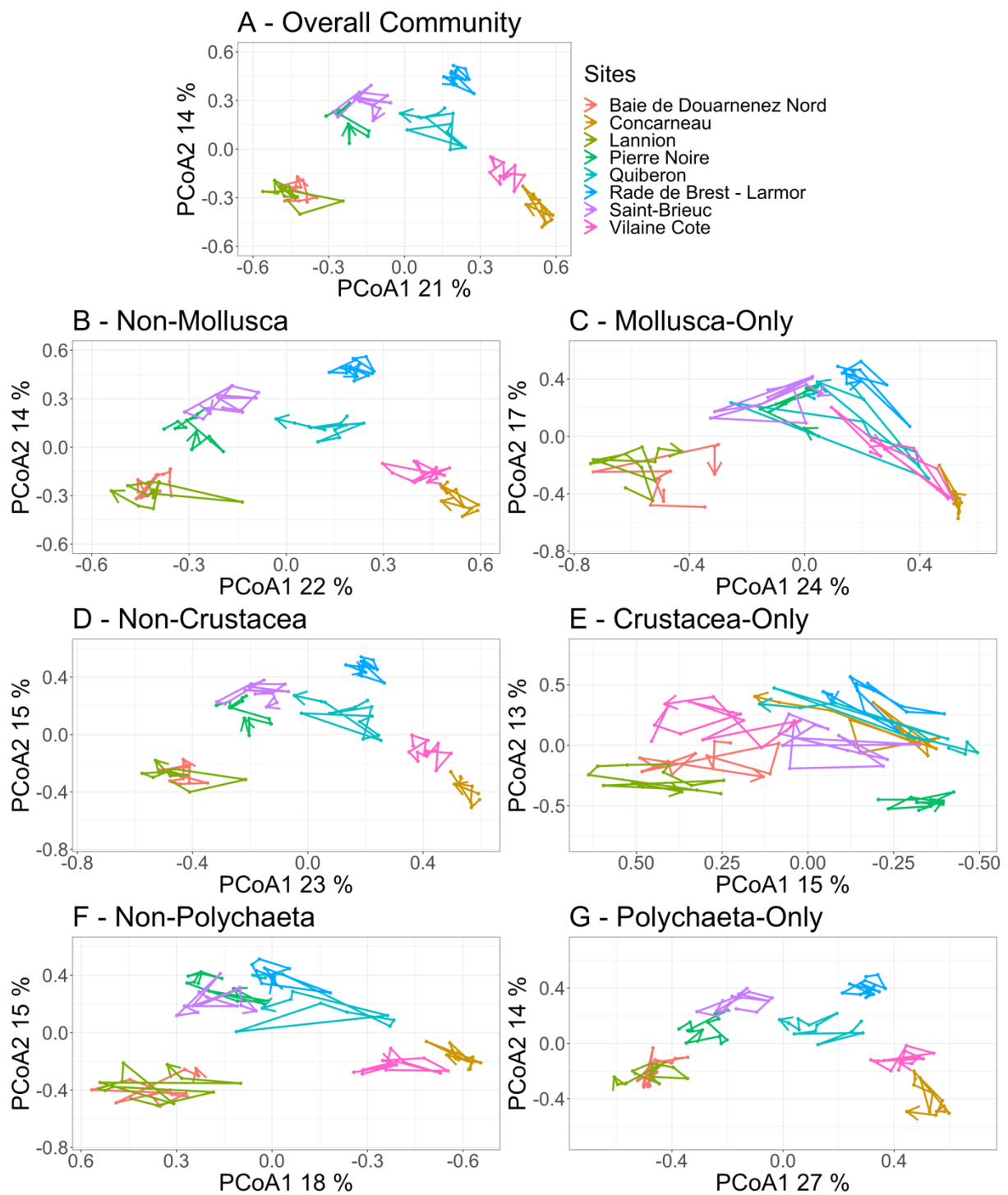


Figure S4: Two-dimensional (PCoA) representation of community trajectories (2007-2019) of the overall community (A), Non-Subset (B, D, F) and Subset-Only (C, E, G) in the subtidal bare habitat. One point represents the community state of a site in a given year (one observation). Site specific consecutive community states are linked by segments which taken together depicts the site trajectory. Arrows represent final community state of a trajectory.

LITERATURE CITED

- Boyé A, Legendre P, Grall J, Gauthier O (2017) Constancy despite variability: Local and regional macrofaunal diversity in intertidal seagrass beds. *J Sea Res* 130:107–122. <https://doi.org/10.1016/j.seares.2017.06.004>
- Boyé A, Thiébaud É, Grall J, Legendre P, Broudin C, Houbin C, Le Garrec V, Maguer M, Droual G, Gauthier O (2019) Trait-based approach to monitoring marine benthic data along 500 km of coastline. *Divers Distrib* 25:1879–1896. <https://doi.org/10.1111/ddi.12987>