README for performing non-local means filtering on Dragon’s Back Pressure Ridge.

NL\_means\_filter.cpp driver file to perform non-local means filtering following Baudes et al (2005).Copyright (C) 2013 Martin D. Hurst

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Martin D. Hurstmhurst@bgs.ac.uk

The non-local means filtering algorithm is performed using code that can be compiled using the makefile NL\_means\_make.make:

$ make –f NL\_means\_make.make

This generates the executable NL\_means.out which can be run from the command line using:

$ ./NL\_means.out <args>

The topographic data is read and written in ARC \*.flt format, which can be created using the Raster to Float conversion tool in the ARCGIS toolbox. The algorithm requires four input arguments; an input file descriptor (e.g. “db” where the DEM is named “db\_dem.flt”) and three filtering parameters. The filtering parameters are the search window radius, i.e. the distance around the cell of interest in which to analyse the surface and get a non-local mean; the similarity window radius, i.e. the distance around neighbouring cells in which to analyse the mean elevation; and the degree of filtering (try 2). Hence non-local means filtering can be performed using the command:

$ ./NL\_means.out db 2 2 2

The algorithm outputs two new \*.flt grids: a filtered DEM and a noise raster, which is the difference between the filtered and unfiltered DEMs.

The code is dependent on the template numerical toolkit (TNT) contained in the directory, which contains a templated linear algebra package distributed by NIST (<http://math.nist.gov/tnt/>).