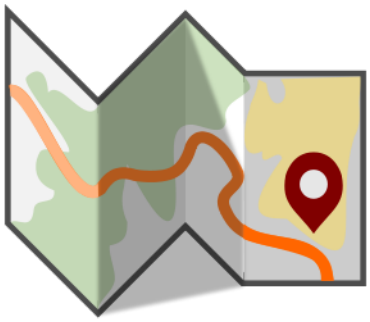
Basic Vector Styling

QGIS Tutorials and Tips



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基本向量資料樣式設定

為了讓地圖能夠清楚呈現資訊，GIS 資料的樣式必須要好好設定。在 QGIS 中，有許多選項可以讓使用者以不同的風格與符號呈現原始資料。在本教學中，我們就來看一些基本的樣式設定技巧。

內容說明

設定「世界各國的人口預期壽命」向量圖層的樣式。

■■■■■■■

- 查看向量圖層的屬性表格。

取得資料

這次使用的資料是 University of Wisconsin-Madison 附屬的機構 Center for Sustainability and the Global Environment (SAGE)。

你可以從 Human Impact Dataset 中下載 Life Expectancy GIS Grid data。

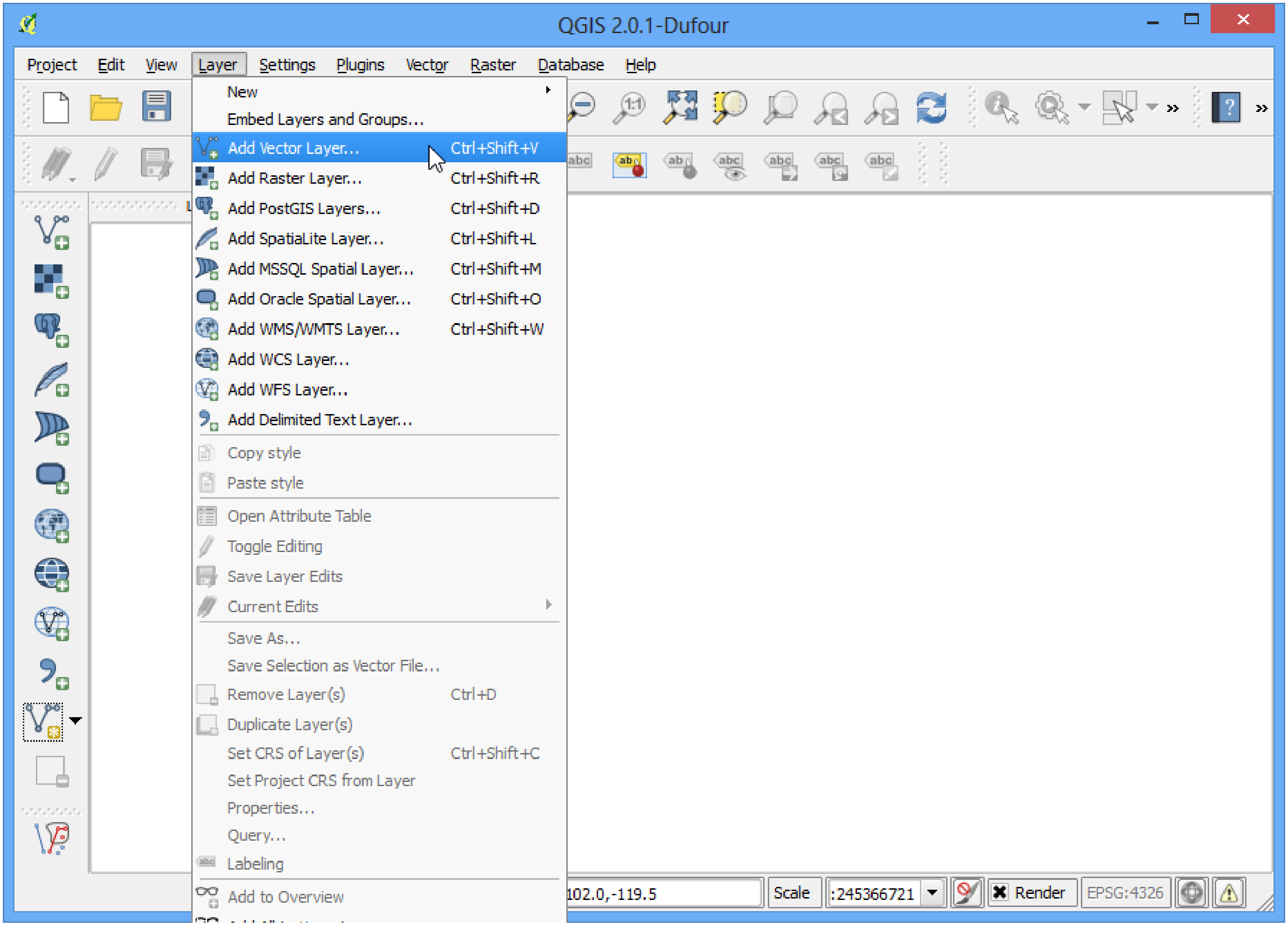
為了方便起見，你也可以直接用下面的連結下載：

lifeexpectancy.zip

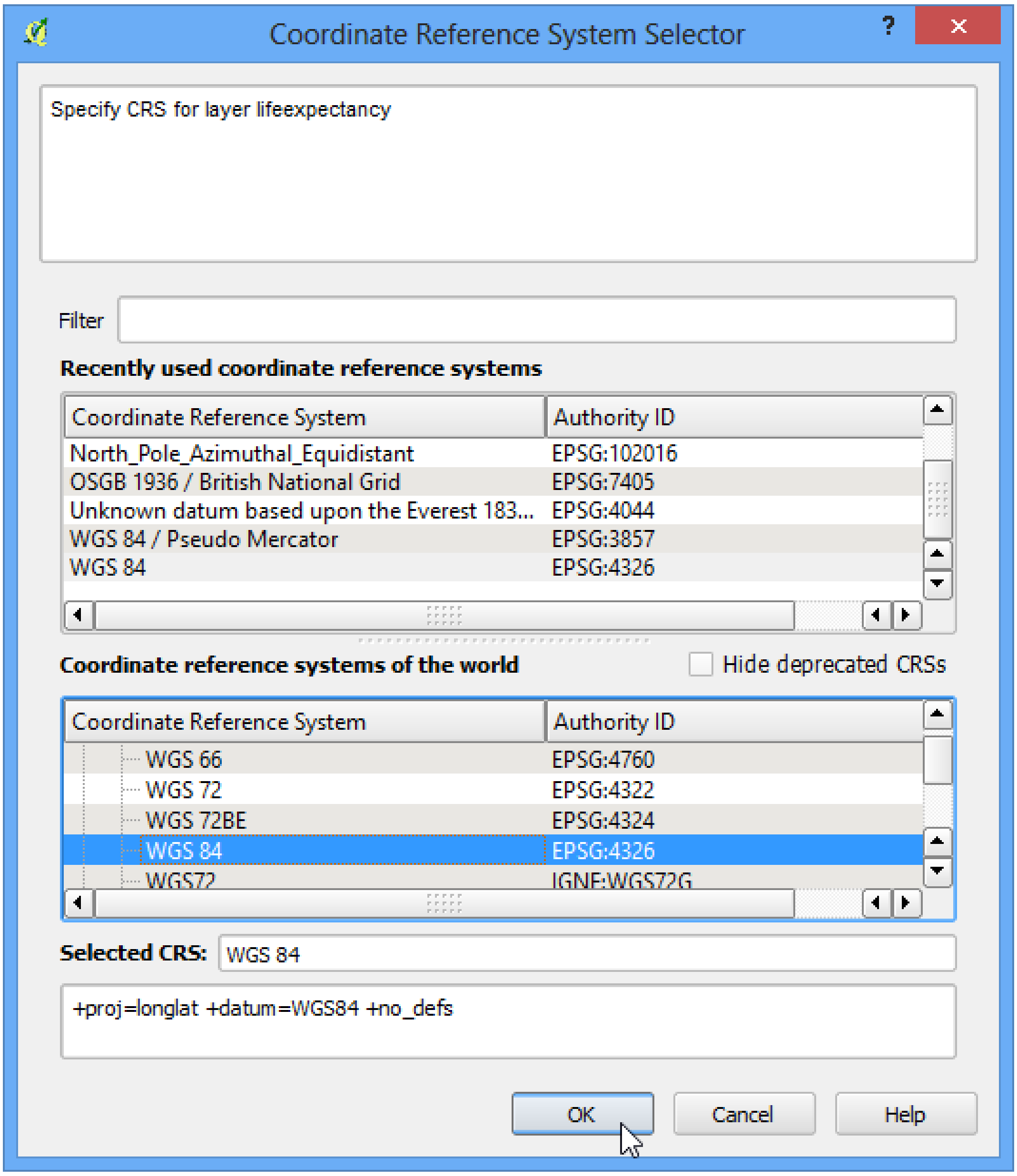
資料來源 [SAGE]

