SCAR 2016 -
Data access and sharing for cutting edge science (Session 35)

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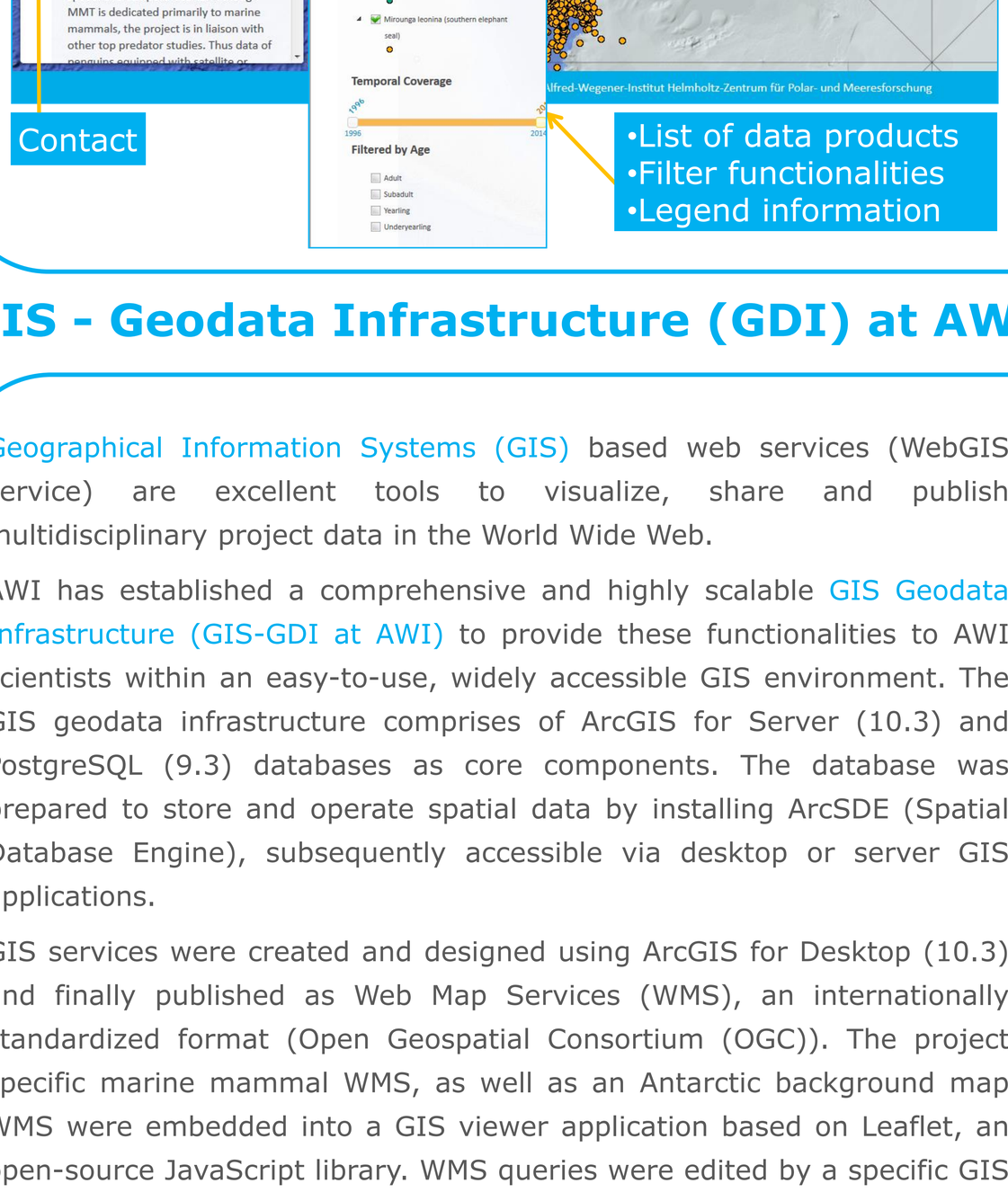
Marine mammals in the Southern Ocean – How WebGIS technology and GIS infrastructure support data visualisation, publication and sharing

Marine Mammal Tracking (MMT) – Motivation and Project Data



The Marine Mammal WebGIS at AWI contains about 350,000 locations of Antarctic seals satellite tracked in the Southern Ocean within the past 20 years. Here we present validated data (*post hoc* positioning reconciliation with oceanographic data and / or bathymetric data) for the first time as a WebGIS service.

Data have been collected using ARGOS satellite transmitters for marine mammal applications that are designed to provide at-sea locations and transmit these data to polar-orbiting satellites when the seals surface. Data about dives (i.e., dive depth, dive duration, post-dive surface interval) as well as *in situ* measurements on hydrographic features (i.e., water temperature and conductivity) for the entire migration path of tracked individuals have been recorded.

Although all data are accessible via PANGAEA (www.pangaea.de) displaying data within a WebGIS environment offers the possibility to provide information just by visualisation. General information about e.g. measurement locations, their distribution and density can easily be viewed. Data filter functionalities enable users to predefine queries in a more interactive way. Furthermore, the integration of content-specific scientific data layers like ice coverage or sea surface temperature provides the opportunity to display the related environmental complexity, and also the presences or absences of other organisms (e.g. krill).

