Project	AtlantOS – 633211
Deliverable number	D3.1
Deliverable title	One stop shop web site for TMAs
Description	Establishment of community shared "one stop shop" web site for TMAs where 1) the TMA network as a whole is introduced (partners, common themes, data products); 2) High-level TMA products (volume transport, heat transport) can be obtained; 3) documentation (calculation, error bars) of the products is provided; 4) links to data behind the high-level products (OCEAN SITES); 5) joint cross-TMA network analyses are provided. To achieve this deliverable one workshop will be held (in project month 8).
Work Package number	WP3
Work Package title	Enhancement of autonomous observing networks
Lead beneficiary	In principle, this is the global climate scientific community dealing with ocean transport data for tasks like model validation, assessing the role of advection for physical, biological, and chemical processes.
Lead authors	Ursula Schauer, Torsten Kanzow (AWI)
Contributors	Colleagues from Uni Bremen Germany, FMRI Faroe Islands, Uni Hamburg Germany, HMFRI Iceland, MSS UK, BSH Germany, GEOMAR Kiel Germany, IFREMER France, SAMS UK, SIO US, WHOI US, NOC UK, BODC UK, SHN Argentina, USP Brazil, ENS France, UCT South Africa, NOAA US, AWI Germany.
Submission data	The first parts of the TMA website, kindly hosted by OceanSites, was established in April 2017. First parts of the TMA website have been uploaded by that time.
Due date	PM16
Comments	The final deliverable of a one-stop shop is late, although many steps towards this achievement are already taken. Delays are due to several reasons: 1. Communication, arrangements and organisation between more than 20 partners providing information and making data and data products available, and the host for the one-stop shop (OceanSites) took much more time than planned. Issues like the combination of the individual arrays to the

	final TMAs, data formats, duplications etc. needed to be clarified through many iterations. 2. Some TMAs are very new and data are not yet available. 3. Change of project personnel at AWI responsible for the task caused some further delay.

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One stop shop web site for TMAs

Transport mooring arrays (TMAs) installed in various locations in the Atlantic represent a relevant element of the integrated Atlantic observing system. The great value of TMAs is the acquisition of long time series of volume fluxes in locations that are related to the Atlantic meridional overturning circulation (AMOC). The time series can also be used, in combination with temperature and salinity measurements, to derive heat and freshwater time series. WP3.3 should offer easy access to these time series and their products.

To create a TMA network in that sense, at first an overview was obtained of existing mooring programs that would form a comprehensive and sustainable data set. Owners of such programs inside and outside EU that are not official partners of AtlantOS were contacted and encouraged to contribute their data and become a member of the AtlantOS TMA network. The outcome of this interrogation was that mooring programs capture 8 latitudes in the North and South Atlantic. Hence, the sub-arrays and suitable individual moorings were grouped into 8 main arrays, for which the term TMA is used further on, that capture the Atlantic Ocean between 79°N and 35°S. The TMAs are (Fig. 1):

1. Fram Strait
2. GSR Greenland Scotland Ridge
3. OSNAP Overturning in the Subpolar North Atlantic Program
4. NOAC North Atlantic Changes
5. RAPID-MOCHA-WBTS Rapid Climate Change / Meridional Overturning Circulation Heat-flux Array / Western Boundary Time Series
6. MOVE Meridional Overturning Variability Experiment
7. 11°S
8. SAMBA-SAMOC South Atlantic Meridional Overturning Circulation

