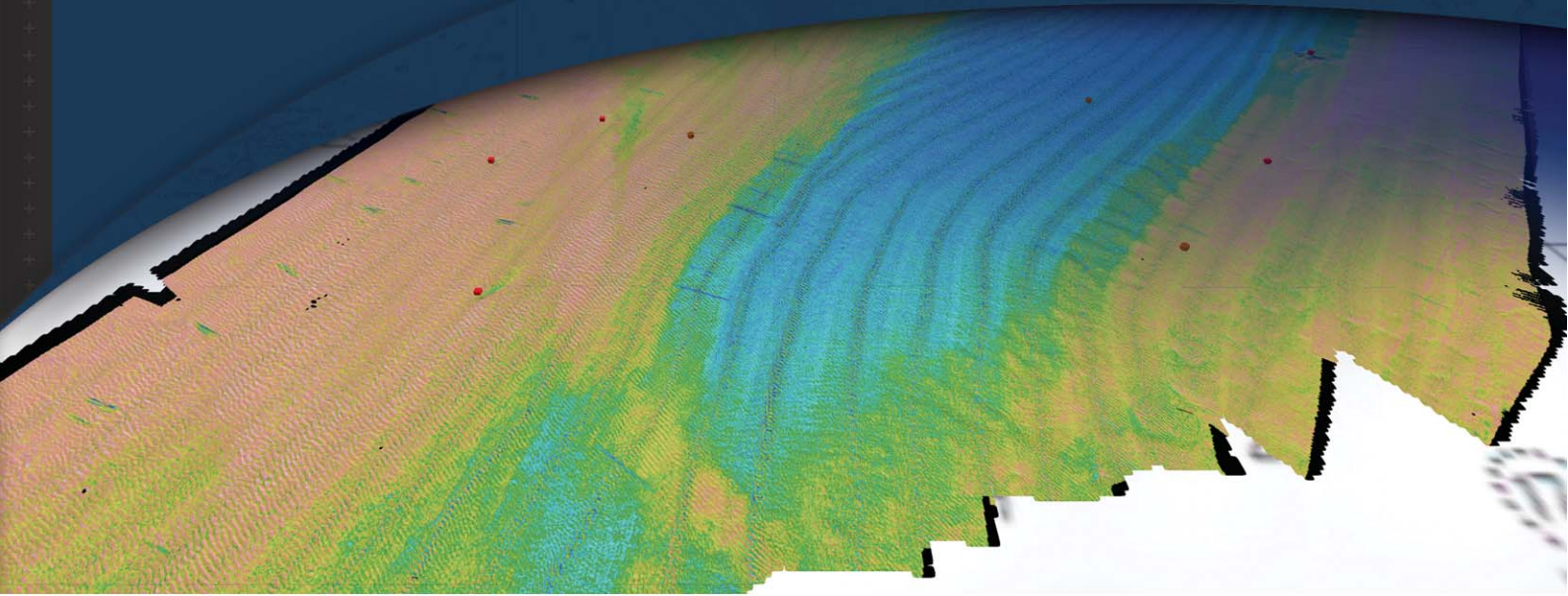# Fledermaus
FM Habitat

The integrated marine habitat toolbox

The only software package to combine 4D visualization with cutting-edge backscatter processing and bathymetric analysis for seabed characterization and a direct link to ArcGIS software[1]. Integrating powerful Fledermaus visualization with our new, completely rebuilt backscatter processing engine FMGeocoder Toolbox[2], enhanced digitizing and interpretation tools, algorithms tailored towards habitat products, and database integration, FM Habitat provides the user with a comprehensive toolkit for interpretation and characterization of the seafloor as well as the ability to present work in an intuitive manner.

FM Habitat is the ideal software bundle for:

- **Geoscientists and technicians** characterizing the seafloor for the creation of interpretive maps.
- **Interdisciplinary habitat mapping teams** of biologists, geologists, and managers in need of a collaborative working environment, efficient classification tool, and presentation software.
- **Fisheries managers** responsible for maintaining and distributing marine habitat information.

FM Habitat moves users beyond traditionally isolated characterization methods to an integrated bathymetric and backscatter solution. It allows you to efficiently determine the best possible interpretation of the
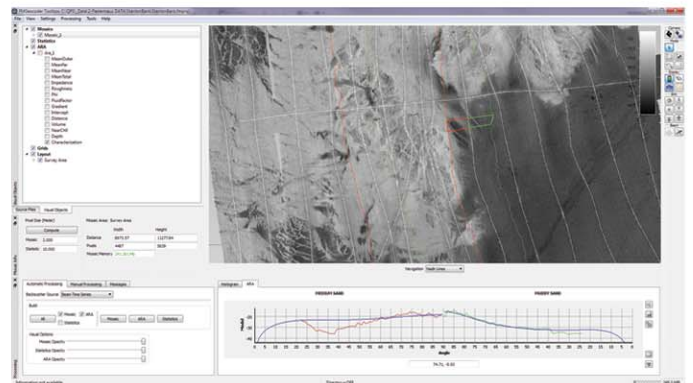
Seafloor characterization with FM Geocoder

seafloor by combining the latest tools in remote seabed characterization — rugosity and roughness algorithms for bathymetry and full corrections of the sonar backscatter signal for data analysis — in an intuitive 4D environment.

