SEEQUENT

Synthetic Seeding for AGC Surveys

NAOC/M2G2 – February 2023

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Problems / Motivation

- For dynamic surveys, how can we demonstrate that we are able to meet the projects objectives throughout the survey area. To answer questions like:
  - Are there areas, where due to site noise items could be missed?
  - On my site - how deep can you classify anomalies correctly?

- Co-located seeds were not always correctly identified in cued/static surveys.

- Can the assessment of background measurements be improved?

Note: These presentation is forward looking, while I hope these will be in the next release this may change.

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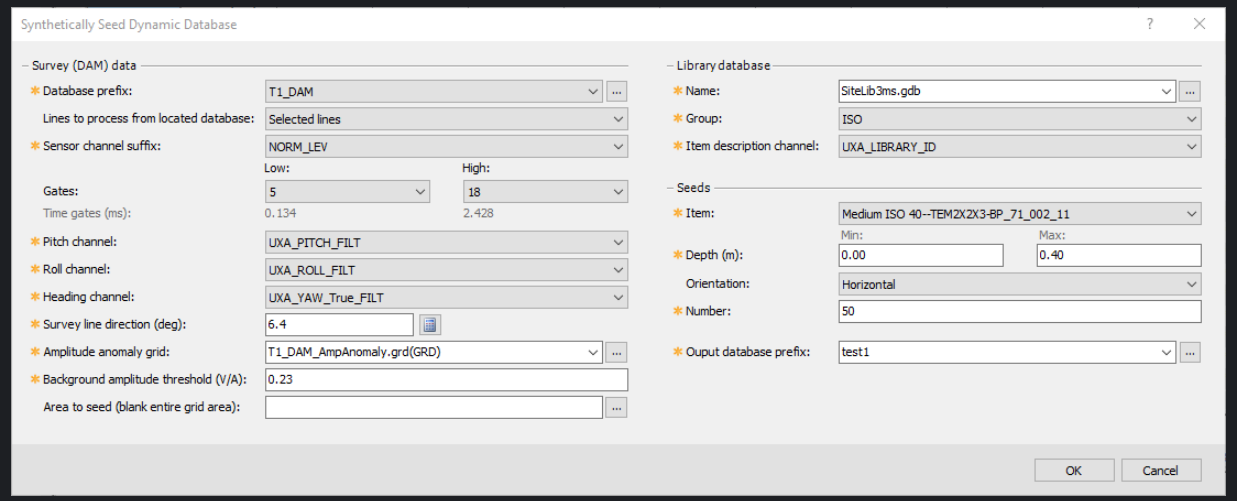
Synthetic Seed Dynamic Data

- Add a synthetic seed responses to survey data
  - Location, random within a defined area but avoid anomalies
  - Depth, random within a range
  - Orientation - Inclination (Horizontal/Inclined/Vertical) or random
- A new datatype, DSD
- Preparation for seeding
  - Data processing
  - Leveling
  - Background removal
  - Create Located Database
    - Create Amplitude grid
- Post seeding (just like DAM)
  - Create Located Database
    - Create Amplitude and Coherence Anomaly grids
  - Pick targets
  - Classify and Rank
- Report on Seeds Statistic



