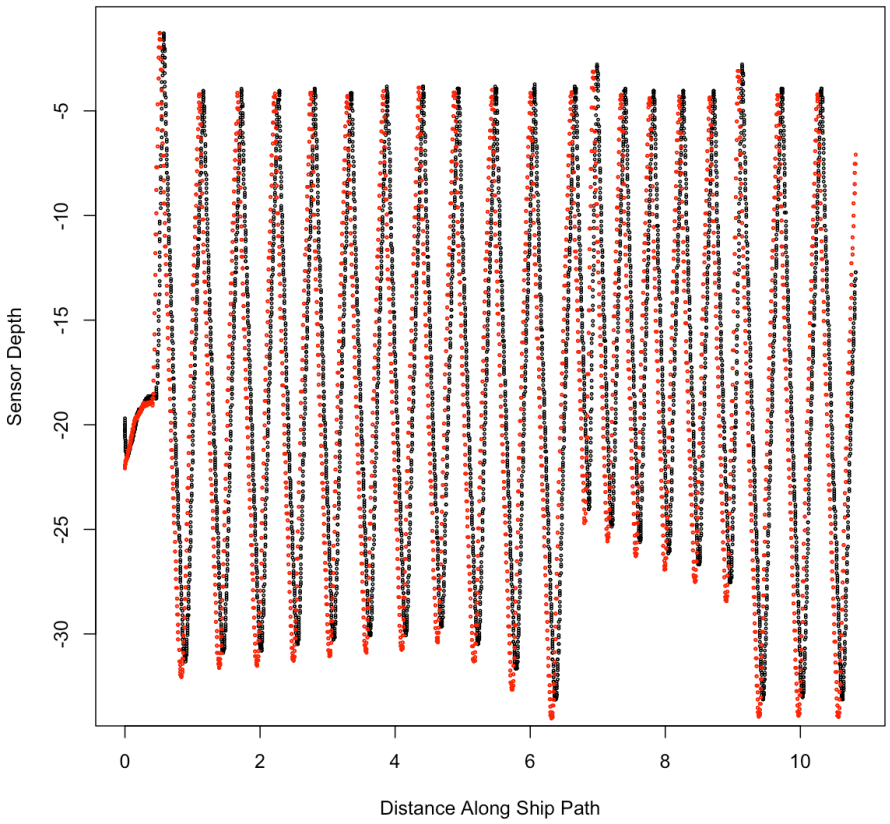
Triaxus Data

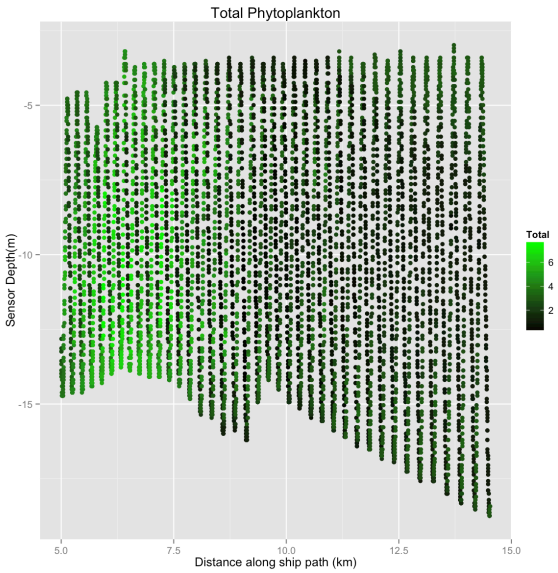
1. Phytoplankton Sensor

Problem: The phytoplankton data isn't arrange properly. Current method for recording phytoplankton data is to record when the data available. The sampling frequencies for different sensors are different, and the sampling frequency for phytoplankton value by Fluoroprobe is lower so



the data is more sparse.

in the figure above, of the same line in excel, the red dot is the depth measured by Fluoroprobe Sensor (Column AO) and the black dot is the depth measured by Seabird Sensor (Column AA). So in the raw data, the Chl-a value is corresponding to the Fluoroprobe depth rather than the Seabird depth but the two depths are not identical.

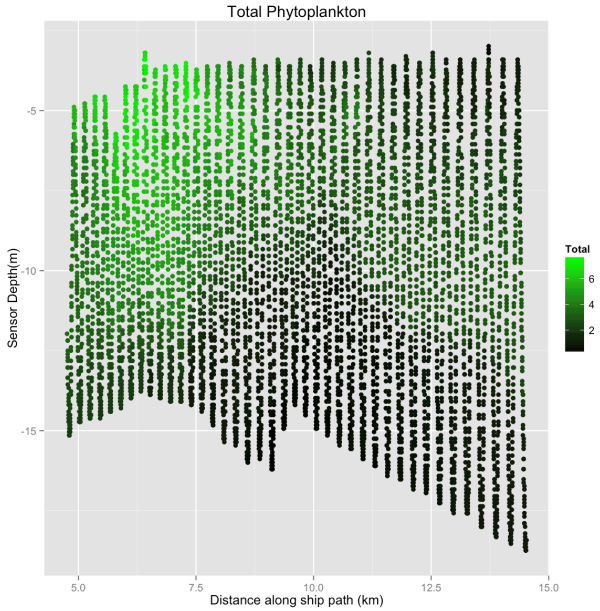


Solve Method:

(1) Identify each undulating cycle for two sensors.