GIS - Geodata Infrastructure (GDI) at AWI

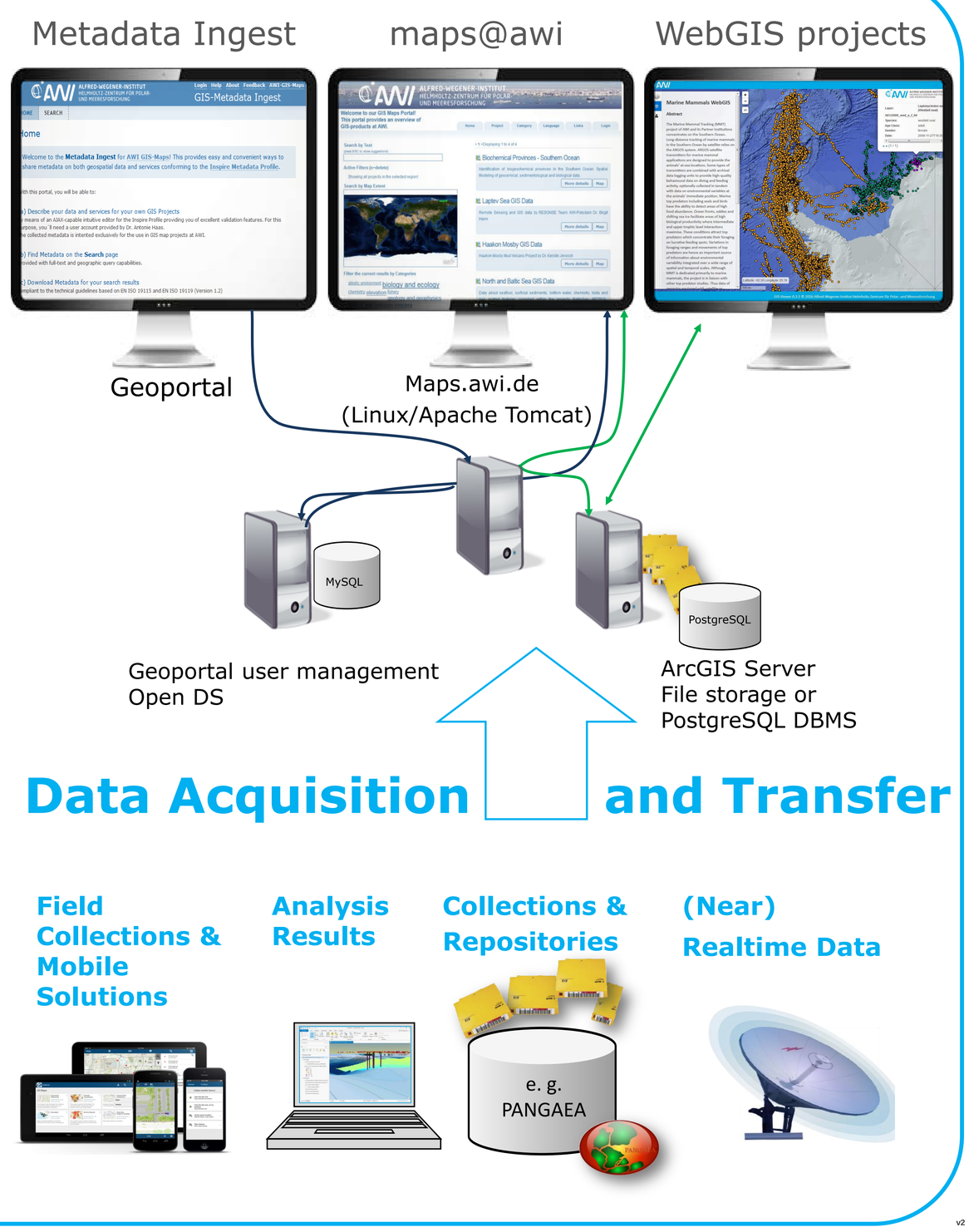
Geographical Information Systems (GIS) based web services (WebGIS service) are excellent tools to visualize, share and publish multidisciplinary project data in the World Wide Web.

AWI has established a comprehensive and highly scalable GIS Geodata Infrastructure (GIS-GDI at AWI) to provide these functionalities to AWI scientists within an easy-to-use, widely accessible GIS environment. The GIS geodata infrastructure comprises of ArcGIS for Server (10.3) and PostgreSQL (9.3) databases as core components. The database was prepared to store and operate spatial data by installing ArcSDE (Spatial Database Engine), subsequently accessible via desktop or server GIS applications.

GIS services were created and designed using ArcGIS for Desktop (10.3) and finally published as Web Map Services (WMS), an internationally standardized format (Open Geospatial Consortium (OGC)). The project specific marine mammal WMS, as well as an Antarctic background map WMS were embedded into a GIS viewer application based on Leaflet, an open-source JavaScript library. WMS queries were edited by a specific GIS viewer editing unit.

maps.awi.de - a JavaScript application lists publicly available WebGIS projects which are realized by AWI scientists and various project partners. It offers filter functionalities either by key words or by locations as well as a brief introduction into the project and links to access the WebGIS project.

Future plans related the GIS infrastructure are the integration of further GIS viewer functionalities like individual track filtering.
Future plans related to the marine mammal WebGIS project are of course the integration of further data sets with new tracking data as well as data of environmental conditions.



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