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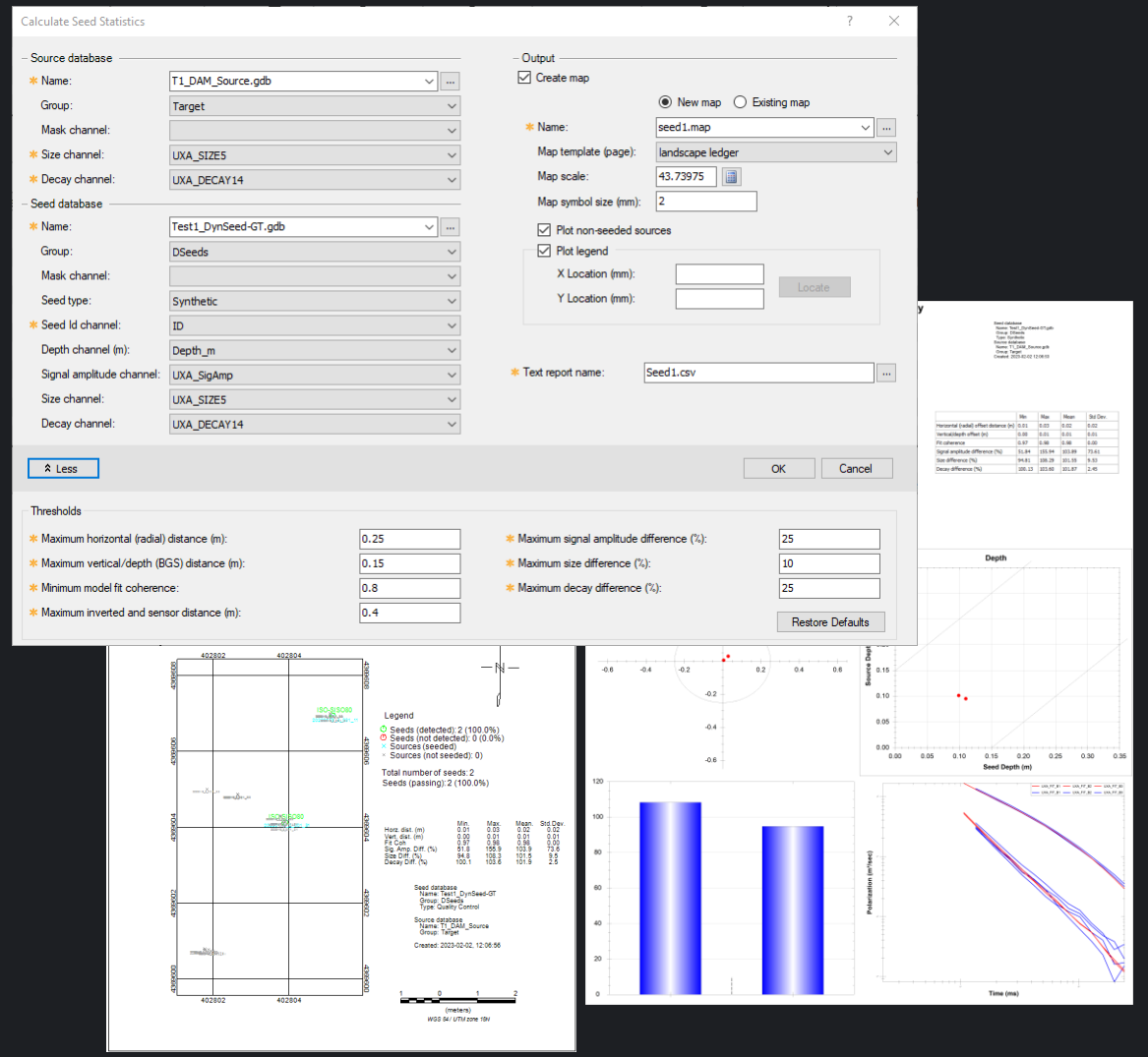
Calculate Seed Statistics

- Easy to use for AGC data
- Ideally your seed data include:
  - Depth
  - Signal amplitude
  - Polarizabilities
  - Size and Decay
- Output
  - Add result channels to the seed database
  - Identify the seeds in the source database
  - Export seed results to a CSV
  - Summary plot
  - Map



