**1) Create ocean mask to remove terrestrial areas**

**2) Apply sun glint correction following Hedley, Harborne and Mumby (2005):**

R’i = Ri – bi(RNIR-MinNIR)

Which means: reduce the pixel value in band i (Ri) by the product of regression slope (bi) and the difference between the pixel NIR value (RNIR) and the ambient NIR level (MinNIR).

**Step by step implementation:**

a. Select a sample area (or areas) of the image displaying a range of sun glint, but where the image would be expected to be more or less homogeneous if the sun glint was not present (e.g. over deep water). Determine MinNIR, the minimum NIR brightness in this sample.

b. For each band to have sun glint removed, perform a linear regression of NIR brightness (x-axis) against the band signal (y-axis) using the selected pixels. The slope of the regression line is the output of interest, for band i, call it bi.

c. To deglint band i for all pixels in the image, subtract the product of bi and the NIR brightness of the pixel (minus MinNIR) from the pixel value in band i, using above equation.

**3) Undertake modified Lyzenga’s multiple linear regression analysis (Lyzenga, Malinas & Tanis 2006), using Sentinel-2 bands 1, 2, 3, and 4.**

D = a + (b1)(R”1) + (b2)(R”2) + (b3)(R”3) + (b4)(R”4) + (b5)(R”5), where D = depth, a is the y-intercept, b is the slope, R” is (R’i- min(R’i)), with i = band number

**4) Repeat above steps across multiple images and bootstrap depth values derived from each image to create mean and 95% confidence intervals.**

**References**

Hedley, J., Harborne, A. & Mumby, P. (2005) Simple and robust removal of sun glint for mapping shallow‐water benthos. *International journal of remote sensing,* **26,** 2107-2112.

Lyzenga, D.R., Malinas, N.P. & Tanis, F.J. (2006) Multispectral bathymetry using a simple physically based algorithm. *IEEE Transactions on Geoscience and Remote Sensing,* **44,** 2251-2259.