操作流程

1. 打開 QGIS，選擇 圖層 ‣ 加入向量圖層。


QGIS 2.0.1-Dufour
Project
Edit
View
Layer
Settings
Plugins
Vector
Raster
Database
Help
New
Embed Layers and Groups...
Add Vector Layer... Ctrl+Shift+V
Add Raster Layer... Ctrl+Shift+R
Add PostGIS Layers... Ctrl+Shift+D
Add SpatiaLite Layer... Ctrl+Shift+L
Add MSSQL Spatial Layer... Ctrl+Shift+M
Add Oracle Spatial Layer... Ctrl+Shift+O
Add WMS/WMTS Layer... Ctrl+Shift+W
Add WCS Layer...
Add WFS Layer...
Add Delimited Text Layer...
Copy style
Paste style
Open Attribute Table
Toggle Editing
Save Layer Edits
Current Edits
Save As...
Save Selection as Vector File...
Remove Layer(s) Ctrl+D
Duplicate Layer(s)
Set CRS of Layer(s) Ctrl+Shift+C
Set Project CRS from Layer
Properties...
Query...
Labeling
Add to Overview
102.0,-119.5
Scale
:245366721
Render
EPSG:4326

2. 找到剛下載的 ***lifeexpectancy.zip*** 後，按下 開啟。內含的 shapefile 叫做 ***newsweek_data.shp***。接下來要為資料選一個座標參考系統（CRS），這邊選 ***WGS84 EPSG:4326*** 當作 CRS 即可。



Coordinate Reference System Selector

Specify CRS for layer lifeexpectancy

Filter

Recently used coordinate reference systems

Coordinate Reference System	Authority ID
North_Pole_Azimuthal_Equidistant	EPSG:102016
OSGB 1936 / British National Grid	EPSG:7405
Unknown datum based upon the Everest 183...	EPSG:4044
WGS 84 / Pseudo Mercator	EPSG:3857
WGS 84	EPSG:4326

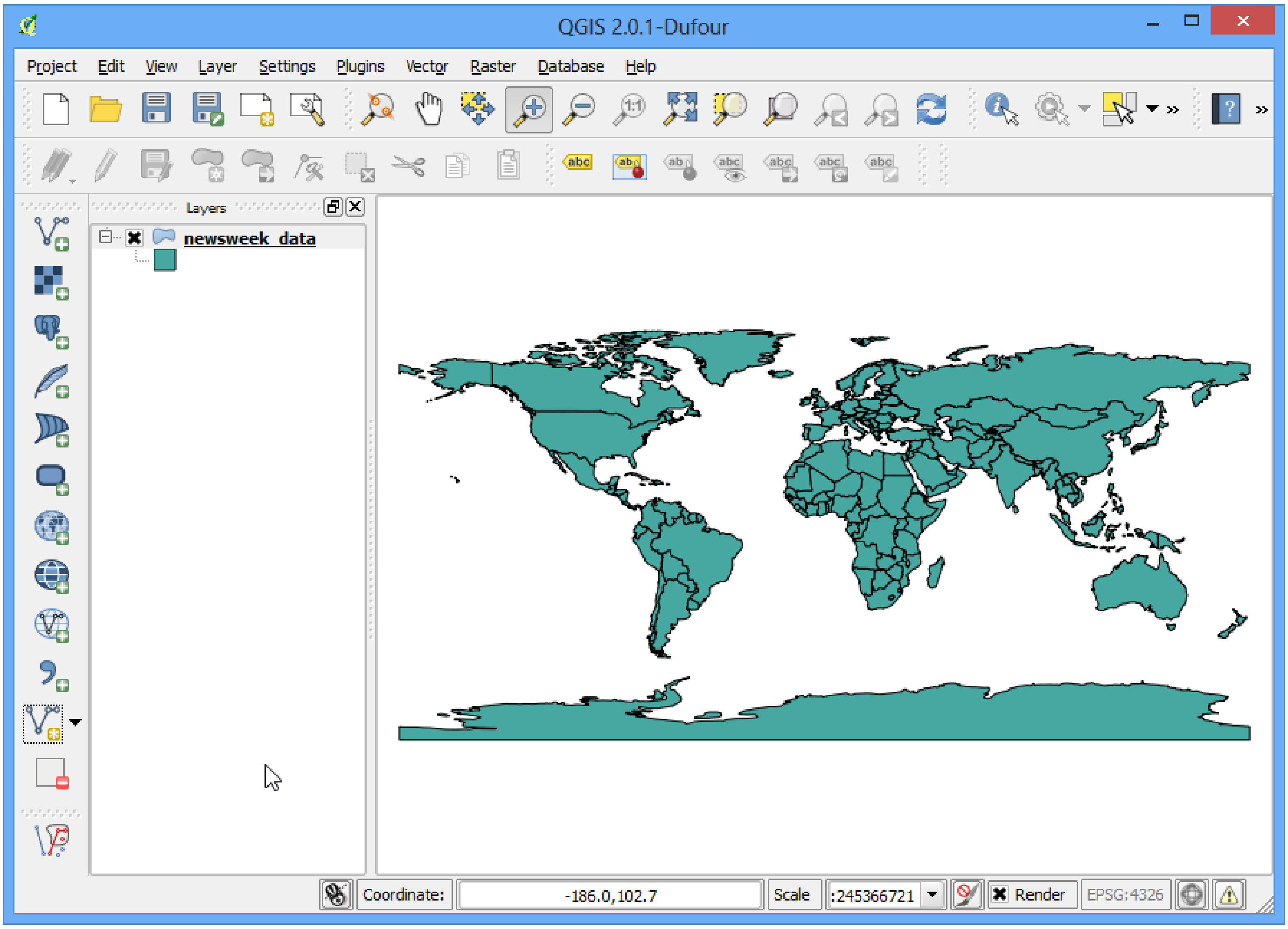
Coordinate reference systems of the world ☐ Hide deprecated CRSs

Coordinate Reference System	Authority ID
WGS 66	EPSG:4760
WGS 72	EPSG:4322
WGS 72BE	EPSG:4324
WGS 84	EPSG:4326
WGS72	IGNF:WGS72G

Selected CRS: WGS 84

+proj=longlat +datum=WGS84 +no_defs

3. 這樣一來在壓縮檔內的 shapefile 就可以呈現在畫面上，目前它使用的是預設的樣式設定。


QGIS 2.0.1-Dufour
Project
Edit
View
Layer
Settings
Plugins
Vector
Raster
Database
Help
Layers
Render

