

General comments

The manuscript presents MonGOOS, the regional alliance centered on ocean observing systems in the Mediterranean Sea. The study is grounded in a census of these systems, conducted in consultation with regional observation actors across the basin. The consultation methodology is clearly framed, which strengthens the openness and thoroughness of the inventory. While the manuscript section ordering is classical, it is clear and logical, and effectively supports the paper's central aim. I particularly appreciated the contextualization effort given to (i) describe observing systems, (ii) MonGOOS's role within the broader system of global and regional alliances, and (iii) the authors' justification of the chosen terminology. Overall I think the paper fits its central purpose and will be useful for the community and recommends **acceptance with minor revisions** based on the two subsequent points.

My principal criticism concerns the stated goal of "analysing the current state of the Mediterranean observation capabilities" to "evaluating strengths and weaknesses to outline a path for future development," (1175-180) which I find presently under-done, given its prominence as a primary aim of the paper. A complete assessment of strength and weaknesses of the observing system would compare modes of ocean variability against existing observational capabilities, in terms of both resolution and spatio-temporal coverage. I do acknowledge that such an analysis is not feasible for each and every EOVS at the scale of the Mediterranean basin (especially at the paper level). I find that this point could be tuned down or discussed as a perspective. As an alternative approach, I suggest the authors connect their manuscript more explicitly to the official EOVS framework (<https://doi.org/10.3389/fmars.2026.1737002>). Stating for instance which EOVS fall within MonGOOS's scope ; which EOVS should be better observed for societal needs ; and quantifying how often each EOVS is addressed by observing systems. These simple additions would allow to quantitatively pinpoint underrepresented variables or categories of variables (physical, biogeochemical, and ecology & ecosystem) and would grant a firmer basis to the discussion section.

Second, I think the manuscript's form requires tightening. Figures could be improved for aesthetic clarity and, in some cases, modified to better serve their intended purposes. These issues are flagged in the specific comments below. While the manuscript's ideas flow smoothly, I found the writing quality to be uneven. Many sentences need rewriting (e.g., in the section on infrastructures) for typos, grammatical errors, repetition, and inconsistencies. Sections are also not sequential; section 4.6 appears twice. Finally, there are inconsistencies in the references that reference-management software (e.g., Zotero) should easily resolve (e.g., "Milgietta" instead of "Miglietta"; "Liubarsteva" vs. "Liuvaresteva"). These issues are itemized in the technical corrections below.

Specific comments

line 141: the recent publication of the GOOS on EOVS could be referred to: *GOOS Essential Ocean Variables: the backbone of a sustained and evolving global ocean observing system* (10.3389/fmars.2026.1737002)

line 142: What are non-essential variables ? I guess the authors mean variables recognizable as non essential by the GOOS which is not much when considering for each EOVS, all supporting variables, sub variables and derived products associated (see paper above).

line 304-311: HFR are present on OceanOPS but not listed here.

line 318-334: The authors define the terms they will use to refer to each specific observing system. This paragraph is dense and difficult to follow, especially since it is based on a semantic analysis. To simplify reading, I suggest adding the item names in bold maybe at the beginning of each sentence and then to define each of them.

line 344: OBSWG appears here for the first time apart from within the abstract and could be redefined.

Figure 2: On the preprint version, I could not identify the blue bars cited in the text, they appeared mostly white with some black or blue dots with blue dots being referred to within the figure label. Colors could be changed for simpler filled patterns.

The figure caption could be rephrased for clarity especially: *Grey bars show the number of institutions directly reached out for each country / that sent some kind of answer*.

In panel A, I am not certain to read the figure well: From my understanding the gray bars show the initial number of forms sent per country, the white bars indicate the number of replies obtained and the red bar, the total number of replies combining direct replies from institutions and indirect information obtained by the authors. If my interpretation is correct, a flat (or unstacked) bar diagram might be more suited than a stacked one. It would better highlight the number of answers per category and respectively to each country and better frame the consortium initiative to reduce network-driven biases.

I am wondering if panel B is necessary here as countries are already recalled in panel A.

line 490-517: This part (and figure 5) could be added in the supplementary material or in section 2 so to smoothen the manuscript flow.

Figure 6, naming of buoy type seems inconsistent within figure 5, the text, the legend of figure 6 and its caption: e.g., submarine platforms/sea floor.

line 565: *pH is not measured at all at the basin scale*, should it be monitored in the Mediterranean Sea? Is it a critical drawback of the observing system?

This is the type of element that would be interesting to be pushed further in the discussion to better highlight forces and drawbacks of the current observing system.

Figure 7: I think that simpler colors and filled patterns could be chosen by the authors so as to have clearer figures (such as plain colors). I think that panel A and B y-label, shows the number of active floats per year rather than the number of deployment.

I wonder why the total number of floats (black line) is below the Deep and Coastal floats number.

Here again, I think that an unstacked bar chart would ensure better interpretation and comparison of numbers of active floats per year in respect to their categories. Stacked bars chart is however fitting panel B.

Figure 8: I find panel A not so useful. Rather than a figure of all float positions (taken at what time? deployment, midlife, end of life?), the authors could represent a heatmap of profile density which will better highlight sampling (in?)homogeneity. The "present date" could be recalled in panel B.

Section 4.5, The surface drifter section is relatively poor in references:

line 600 *EMODnet Physics lists more than 600 drifters in the Mediterranean Sea*. Is this historically cumulated drifter number or just an active drifter number?

Figure 9: Similarly to the Historical Argo array, I find the representation of surface drifters positions since 2001 not so useful. Maybe a historical bar chart of the number of drifters per year might better show the current state of the observing system?