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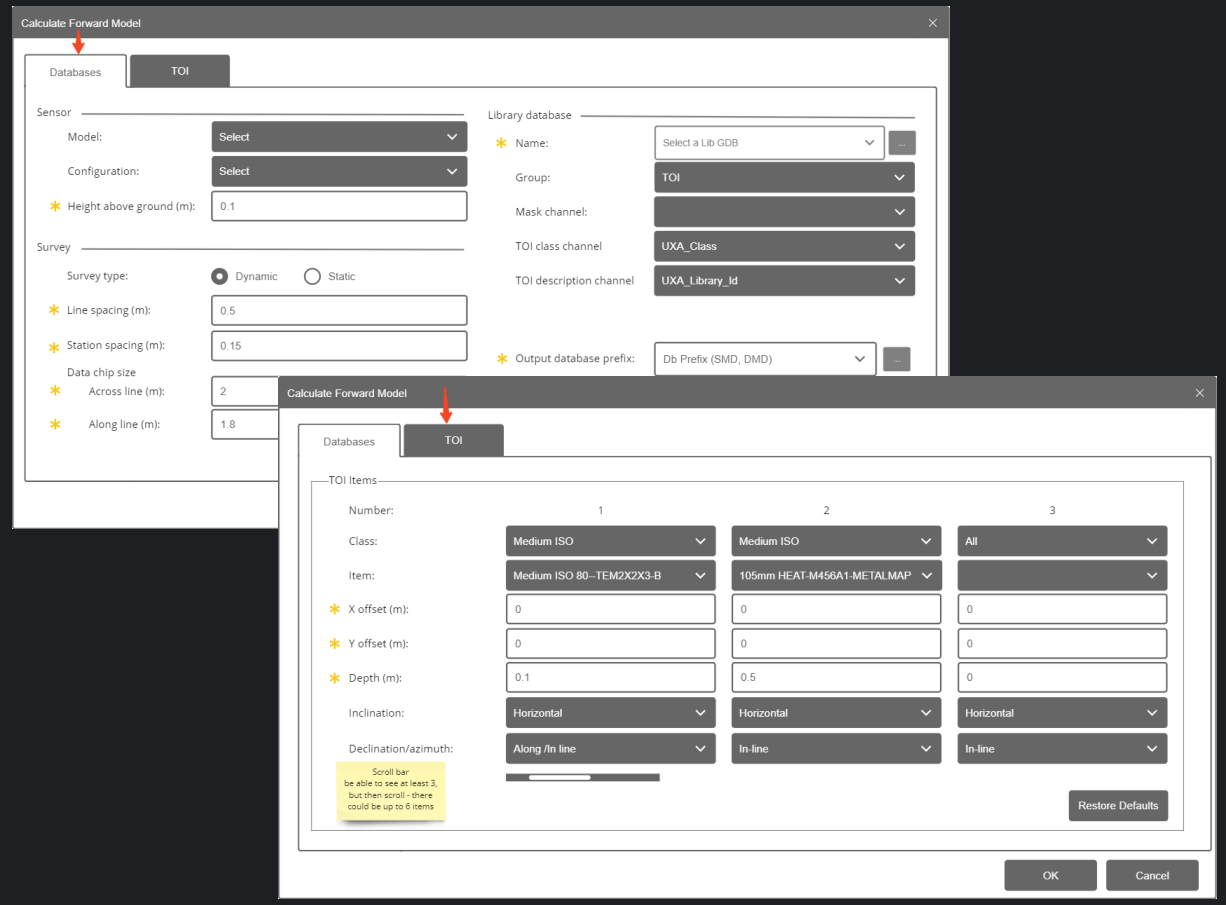
Forward Modelling