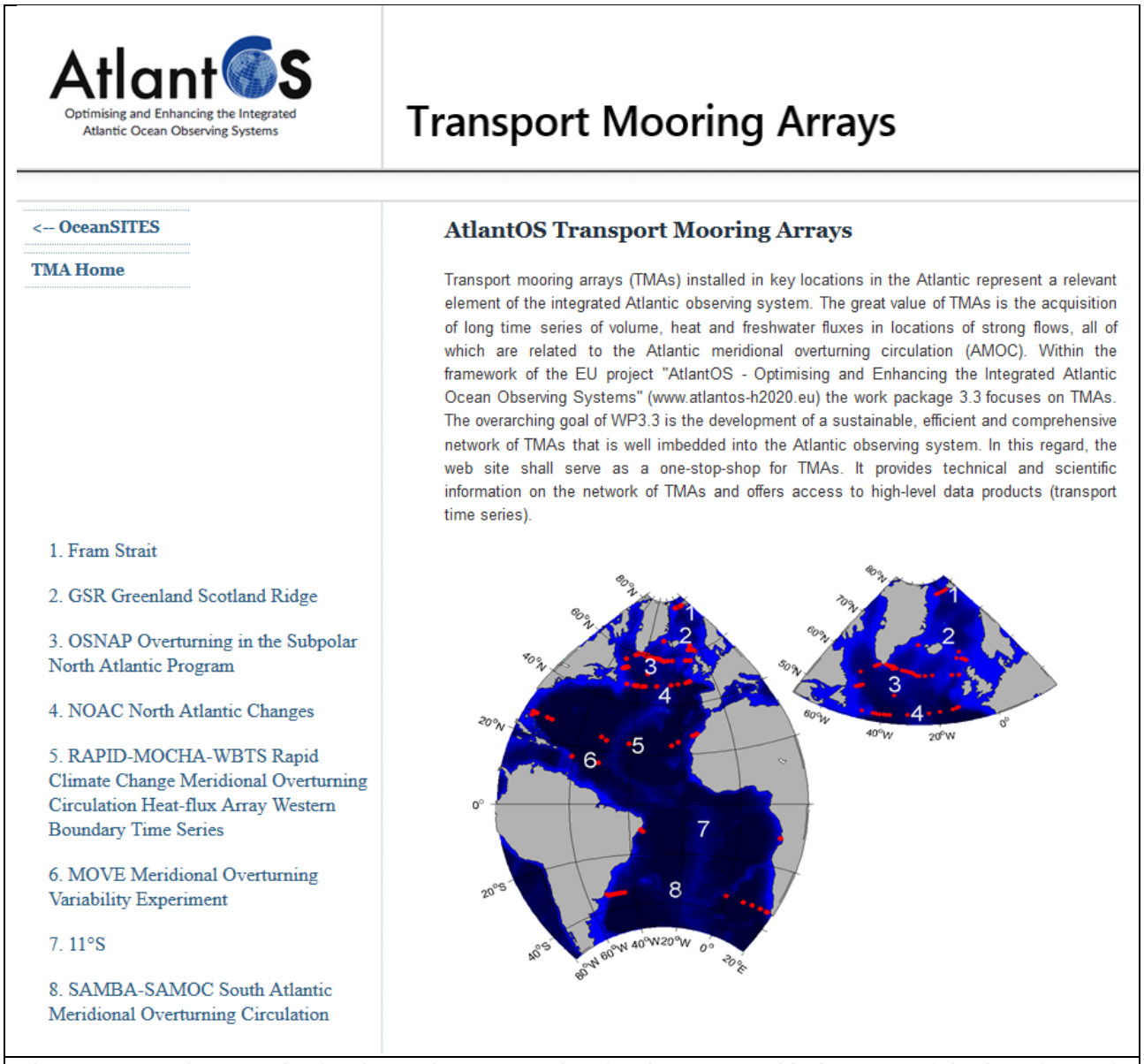

Figure 1: Introductory site for the web presentation for the TMAs with the map of the locations of individual moorings (red dots) that were assembled to AtlantOS TMAs (white numbers).

Some TMAs are run by a single institution; others, like OSNAP, TMA 3, are a combination of sub-arrays maintained by up to ten partners from six countries. Funding ranges from institutional money to third-party funding with the related uncertainties for the future.

To obtain and provide basic information of the data and programs, a questionnaire was developed which was sent to all contributing partners. From the return, a brief overview was compiled for each TMA (as an example, see a clipping of the site information for TMA1, Fram Strait, in Fig. 2. The full site can be seen at http://www.oceansites.org/tma/fram.html).