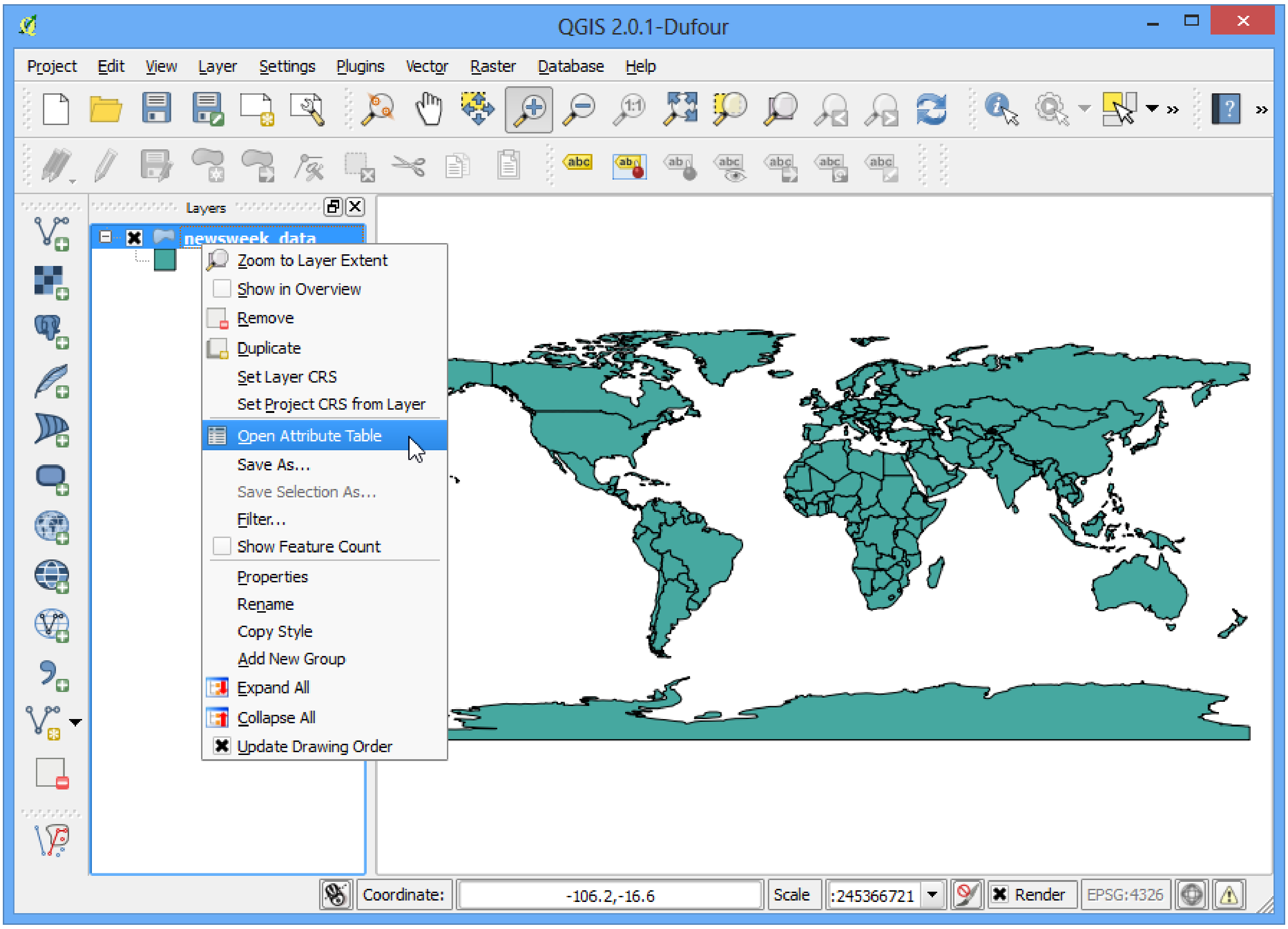
☒ newsweek_data

Coordinate: -186.0,102.7

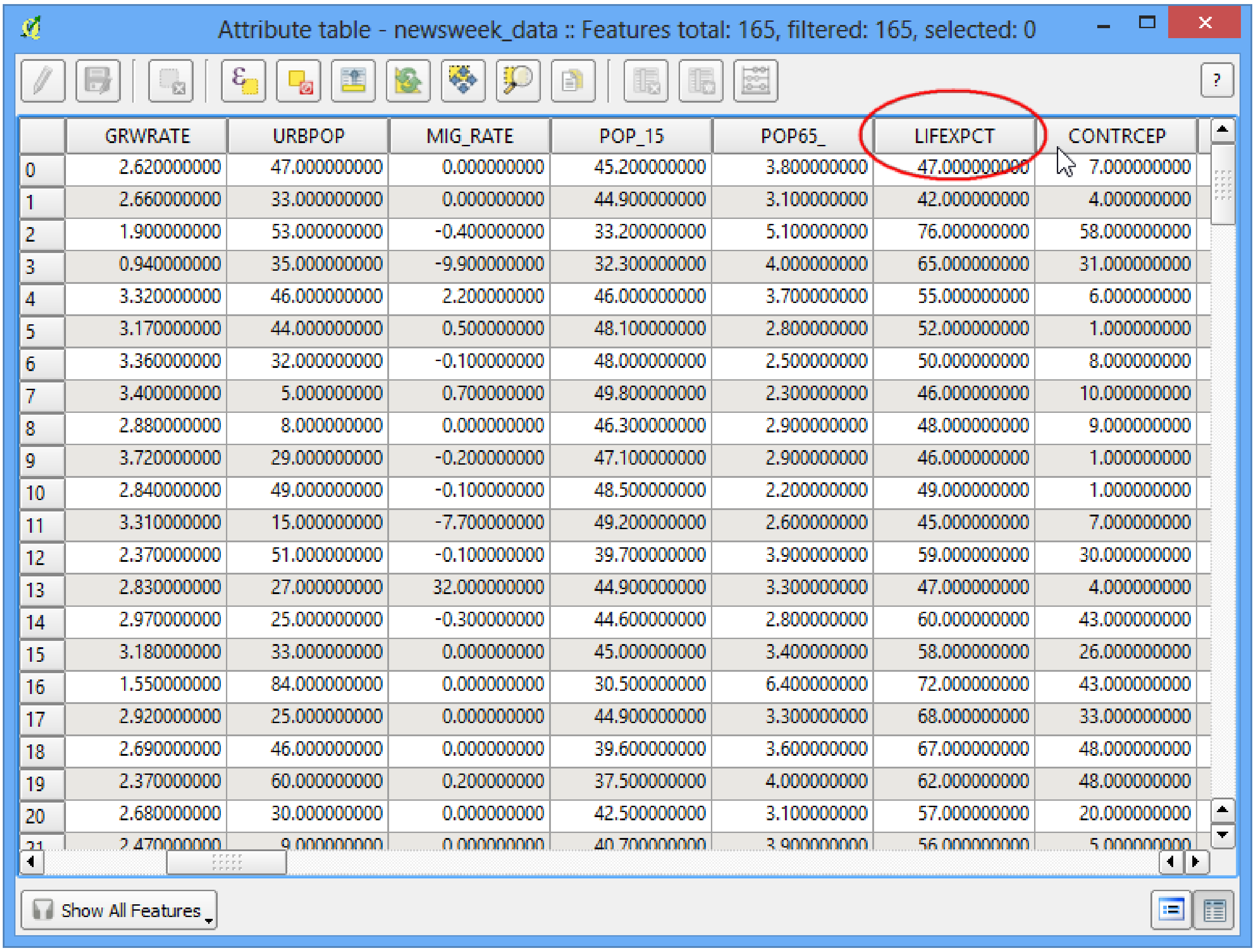
Scale :245366721

EPSG:4326

4. 在這個圖層上按右鍵，選擇 開啟屬性表格，


QGIS 2.0.1-Dufour
Project
Edit
View
Layer
Settings
Plugins
Vector
Raster
Database
Help
Layers
newsweek_data
Zoom to Layer Extent
Show in Overview
Remove
Duplicate
Set Layer CRS
Set Project CRS from Layer
Open Attribute Table
Save As...
Save Selection As...
Filter...
Show Feature Count
Properties
Rename
Copy Style
Add New Group
Expand All
Collapse All
Update Drawing Order
Coordinate:
-106.2,-16.6
Scale
:245366721
Render
EPSG:4326

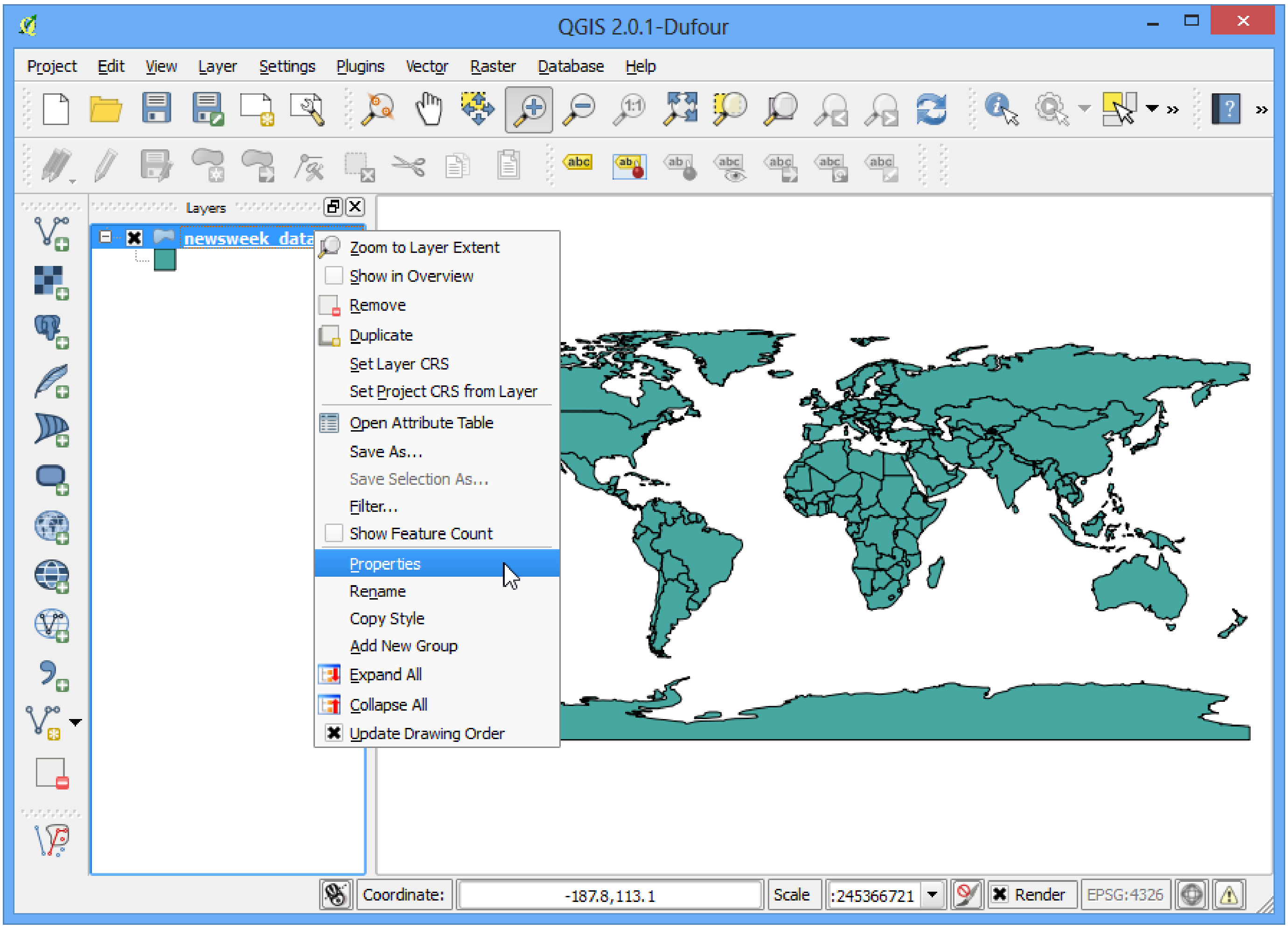
5. 看一下這筆資料有哪些屬性。在眾多的屬性欄位中，只能挑一個做為地圖呈現，考慮到我們的目標是要秀出人口預期壽命（life expectancy，指平均來說這個國家的人可以活到多老）的差異，要看的欄位很自然的就是 LIFEXPECT。



