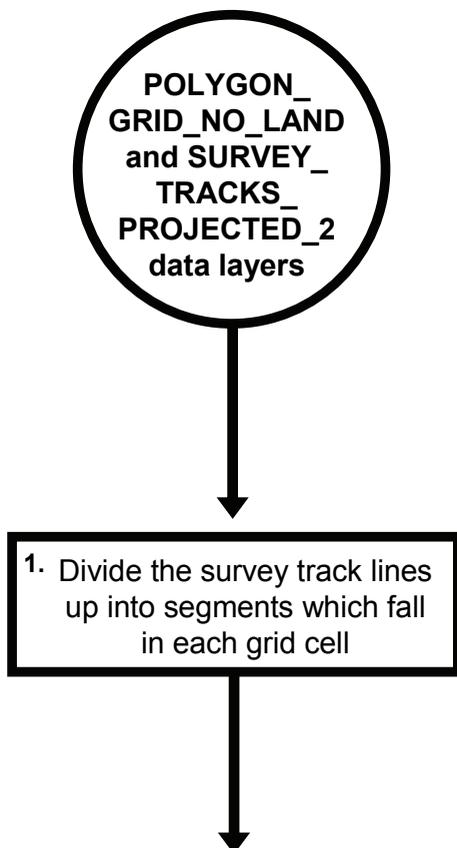


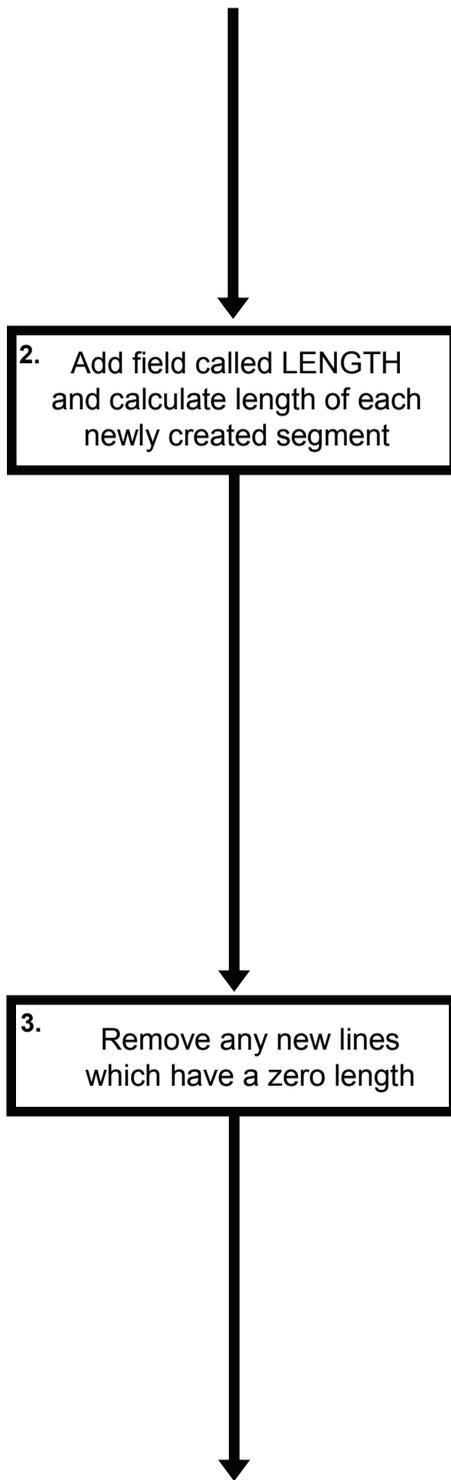
STEP 7: CALCULATE THE LENGTH OF SURVEY TRACKS IN EACH POLYGON GRID CELL:

The next step in this exercise is to divide the survey tracks into sections which fall in each grid cell and then calculate the lengths of all these sections. This is done using the INTERSECT tool as outlined below. Once this has been calculated this information can be joined to the attribute table of the polygon grid data layer using a SPATIAL JOIN.