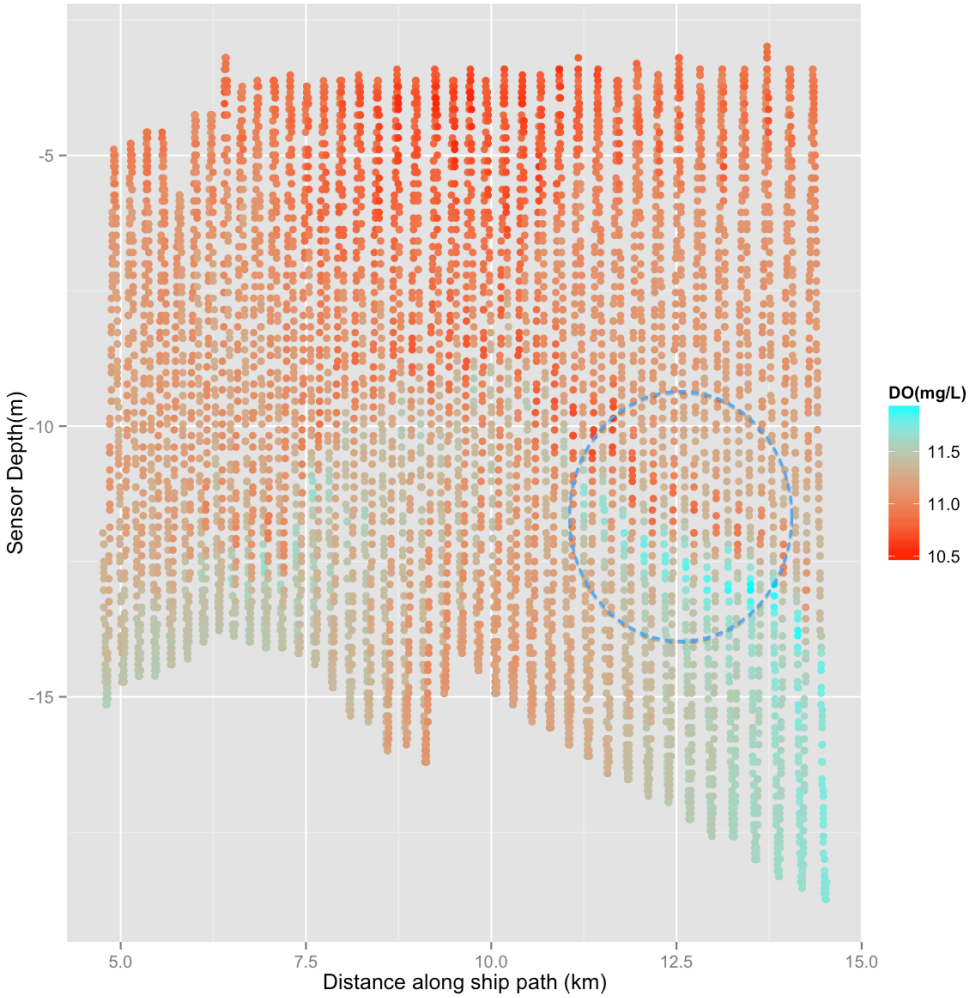
(2) for each same cycle, linear interpolate the phytoplankton value on the seabird sensor depth using sensor depth and corresponding phytoplankton value of the Fluoroprobe.

After linear interpolation, the total Chl-a value with depth and distance will be:



2. Dissolved Oxygen

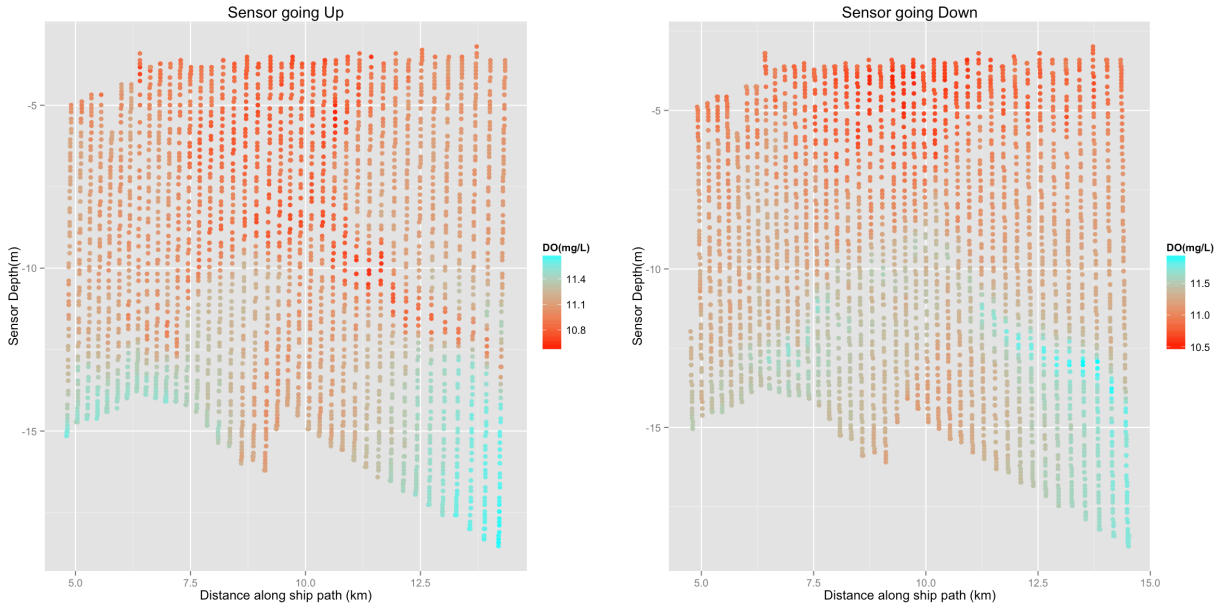
Problem: The dissolved Oxygen has two issues. (1) The very initial unstable data; (2) The data value is not consistent in one cycle.



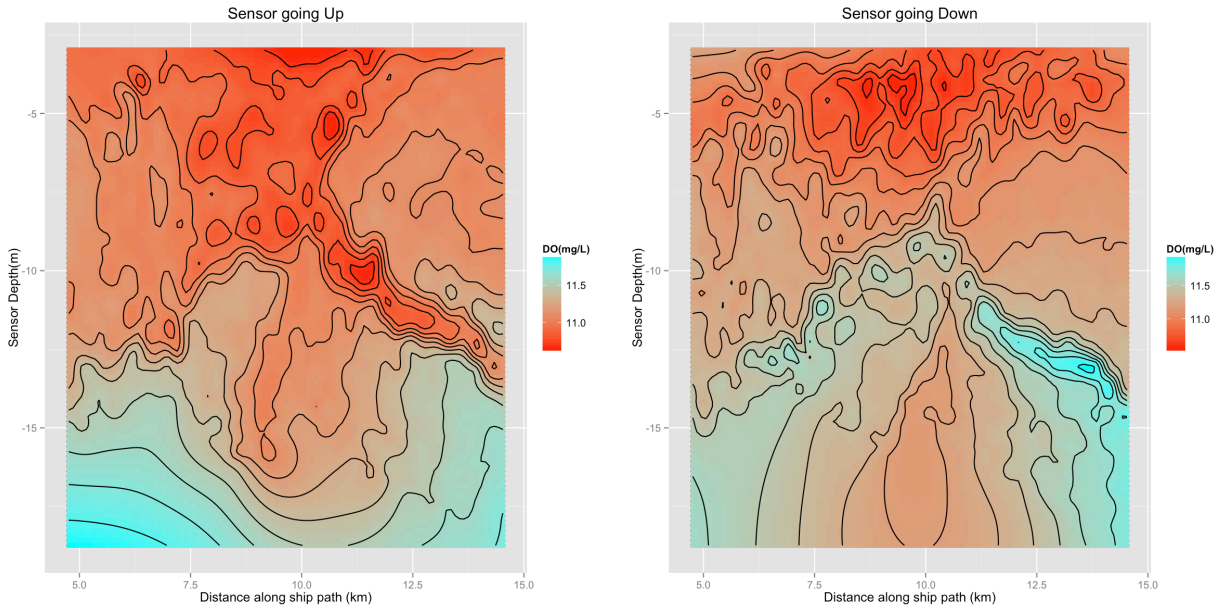
As for the second issue, in one cycle, when the sensor goes up, it will get a lower DO value. When the sensor goes down, it will get a higher DO value. This kind of inconsistence is more significant at the thin layers where temperature and other variables change rapidly.