Attribute table - newsweek_data :: Features total: 165, filtered: 165, selected: 0

	GRWRATE	URBPOP	MIG_RATE	POP_15	POP65_	LIFEXPCT	CONTRCEP
0	2.620000000	47.000000000	0.000000000	45.200000000	3.800000000	47.000000000	7.000000000
1	2.660000000	33.000000000	0.000000000	44.900000000	3.100000000	42.000000000	4.000000000
2	1.900000000	53.000000000	-0.400000000	33.200000000	5.100000000	76.000000000	58.000000000
3	0.940000000	35.000000000	-9.900000000	32.300000000	4.000000000	65.000000000	31.000000000
4	3.320000000	46.000000000	2.200000000	46.000000000	3.700000000	55.000000000	6.000000000
5	3.170000000	44.000000000	0.500000000	48.100000000	2.800000000	52.000000000	1.000000000
6	3.360000000	32.000000000	-0.100000000	48.000000000	2.500000000	50.000000000	8.000000000
7	3.400000000	5.000000000	0.700000000	49.800000000	2.300000000	46.000000000	10.000000000
8	2.880000000	8.000000000	0.000000000	46.300000000	2.900000000	48.000000000	9.000000000
9	3.720000000	29.000000000	-0.200000000	47.100000000	2.900000000	46.000000000	1.000000000
10	2.840000000	49.000000000	-0.100000000	48.500000000	2.200000000	49.000000000	1.000000000
11	3.310000000	15.000000000	-7.700000000	49.200000000	2.600000000	45.000000000	7.000000000
12	2.370000000	51.000000000	-0.100000000	39.700000000	3.900000000	59.000000000	30.000000000
13	2.830000000	27.000000000	32.000000000	44.900000000	3.300000000	47.000000000	4.000000000
14	2.970000000	25.000000000	-0.300000000	44.600000000	2.800000000	60.000000000	43.000000000
15	3.180000000	33.000000000	0.000000000	45.000000000	3.400000000	58.000000000	26.000000000
16	1.550000000	84.000000000	0.000000000	30.500000000	6.400000000	72.000000000	43.000000000
17	2.920000000	25.000000000	0.000000000	44.900000000	3.300000000	68.000000000	33.000000000
18	2.690000000	46.000000000	0.000000000	39.600000000	3.600000000	67.000000000	48.000000000
19	2.370000000	60.000000000	0.200000000	37.500000000	4.000000000	62.000000000	48.000000000
20	2.680000000	30.000000000	0.000000000	42.500000000	3.100000000	57.000000000	20.000000000
21	2.470000000	9.000000000	0.000000000	40.700000000	3.900000000	56.000000000	5.000000000

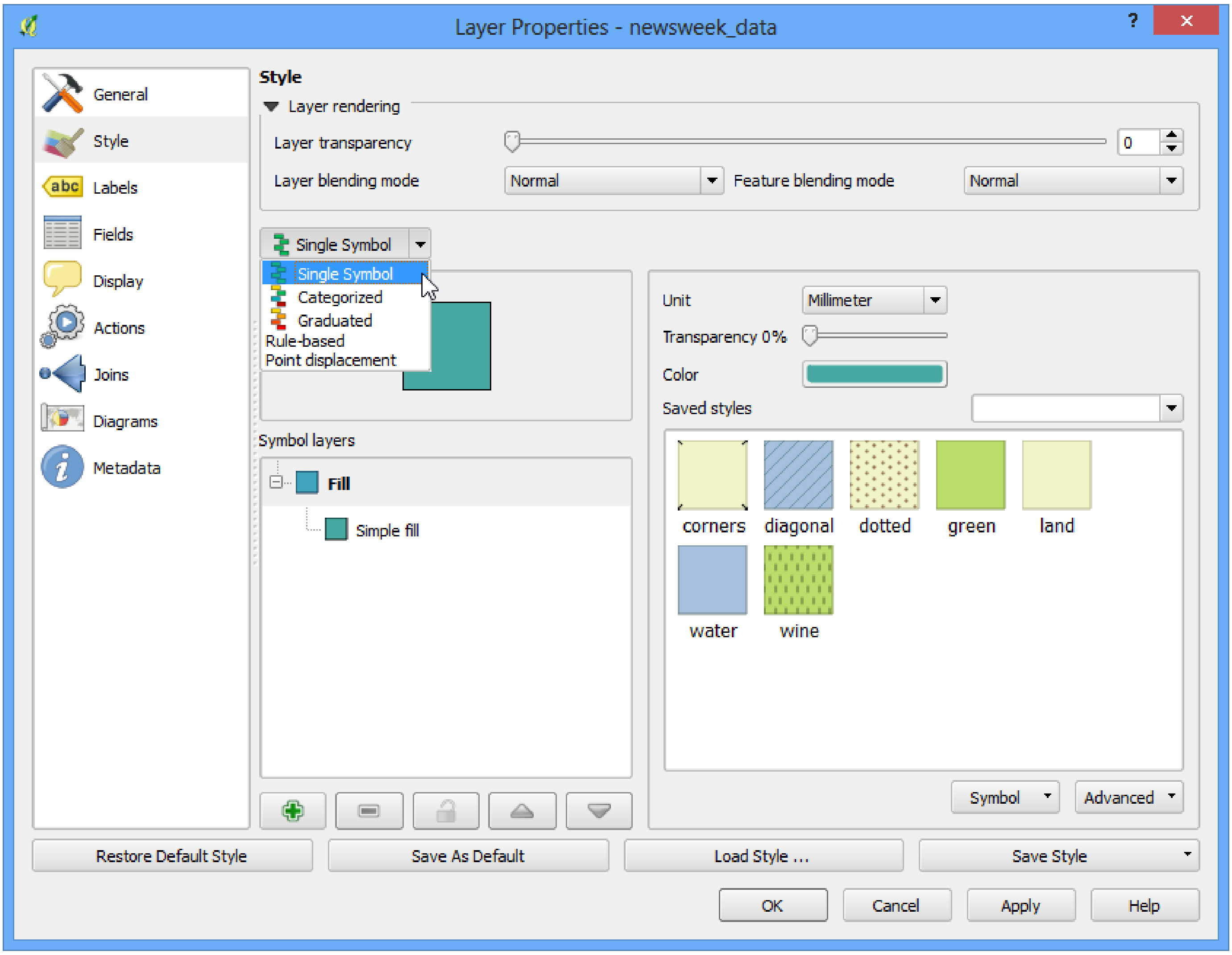
6. 關掉屬性表格，然後在這個圖層上按右鍵，選擇 屬性。'


QGIS 2.0.1-Dufour
Project
Edit
View
Layer
Settings
Plugins
Vector
Raster
Database
Help
Layers
newsweek_data
Zoom to Layer Extent
Show in Overview
Remove
Duplicate
Set Layer CRS
Set Project CRS from Layer
Open Attribute Table
Save As...
Save Selection As...
Filter...
Show Feature Count
Properties
Rename
Copy Style
Add New Group
Expand All
Collapse All
Update Drawing Order
Render
EPSG:4326

Coordinate: -187.8,113.1

Scale :245366721

7. 許多樣式調整的選項都放在屬性視窗的 樣式 分頁中。按一下分頁上的那個下拉選單，可以看到有許多選項可以使用，像是單一符號、類別、漸層、規則、點位移 等等。這裡我們只會用前三個選項來示範樣式設定。


Layer Properties - newsweek_data
?
×
General
Style
Labels
Fields
Display
Actions
Joins
Diagrams
Metadata
Style
Layer rendering
Single Symbol
Single Symbol
Categorized
Graduated
Rule-based
Point displacement
Color
Saved styles
corners
diagonal
dotted
green
land
water
wine
Symbol layers
Fill
Simple fill
Symbol
Advanced
Restore Default Style
Save As Default
Load Style ...
Save Style
OK
Cancel
Apply
Help