The instructions for this step are based on instruction sets called *How to split lines or polygons in a data layer into two or more parts*, *How to add information on the length of lines or the area of polygons to the attribute table of a data layer*, *How to remove features from an existing data layer*, *How to join information in the attribute tables of different data layers together based on their spatial relationships (spatial join)* and *How to change the display symbols for a data layer*. The generic versions of these instruction sets can be found on pages 175, 230, 155, 213 and 122 in *An Introduction To Using GIS In Marine Biology*.



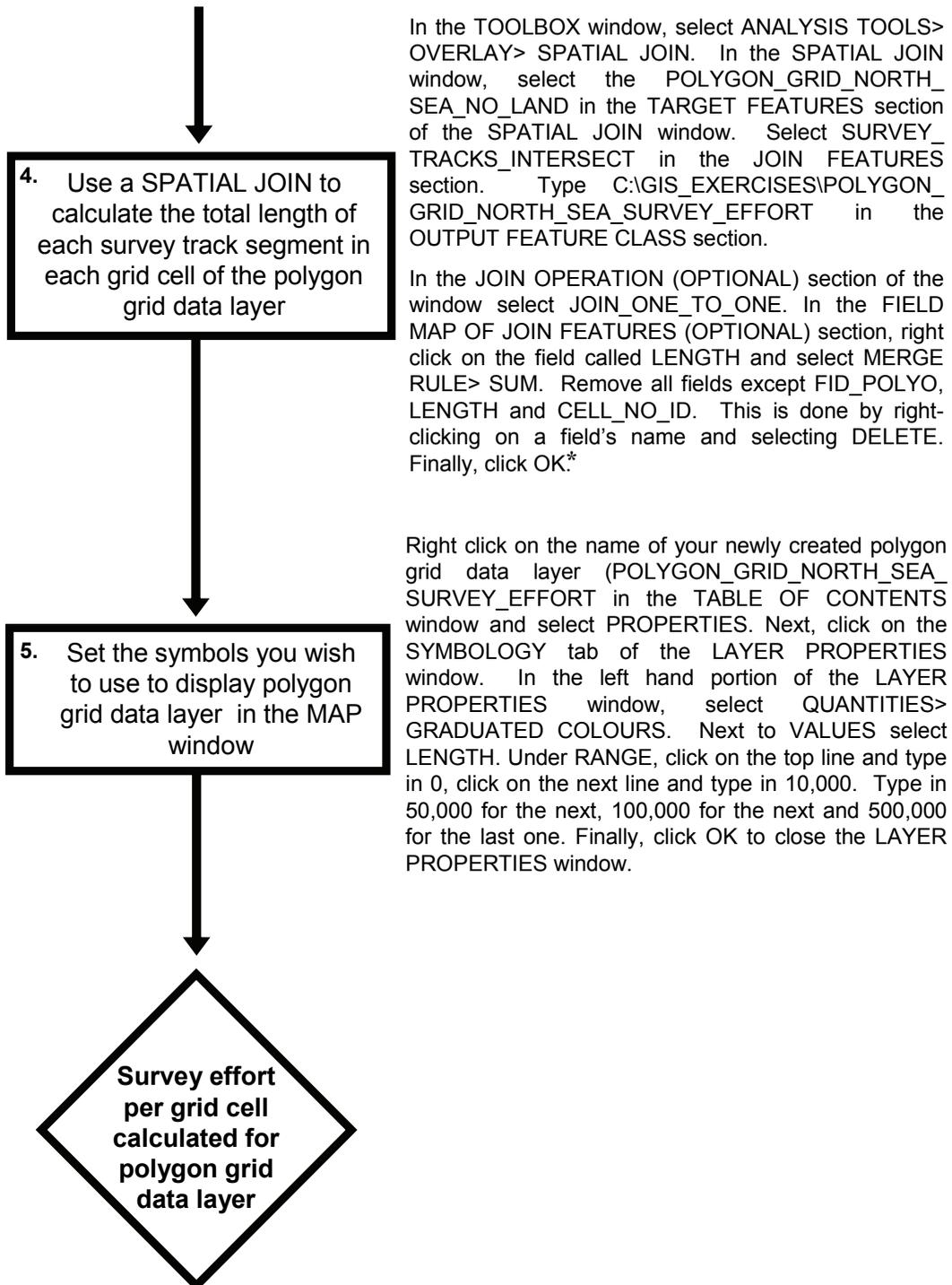
In the TOOLBOX window, select ANALYSIS TOOLS> OVERLAY> INTERSECT. This will open the INTERSECT tool window. In the INTERSECT tool window, select SURVEY_TRACKS_PROJECT_2 from the drop down menu in the INPUT FEATURES section of the window. Once selected, it will appear in the FEATURES section immediately below the INPUT FEATURES section. Repeat this for POLYGON_GRID_NORTH_SEA_NO_LAND. Type C:\GIS_EXERCISES\SURVEY_TRACKS_INTERSECT in the OUTPUT FEATURE CLASS section of the window. In the JOIN ATTRIBUTES section, select ALL from the drop down menu. In the OUTPUT TYPE section, select INPUT from the drop down menu. Finally click OK to close the INTERSECT tool window