The direct integration of bathymetric and backscatter analysis, mosaicing, seafloor characterization, seafloor interpretation, and powerful visualization, with a seamless, direct interface to ArcGIS software[1] —vital pieces in the marine habitat toolbox in one software solution.

Fledermaus

Import and integrate data from multiple sensors, databases and third party applications

- Create sun-illuminated 3D surfaces from gridded and ungridded data, using an easy, wizard-based interface.

  - Direct support for many public domain and commonly used grids – ETOPO, GMT, BAG, Esri, NetCDF, Surfer, etc.
  - Direct integration to ArcGIS(1) Geodatabase for seamless transfer of bathymetric and scalar raster information to your scene.
  - Supports all major multibeam, swath sonar, and bathymetric lidar data formats, as well as common transfer formats and generic ASCII.
  - Display datasets of multiple resolutions in the same scene without resampling or degradation.
  - Create grids based on any measured or interpreted raster attribute (roughness, hardness, slope, grain size, etc.).
  - Full support of common and custom geospatial projections.

- Import multiple imagery formats and types including geologic maps, previous interpretations, sidescan mosaics, seafloor photographs, and video stills.

  - Dynamically drape imagery on seabed to integrate it with the topography and support assessment of seabed type.
  - Display seismic or subbottom profiles relative to surface data to show past horizons and support interpretations of geomorphologic features.

- Seamlessly integrate and interpret multi-attribute data from tables, files, or GIS databases with direct integration of ArcGIS(1) software.

  - Import sediment sample, core, and bottom photograph location points.
  - Add navigation tracklines and video draglines.
  - Show habitat-defining shapefiles and polygons.
  - Drape 2D data to the surface to easily derive a Z at any location.

- Take advantage of the addition of time referencing to the geo-spatial framework—import time-stamped data to show mobile sediment migration, species movement, pollutant dispersal patterns, or sea level change.
- Option to add water column data processing (FMMidwater) to create time-aware beam fans, beam curtains, volume and point objects of water column data ranging from methane plumes to fish populations.

Integrated analysis, interpretation and characterization of marine seabed data in an intuitive 4D visualization environment

- Manipulate surfaces to get the best possible representation of the seafloor using interpolation, masking, cropping and re-sampling tools.
- Create and edit color maps and shading parameters to suit data and type of analysis.
- Use interactive digitizing, editable "node-less" interpretation and labeling tools to geo-pick points and define areas for interpretation or for use in an area-based analysis; export attributed polygonal and point locations to file or database, create an interpretation geotiff for draping, or create ASCII area reports.

- Use the new FMGeocoder Toolbox (2) module to create and analyze completely corrected sonar backscatter data.

  - Efficiently produce optimum sonar mosaics.
  - Use the Angular Response Analysis to aid seafloor characterization.
  - Create texture sheets of sediment type, roughness, and grain size.
  - Generate statistics of the corrected backscatter to support interpretations.
  - Transfer results and products directly to ArcGIS.

- Analyze your integrated data with our growing suite of tools.

  - Perform slope analysis using one of several algorithms.
  - Instantly and interactively profile anywhere on the surface. Compare along -ground distance to grid distance for an indication of roughness, or calculate average slope across a feature.
  - Quickly calculate the roughness or rugosity of an area using new surface texture tools.
  - Generate contours and compare to chart to estimate sandwave migration.
  - Compare overlapping surveys to estimate change using the surface difference tool.
  - Monitor the location of objects—vessels, AUVs, ROVs, gliders, or tagged animals—in real-time via serial cable or UDP packet; save tracks for later playback.

Products, data export, and database integration

- Create and edit powerful interactive visualizations and movies for presentation and distribution using time-supported objects, a new scalable time interface, and brand-new key-framing tools.
- Produce high-resolution graphics for reports, posters and publications.
- Generate and transfer the results of seabed interpretation and associated information directly to ArcGIS (1) software, or export in a variety of common industry formats.

  - Vector formats: point files, polygons, and contours.
  - Raster grids: bathymetry, backscatter, and attributes.
  - High-resolution geo-referenced imagery: mosaics and sun-illuminated surfaces.

- Export Google Earth KML and KMZ files for upload and distribution.
- Foster collaboration and education with highly immersive, interactive visualization.

  - Interactive temporal-spatial scenes can be shared using the free viewer, iView4D.
  - Full stereo support, both active and passive, for presentation in visualization centers and on GeoWall systems.