Layer transparency 0

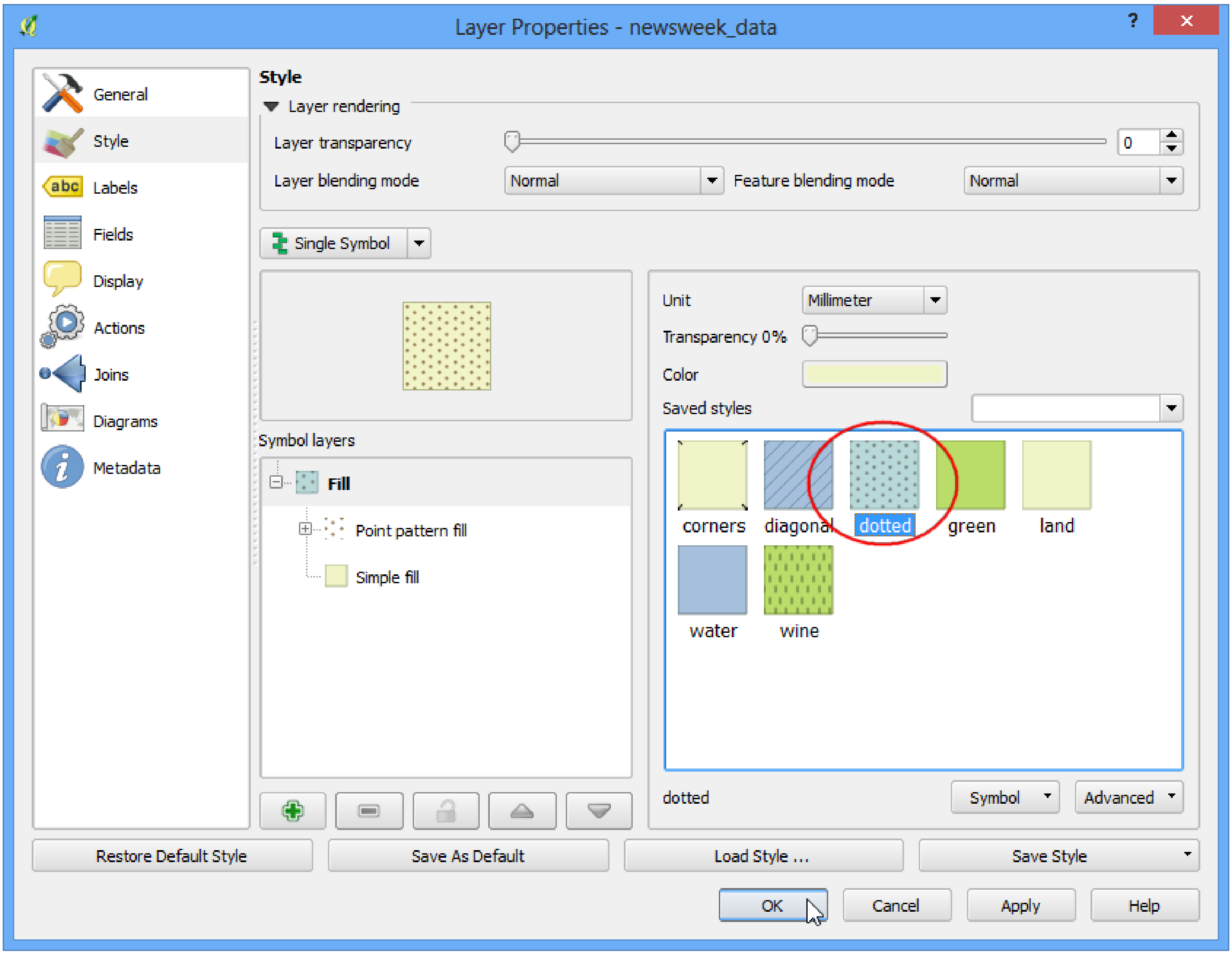
Layer blending mode Normal

Feature blending mode Normal

Unit Millimeter

Transparency 0%

8. 選擇
單一符號，這個選項是針對所有圖層裡的圖徵統一調整樣式。由於我們的資料屬於多邊形的結構，所以有兩個樣式基本部位可以調，一個就是 ■■■■，另一個則是 ■■■■■■■。這裡我們先選看看 dotted 的填滿圖樣，然後按下 確定。



Layer Properties - newsweek_data
General
Style
Labels
Fields
Display
Actions
Joins
Diagrams
Metadata
Symbol layers
Fill
Point pattern fill
Simple fill
Color
Saved styles
corners
diagonal
dotted
green
land
water
wine
Symbol
Advanced
Restore Default Style
Save As Default
Load Style ...
Save Style
OK
Cancel
Apply
Help

Style

Layer rendering

Layer transparency 0

Layer blending mode Normal

Feature blending mode Normal

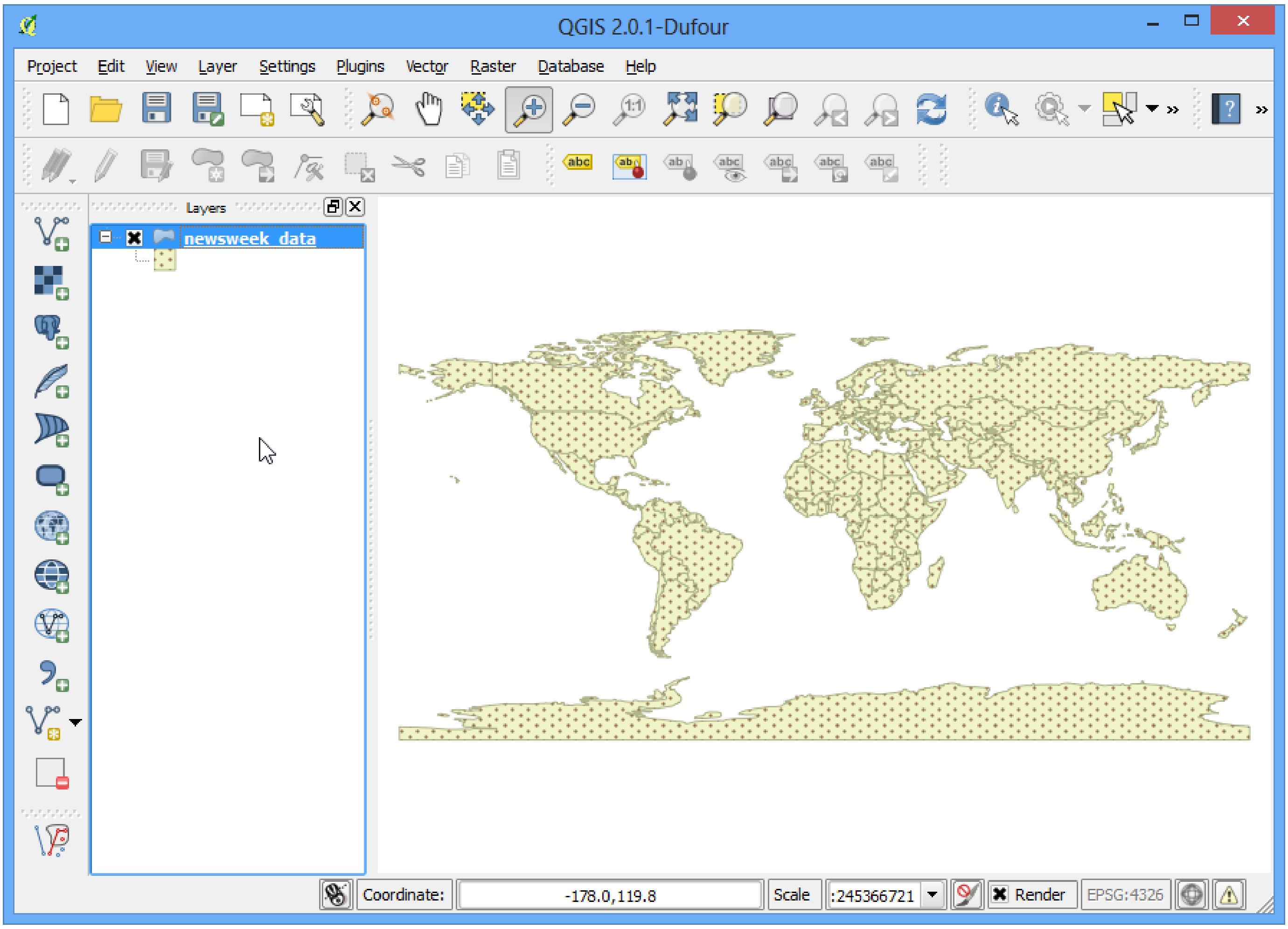
Single Symbol

Unit Millimeter

Transparency 0%

dotted

9. 這下子圖層中所有的多邊形都會被選擇的新樣式給填滿。



QGIS 2.0.1-Dufour
Project
Edit
View
Layer
Settings
Plugins
Vector
Raster
Database
Help
Layers