Solve Method:

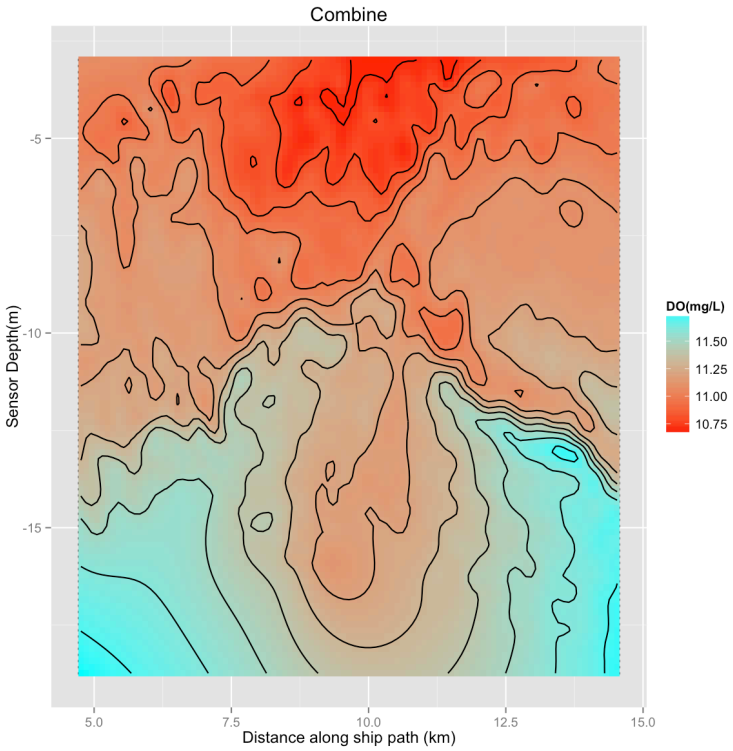
(1) Separate the whole movement into two part. One is the part when the sensor goes up and other is the part when the sensor goes down.



(2) Do interpolation of the two part separately.



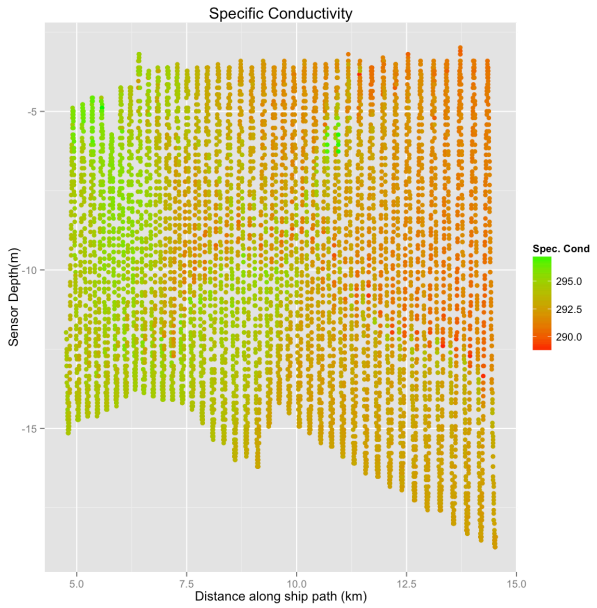
(3) Combine the two interpolation result by doing average.

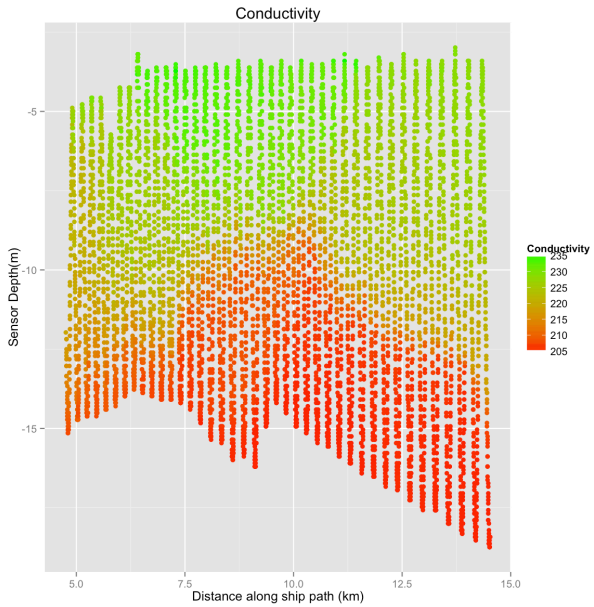


In this way, we can get a smooth DO surface rather than a wave.

3. Specific Conductivity

The Specific conductivity in the excel is calculated based on the Conductivity and the temperature. The specific conductivity also shows a similar pattern as DO values, however, this pattern is not significant in the conductivity.


Specific Conductivity
Sensor Depth(m)
-5
-10
-15
5.0
7.5
10.0
12.5
15.0
Distance along ship path (km)
Spec. Cond
295.0
292.5
290.0


Conductivity
Sensor Depth(m)
-5
-10
-15
5.0
7.5
10.0
12.5
15.0
Distance along ship path (km)
Conductivity
235
230
225
220
215
210
205