Right click on the name SURVEY_TRACKS_INTERSECT the TABLE OF CONTENTS window, and select OPEN ATTRIBUTE TABLE. Click on the OPTIONS button at the bottom right hand corner of the ATTRIBUTE TABLE window and select ADD FIELD. Name the field 'Length', and select SHORT INTEGER for the type. Type in 16 for PRECISION. Now click OK. Next, right-click field name LENGTH in the ATTRIBUTE TABLE window and select CALCULATE GEOMETRY. If a window appears warning you that you are editing a data layer outside of an edit session, click YES, and carry on. If this window does not appear, this is OK. In the CALCULATE GEOMETRY window, for PROPERTIES select LENGTH. For COORDINATE SYSTEM select USE COORDINATE SYSTEM OF THE DATA SOURCE. In UNITS select the METRES. Click OK.

You now want to remove any line features from the data layer which have a zero length. To do this, go to SELECTION on the main menu bar and select SELECT BY ATTRIBUTES. In the SELECT BY ATTRIBUTES window, select SURVEY_TRACKS_INTERSECT for LAYER and CREATE A NEW SELECTION for METHOD. Double click on the field name LENGTH to add it to the lower window. Now click on the equals (=) sign to add it to the lower window before typing in a space followed by the number zero (0). This will result in the expression "LENGTH" = 0 appearing in the lower window. Now click OK.

On the EDITOR tool bar, click the EDITOR button and select START EDITING. If the START EDITING window, for SOURCE select C:\GIS_EXERCISES\ and click OK. If another window appears, select SURVEY_TRACKS_INTERSECT and click on START EDITING. If the START EDITING window does not appear, this is OK and you can just carry on. Next, click on EDIT on the main menu bar and select DELETE. Click on the EDITOR button on the EDITOR tool bar again and select STOP EDITING. When the SAVE window opens click on YES to save the edits.



*If applying these instructions to your own data set, in some cases, you may also have to scroll down in the SPATIAL JOIN window and change the MATCH OPTION (OPTIONAL) setting to CONTAINS rather than INTERSECTS. If you do not do this, you may find that your total amount of survey effort becomes inflated. You can check which option you should use by picking an individual polygon grid cell and measuring the length of the survey effort in it using the measure tool and comparing this to the result generated for the same cell during the spatial join. If there is a substantial difference, repeat the spatial join but change the MATCH OPTION (OPTIONAL) setting to CONTAINS. Once the spatial join has been repeated, check the result again to ensure that you have the correct result.