newsweek_data

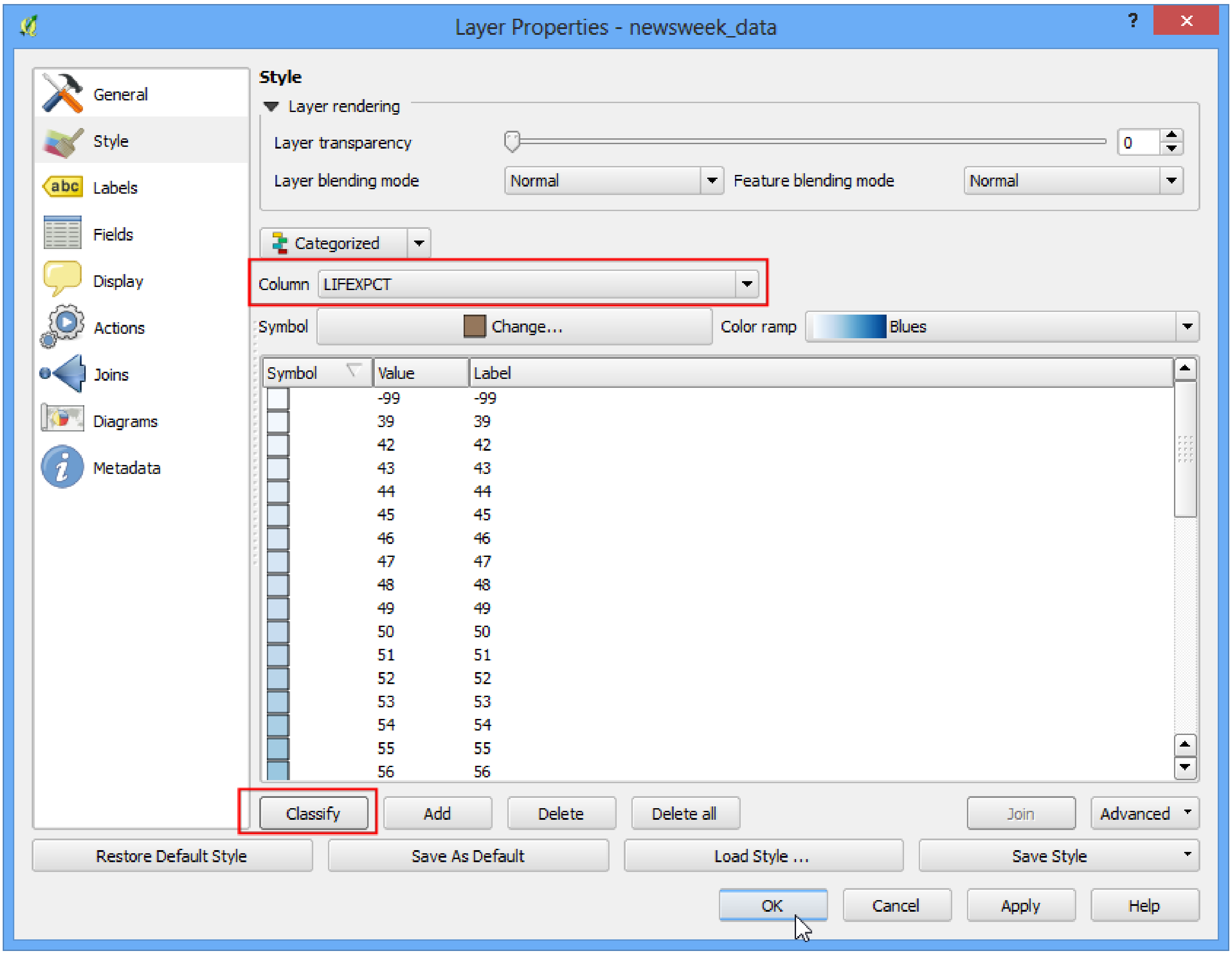
Coordinate: -178.0,119.8

Scale :245366721

☒ Render

EPSG:4326

10. 很顯然的，「單一符號」並不適合呈現預期壽命的資料，我們試試看別種吧。再次按右鍵進到這個圖層的 屬性，然後在 樣式 分頁中選擇「類別」的選項。這個選項會把具有不同屬性值的圖徵，用不同深淺的顏色來顯現。在「行」的那個地方選擇 :guilabel:`LIFEXPECT，然後在 色彩映射表 中選擇一個你喜歡的色條，接著按下 分類 按鈕，最後按下 確定。


Layer Properties - newsweek_data
General
Style
Labels
Fields
Display
Actions
Joins
Diagrams
Metadata
Style
Layer rendering
Change…
Classify
Add
Delete
Delete all
Join
Advanced
Restore Default Style
Save As Default
Load Style …
Save Style
OK
Cancel
Apply
Help

Layer transparency 0

Layer blending mode Normal

Feature blending mode Normal

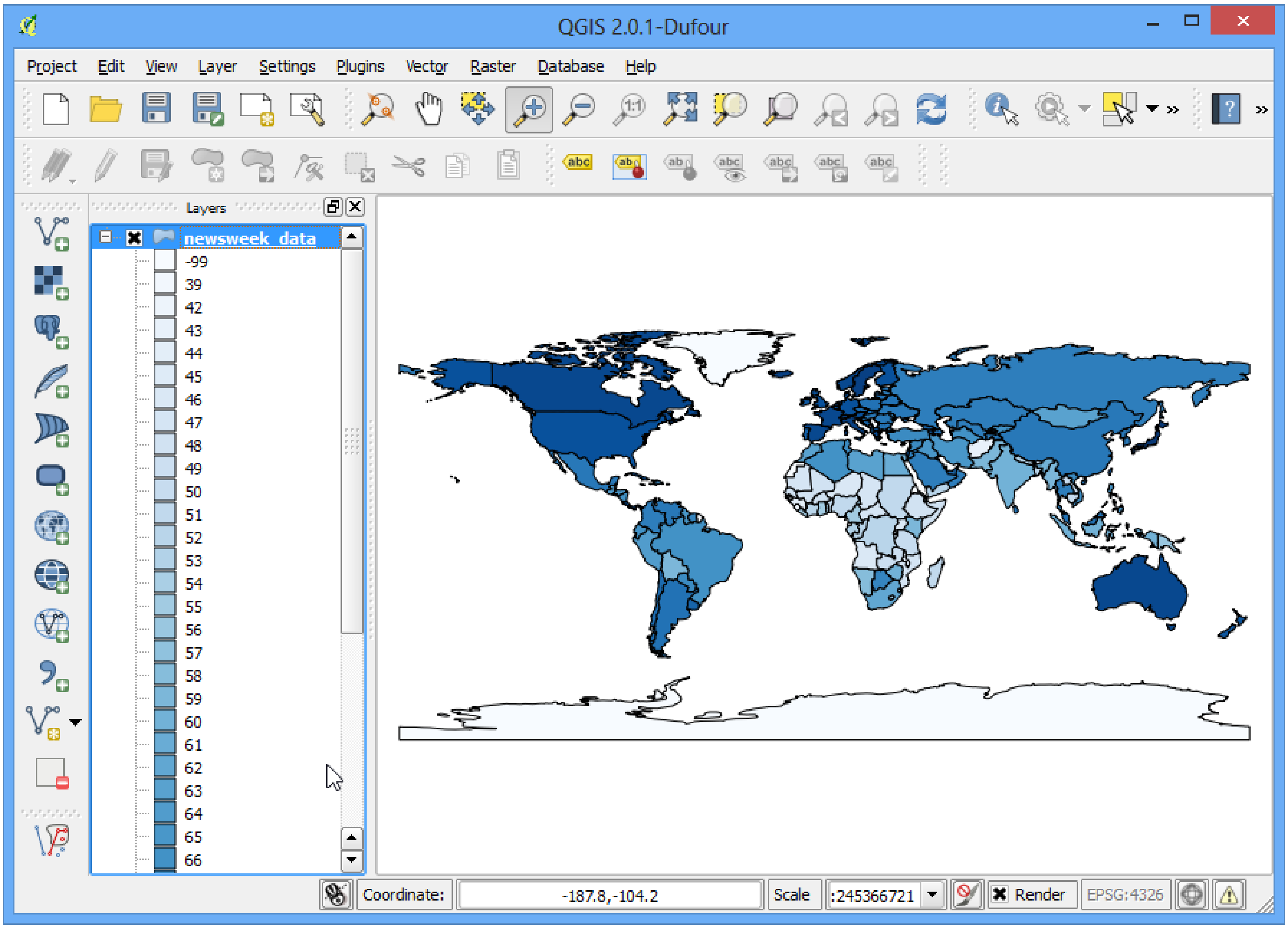
Categorized

Column LIFEXPCT

Color ramp Blues

Symbol	Value	Label
🟦	-99	-99
🟦	39	39
🟦	42	42
🟦	43	43
🟦	44	44
🟦	45	45
🟦	46	46
🟦	47	47
🟦	48	48
🟦	49	49
🟦	50	50
🟦	51	51
🟦	52	52
🟦	53	53
🟦	54	54
🟦	55	55
🟦	56	56

不一的藍色。圖中淺色代表較低的預期壽命，深色則代表較高的預期壽命。這種方法有用多了，例如說我們可以得知預期壽命在開發中國家和已開發國


QGIS 2.0.1-Dufour
Project
Edit
View
Layer
Settings
Plugins
Vector
Raster
Database
Help
Layers
newsweek_data
-99
39
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
Coordinate:
-187.8,-104.2
Scale
:245366721
Render
EPSG:4326