Trajectories of currently operational drifters could also be added to better frame the Lagrangian aspect of these devices.

Line 632: CAL and VAL are relatively different things for satellite remote sensing. While I can easily imagine validation exercises, I do not know any calibration exercise done at this level. Could the authors give a reference? (One for validation and one for calibration of satellite sensor with data sampled with ferry boxes).

Line 659 to 667 The authors could specify what criteria distinguishes periodic, quasi-period and occasional (every year, twice a year, once every decade?). This section discusses periodic and quasi periodic programs but this concept is neither shown in Table 6, in figure 11 or later-on in the text. As such I suggest removing this sentence fully.

Figure 9 time series stations are hardly distinguishable with repeated cruises when both are spatially overlapping as in the Golf du Lion. On this figure I would find it particularly relevant to connect cruises and time series stations names with their spatial imprint / location. A code could be used (e.g., 1,2,3,4, ...) matching a text box in the figure, with rows number in table 6.

Figure 11 panel A and C, grey triangles above Crete do not relate to any country in the legend. Maybe just recall that they are finished and that these are the Greek systems.

Line 958: From this paragraph, I am wondering if the coverage should be even ?

For instance, are there regions that should be targeted in priority for HFR stations? Are there regions that would not need such an instrument ?

These questions are just examples of content that could be explored further. Observing System Simulation Experiments (OSSE) could answer these questions (how to prioritize future development of the observing system?) but they are never mentioned within the perspectives.

Line 960: even and homogeneous coverage of drifting platforms within the basin was not shown (see comment above on Argo Figure).

From line 980: to what does BGC variables refer to ?

I have the impression that this generic term could be divided into Biogeochemical variables and Ecology and Ecosystem variables if the authors follow EOVS categories from the GOOS.

Technical correction

- Across the document: The authors need to choose a convention in the use of determinants before acronyms: “GOOS” or “the GOOS” / “EOOS” or “the EOOS”.
- line 159: I suggest rephrasing “[...] *and adaptation to the effects that climate change may have on coastal populations and beyond* [...]” to “*and mitigate climate change effects on coastal populations and beyond*”.
- The following sentences could be simplified/rephrased for clarity:
“*In other cases, there are underwater stations located on the seabed (usually in shallow waters) that measure the above mentioned variables at the depth at which the underwater station is located.*” (l. 242). The sentence end is slightly awkward.

“*Unlike stations anchored to the sea floor, these devices drift freely with the current and therefore, they have a Lagrangian character, in contrast to the Eulerian nature of fixed platforms*” (l. 253) Could be simplified.

“*Argo floats periodically descend to a predetermined depth and then, during the ascent, they record pressure, temperature, conductivity, and sometimes biochemical variables, depending on the float type: (i) Core-Argo floats provide temperature and salinity (T/S) profiles down to 2,000 dbar. (ii) BioGeoChemical Argo (BGC-Argo) floats are equipped with sensors for dissolved oxygen, pH, nitrate, chlorophyll-a, suspended particles (via optical backscattering), and irradiance. (iii) Deep-Argo floats are capable of sampling to depths of 4,000–6,000 dbar.*” (l. 255)

This is a long-sentence which could be separated into two: one for the cycling and one for the observed variables

“*For instance, underwater gliders are self-propelled units that operate without a propeller or traditional thruster, and move horizontally and vertically according to a predetermined mission plan.*” (l. 273). Repetition

“*Manual observation methods include all measurements taken from oceanographic or commercial vessels that must be moved to the location where the measurement is performed (oceanographic station).*” (l. 278)

“*This tool was conceived to allow operators to contribute detailed metadata to a centralized inventory, which can then be used by data portals and aggregators to harmonize and update their own metadata records.*” (l. 464)

“*and one of the Core-Argo is a coastal one*” (l. 563)

Line631: *"Moreover,Chl-a data can be used for satellite validation/calibration, while it has been proven as a helpful tool in the study of water circulation, in particular when SST is assimilated into prognostic numerical circulation models to improve their accuracy"* (Korres et al., 2014).

Line 732 : *"the relative scarcity of them in the Eastern Mediterranean"* to *"their relative scarcity"*
"Ocean Gliders form a mature observation network within GOOS, coordinated at the international level by the OceanGliders program from GOOS (<https://www.oceangliders.org/>)." (l 783) GOOS is repeated twice.

"Such missions were aimed at testing this instrumentation or the study of the water masses and ecosystem functioning in the frame of specific research projects (l. 793)"

Paragraph from line 821 to 827 needs tightening and correction. e.g.: *"the southern riparian country"* this sentence ends on an adjective ; *"it has not a budget"* should be : *"does not have a budget"* ; ...

Similarly the next paragraph on EuroGOOS which needs rewriting: ... *the same objectives as* (instead of) *mentioned organization* ... ; Inconsistent use of verb form : *to foster* ; *promote* ; *providing* ; *favoring* ; as *a* non-profit organization ; in Brussels instead of at Brussels

- line 261: it seems that an adjective is missing: *as become a (major, essential,important?) component of GOOS*
- line 327: *As it will be shown*
- Chapter 4.4: the term *basin* is repeated many times
- Several times: *"analyzed at the laboratory"* or *"analyzed in a laboratory"*, I also saw just *"at the lab"*
- Table 5, "AJACCIOI" is written instead of "AJACCIO"
- line 930: *"because of the cut of funds"* to *"because of funding cuts"*
- "Observation programm/platform/system" or "observing programm/platform/system" is inconsistently used over the manuscript
- The term *"include"* is heavily repeated in section 5.
- TAD number is 85 in the Abstract but 88 at line 458.