In a next step, issues of data policy and formats between owners of mooring arrays, their archiving of original data and the data policy of OceanSites as a host for AtlantOS products and data needed clarification. Only after sorting this out, we started to collect the original data and the volume transports from the partners. The return of these data depends of course on the state of the

programs, since some of them run already for several years, while others have only started recently and the first moorings are still in the water.

Finally, in collaboration with Anthonin Lize from JCOMMOPS a test web presentation was established **http://www.oceansites.org/tma/index.html**. This site will be filled for all TMAs and successively be open to the public.

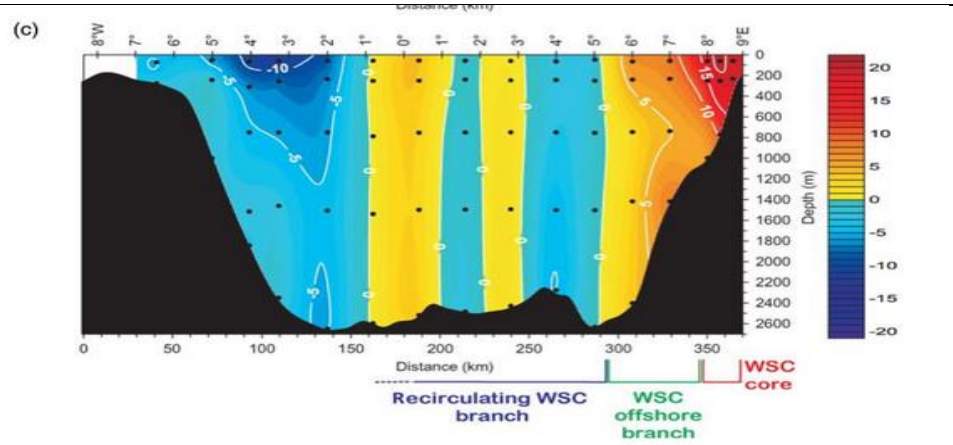

Figure 1: (a) Mooring locations with mean current vectors overlaid on the bathymetry in Fram Strait. (b) Cross-section of mean mooring derived temperature; the individual instrument locations are marked by black dots. (c) Cross-section of the mean mooring derived northward (i.e. across the section) velocity. WSC: West Spitsbergen Current. Locations of the WSC core and the WSC offshore branch are indicated at the bottom. (Beszczynska-Möller et al., 2012)

Data products: volume transport time series

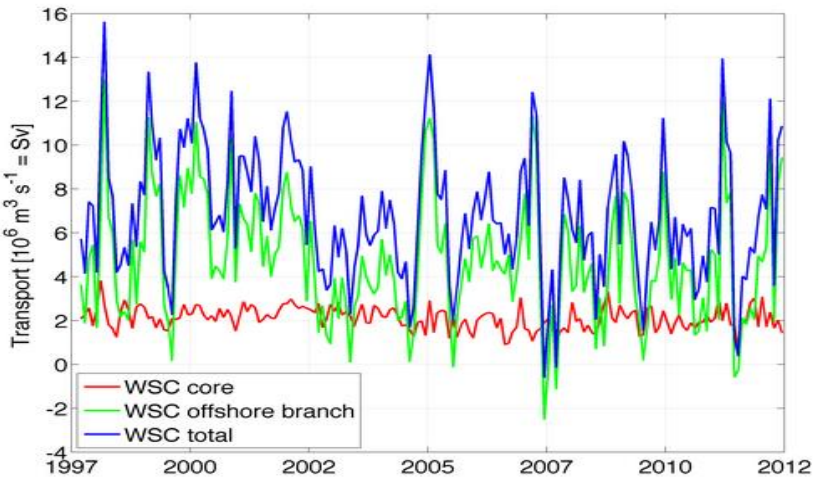

Fig. 2: Time series of volume transport in the West Spitsbergen Current core, offshore branch, and the total. See Figure 1 for branch division.

Figure 2: A clipping from the web presentation of TMA 1, Fram Strait, on the TMA one-stop shop hosted by OceanSites. For the full TMA 1 presentation, see **http://www.oceansites.org/tma/fram.html**