OPEN NAVIGATION SURFACE WORKING GROUP

MEETING SUMMARY

2015-09-15
Shallow Survey

DRAFT VERSION
2015-11-21

1 Introduction

This document details the result of the meeting held on 2015-09-15 to discuss future development plans for the library, and in particular the design and implementation of a variable resolution version of the BAG format. This meeting was held at the 6th International Conference on High Resolution Surveys in Shallow Water (Shallow Survey 2015) in Plymouth, UK. The summary of all meetings and teleconferences of the Open Navigation Surface Working Group (ONSWG) can be obtained from the project's web-site, http://www.opennavsurf.org. For a list of participants, see section 4.

In the following, names of people with action items are shown in **BOLD SMALL CAPS**; expected deadline release dates are shown in red. Sizes of variables are indicated by 'U' for unsigned, 'S' for signed, 'F' for floating-point, and a size in bits (e.g., U8 is an eight bit unsigned integer, F64 is a 64-bit (double precision) floating point number). Data sizes are given in bytes (B) with the usual convention that the SI multipliers are taken to mean multiples of 2^{10}B (i.e., 1kB = 2^{10}B = 1024B). The acronym 'CR' means 'Candidate Release' (i.e., a release of the library for comments) and 'FR' means 'Full Release' (i.e., release V1.6 of the library).

2 Summary of Discussion

2.1 Variable Resolution bag proposal document

2.1.1 Implementation Details

The participants discussed the proposal for a variable resolution gridding extension for BAG files, which had been previously circulated. In the interim, an implementation of the proposal had been provided by **CALDER** in branch 'variableresolution' of the Git repository for the project. There was general agreement that a variable resolution extension should be pursued sooner rather than later, and that the proposed extensions would be acceptable with small modifications, at least as a first pass version of variable resolution, to possibly be extended in the future.

Specifically, there were requests for:

- An arbitrary offset for the refined grid embedded in the low (fixed) resolution grid so that it is not necessarily centered in the low resolution grid cell;
- Arbitrary low (fixed) resolution in easting and northing so that the low resolution cells are not assumed square; and
- Arbitrary refined (variable) resolution in easting and northing within each low (fixed) resolution cell so that the refined cells are not assumed square,

which are required by some implementations as support for their specific extensions to the base variable resolution structure currently proposed. Calder

agreed that there should not be any significant difficulties in including these extensions, and agreed to investigate (**ACTION: CALDER**.)

2.1.2 Timeline

The participants agreed that there were some concerns of timeliness with variable resolution implementations of BAG, since there were implementations of variable resolution grids being developed, and no exchange mechanism. Consequently, although the participants agreed that this might not be the final version of variable resolution to be developed, it would certainly provide an intermediate product that would provide user support for variable resolution grid exchange until better designs were developed.

Consequently, it was agreed that the 'variableresolution' branch of the library should be considered for candidate release as version 1.6 of the library by the end of calendar Q4, 2015. (**ACTION: CALDER**.)

2.2 Binary Testing Executable

Prompted by reports of interoperability difficulties with different implementations of the core bag library, the participants debated the wisdom of providing a standard binary testing executable that could be used to validate all BAG files, based on the use of the standard library as a reference. Valid BAG files would be, by definition, those that could be read successfully by the testing executable.

The participants agreed that this would certainly solve the difficulty with testing, but would possibly add some difficulty in maintaining a binary distribution of the library and associated executables, particularly on Windows platforms (sourcing binary distributions has been found to be problematic in the past). **CALDER** indicated willingness to host binary packages on the project's website, although this would not solve the issue of building the packages in the first place.

Part of the difficulty appeared to be complexity in building the distribution straight from the repository; making this a simpler process might in turn make it possible to automate the builds so that each release could be built and tested automatically. **CALDER** agreed to investigate this possibility. (**ACTION: CALDER**.) The issue of developing the binary test executable was tabled.

2.3 Tiled BAGS and Sparse Arrays

Driven by concerns of efficiency in storage of BAG files, the participants discussed the potential for using native tiles in HDF5 as a means to allow for sparse arrays (i.e., rather than having to store the 'no data' value for both elevation and uncertainty mandatory layers everywhere). None of the participants were entirely sure how this would affect the current implementation of the library, but **MASRY** offered to investigate. (**ACTION: MASRY**.)

2.4 API Maintenance

The participants discussed, and agreed, that it was probably time to take a step back from the design of the current API and assess whether, after over a decade of development, it still satisfied the basic requirements of the group. The primary issues of concern are increasing complexity in the API, encroaching C++ components

in the library, and redundant components that have not been fully removed. In discussion, there were suggestions that the library might benefit from being re-implemented as a native C++ library (which could take advantage of HDF5 C++ object bindings), but with C-language API interfaces so that linkage issues would be minimized.

Since this is a complex issue, and will likely involve significant changes to the library, the participants agreed to collectively review the library and suggest changes (to the development e-mail list) by the end of calendar Q4 of 2015. (**ACTION: ALL.**)

3 Summary of Action Items and Dates

The following actions and dates were agreed:

Person	Action(s)	Section	Date
Calder	Update VR implementation	2.1	2015-11-30
	Merge VR implementation as CR	2.1.2	2015-12-30
	Investigate automatic building	2.2	2016-03-30
Masry	Investigate tiling in hdf5	2.3	2016-03-30
All	Provide api feedback to list	2.4	2015-12-30

4 Participants

Jonathan Beaudoin (QPS)
Brian Calder (CCOM/JHC)
Mark Masry (CARIS)
Shep Smith (NOAA)
Matt Thompson (NAVO)