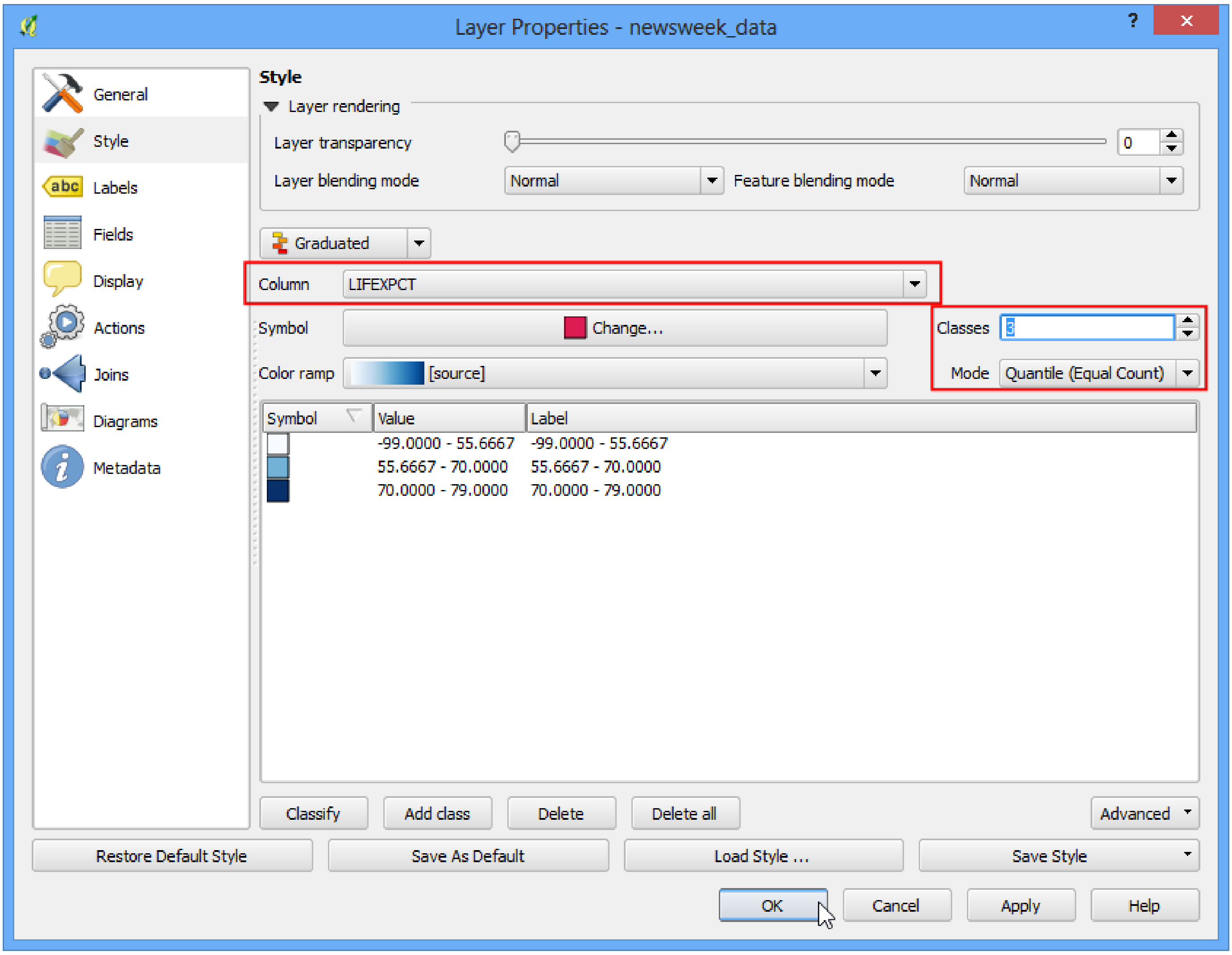
12. 接下來來看看 樣式 分頁中的「 漸層」選項。漸層樣式設定可以把資料依照某個屬性分成許多的類別，每個類別可以有不同的樣式設定。假設我們想把資料分成三個類別：■、■、■，那麼可以在 行 的地方填上 LIFEXPECT，然後在 類別 的地方選擇 3。你會看到有很多不同的 模式 可以選擇，來稍微了解一下好了：這裡總共有 5 種模式，分別為 等距、分位數、自然間斷法臨界值法 (Jenks)、標準差 和 Pretty 間斷法。不同的模式使用不同的統計演算法來把資料分到不同類別中。

- 等距：如其名，每個類別都具有相等的數值範圍。如果資料是從 0-100 然後被分成 10 個類別，那麼每個類別的數值範圍就是 0-10，10-20，20-30 等等，每個類別的大小都是 10 單位。
- 分位數：每個類別都具有相等的資料個數。如果資料有 100 筆然後被分成 4 個類別，那麼每個類別會有 25 筆資料。
- 自然間斷法臨界值法 (Jenks)：此演算法會尋找最自然的數值群組來建立類別。同一類別中的資料集合具有最小化的標準差，
- 標準差：計算資料的平均值與標準差，然後以平均值加減標準差的倍數來做分類。
- Pretty 間斷法：這是基於 R 語言中的 Pretty 演算法發展而來。真要說起來有點複雜，不過基本上會叫做 Pretty 的原因，是它的分類結果會把類別邊界放在捨位過的數字上。

在這裡我們先選簡單的「分位數」法。按下後 分類 以後應該就可以看到有 3 個類別出現，也可以看到類別的邊界值。最後按下 確定。

Note

漸層
選項要求進行分析的欄位一定得是數值資料。欄位屬性是整數或是浮點數都可以，不過如果是字串的話，是沒辦法使用這個選項的。


Layer Properties - newsweek_data
General
Style
Labels
Fields
Display
Actions
Joins
Diagrams
Metadata
Change...
Classify
Add class
Delete
Delete all
Advanced
Restore Default Style
Save As Default
Load Style ...
Save Style
OK
Cancel
Apply
Help

Style

Layer rendering

Layer transparency: 0

Layer blending mode: Normal

Feature blending mode: Normal

Graduated

Column: LIFEXPCT

Symbol: Change...

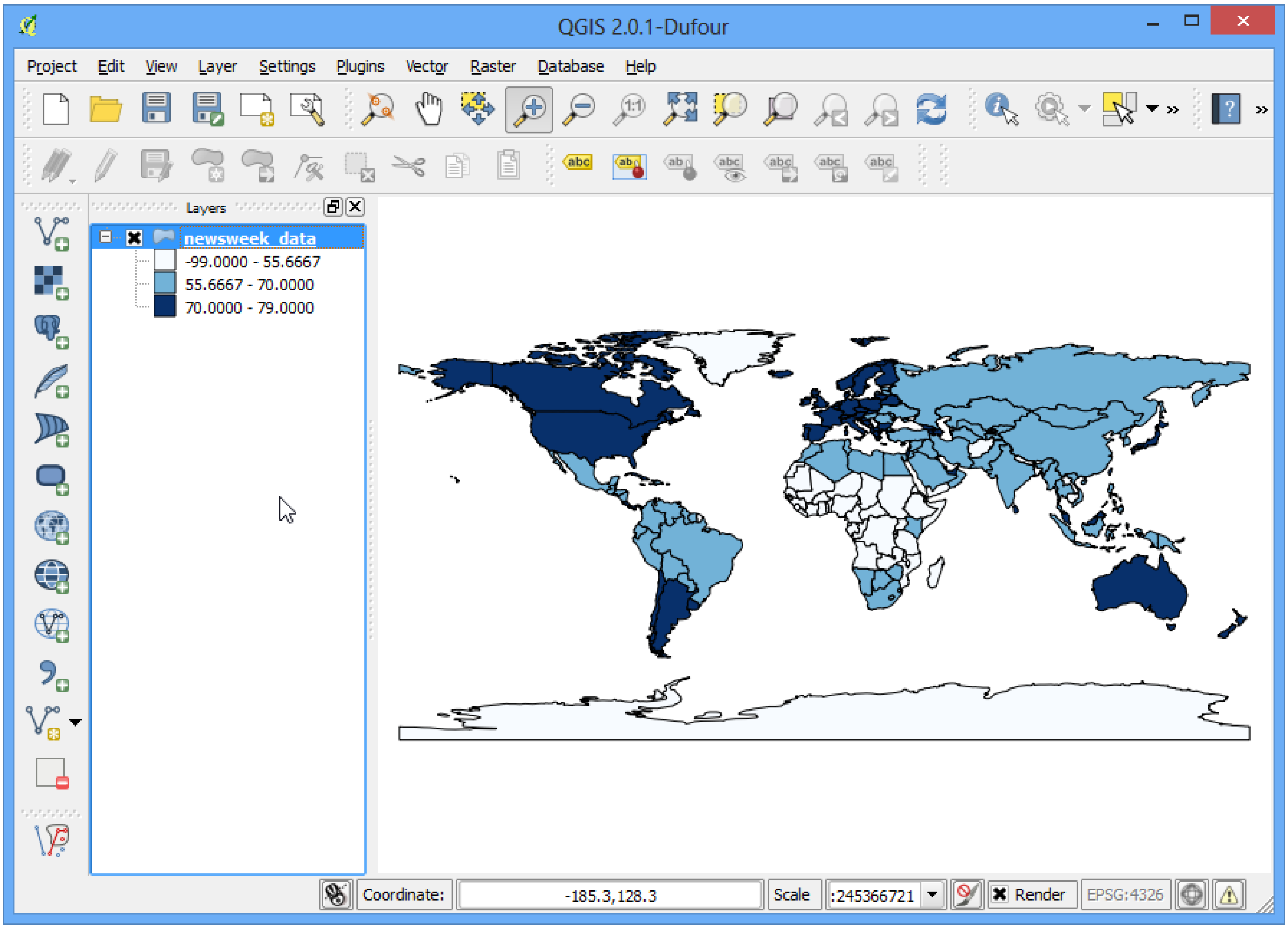
Classes: 3

Color ramp: [source]