- Easier to use tool
  - Separation from Depth Response Curve

- Add support for:
  - dynamic (multi-shot) measurements
  - multiple TOI



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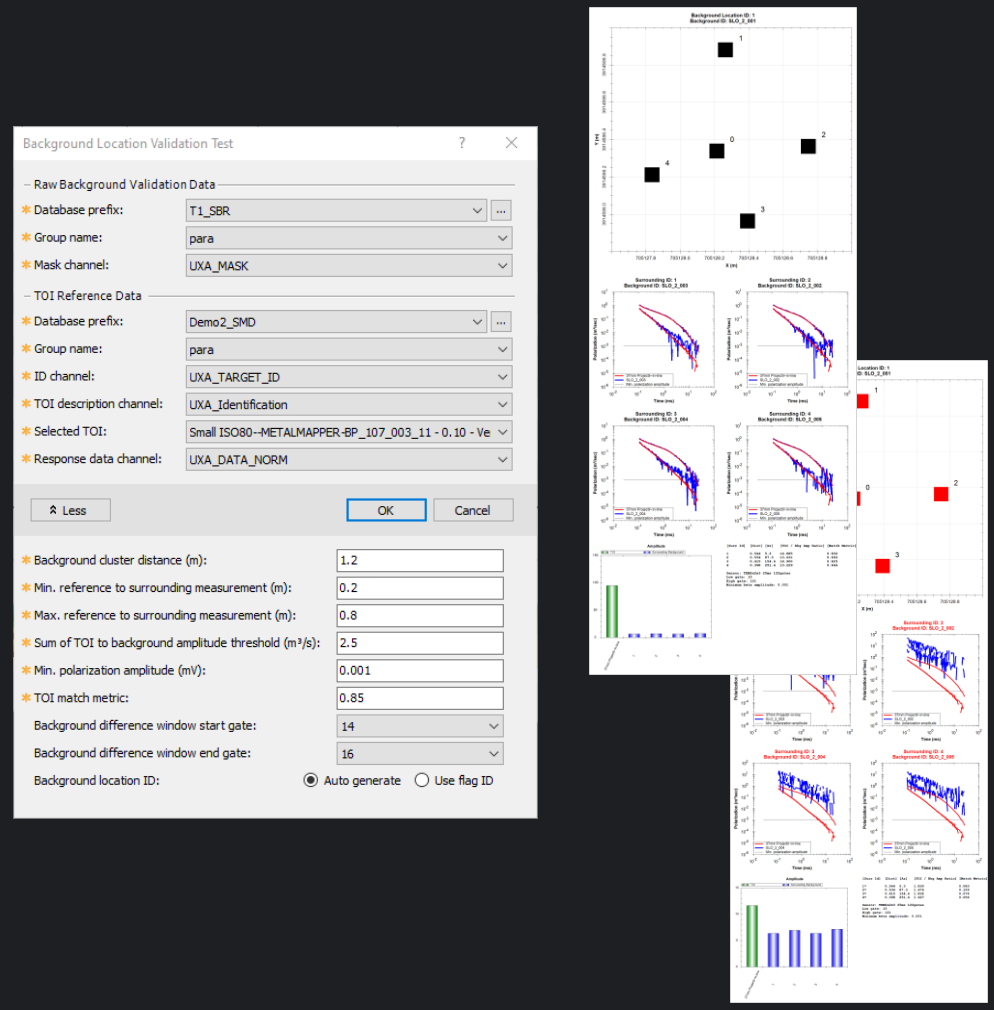
Background Location Validation Test

- Update to support multiple items



Note: For static/cued surveys, this tool along with the depth response, can be used to understand the limitations for AGC at a site.

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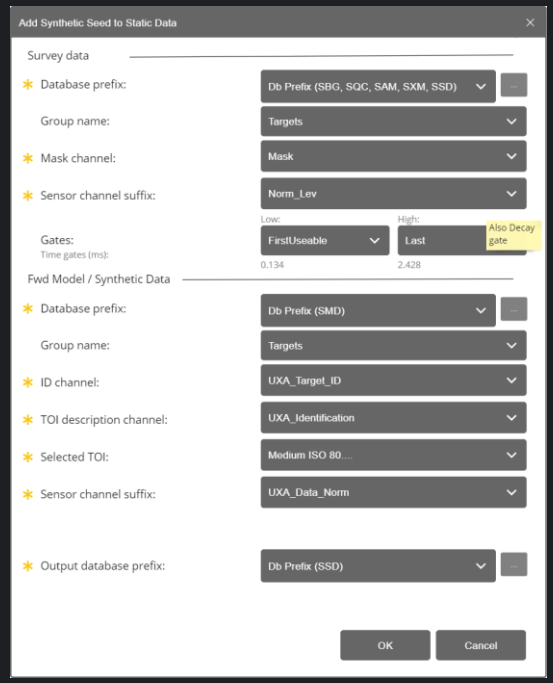
Synthetic Seed Static Data

- Add synthetic seed to other static/cued data
  - Primarily background measurements (SBG)

- A new datatype SSD



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What now, and next?

1. Do you have feedback and can provide data examples?

   Reach me at: Darren.Mortimer@Seequent.com

2. Explore how can synthetic seeds help with improve AGC quality control, supplementing physical seeds?
   - Enable a better understanding of the limitations of the current technology.
   - Where can we (as the industry) further improve?

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