Mode: Quantile (Equal Count)

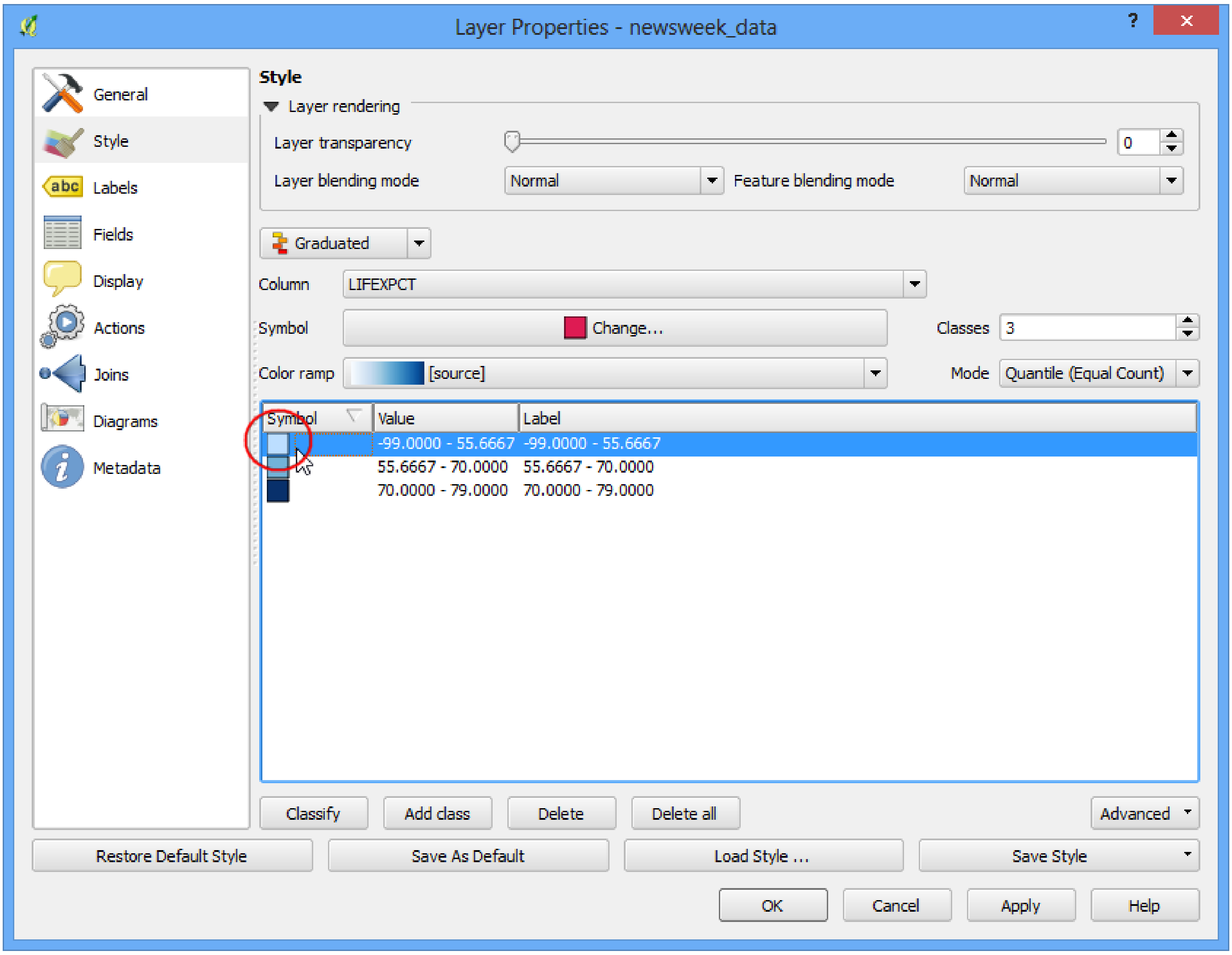
Symbol	Value	Label
⬜	-99.0000 - 55.6667	-99.0000 - 55.6667
🟦	55.6667 - 70.0000	55.6667 - 70.0000
🟦	70.0000 - 79.0000	70.0000 - 79.0000

13. 接著一張具有 3 個顏色的地圖就出現了，上面標註著人口預期壽命的國家區塊。


QGIS 2.0.1-Dufour
Project
Edit
View
Layer
Settings
Plugins
Vector
Raster
Database
Help
Layers
newsweek_data
-99.0000 - 55.6667
55.6667 - 70.0000
70.0000 - 79.0000
Coordinate:
-185.3,128.3
Scale
:245366721
Render
EPSG:4326

□ 按下右鍵選擇　屬性

abel: ` 樣式 ` 選單，這裡還有一些東西可以調。每個類別的符號點下去後都可以進行各自的設定。這裡我們預計使用紅、黃、綠來代表低、中、高的人


Layer Properties - newsweek_data
General
Style
Labels
Fields
Display
Actions
Joins
Diagrams
Metadata
Style
Layer rendering
Classify
Add class
Delete
Delete all
Advanced
Restore Default Style
Save As Default
Load Style ...
Save Style
OK
Cancel
Apply
Help

Layer transparency: 0

Layer blending mode: Normal

Feature blending mode: Normal

Graduated

Column: LIFEXPCT

Symbol: Change...

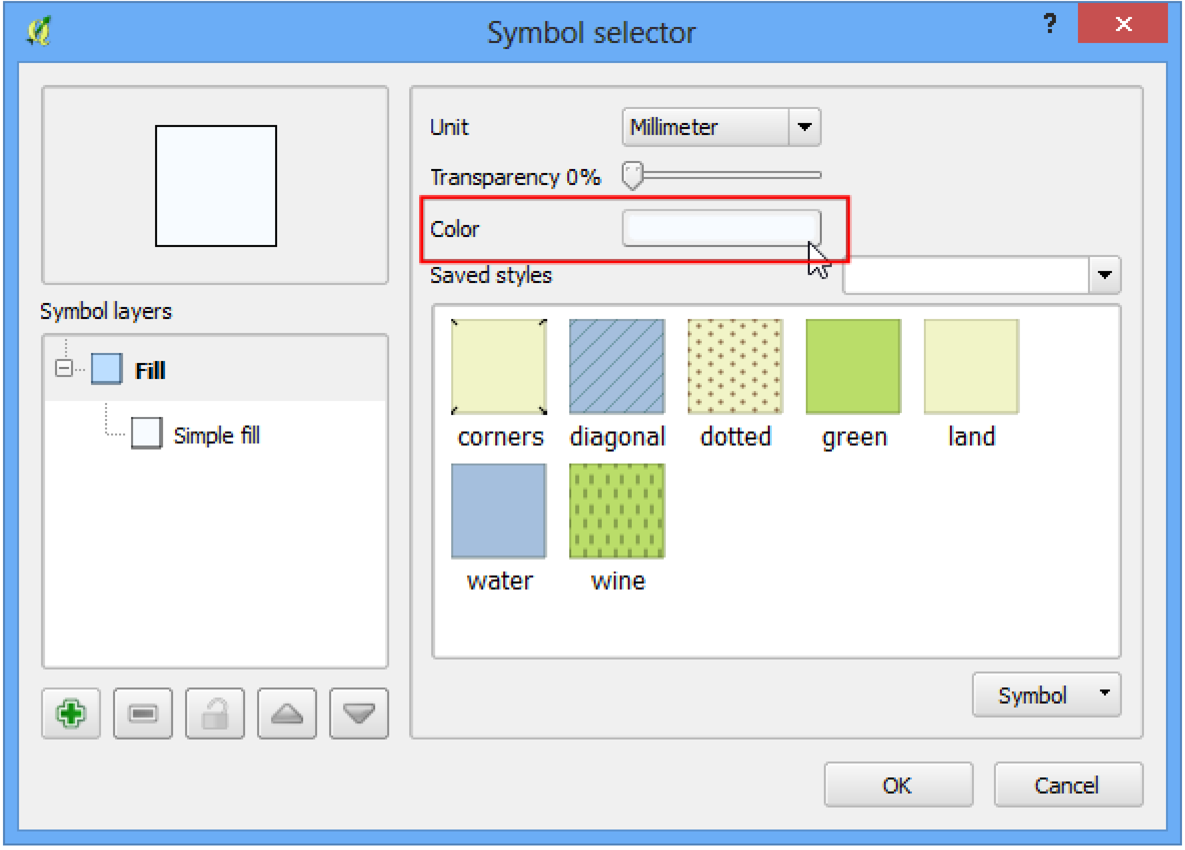
Classes: 3

Color ramp: [source]

Mode: Quantile (Equal Count)

Symbol	Value	Label
	-99.0000 - 55.6667	-99.0000 - 55.6667
	55.6667 - 70.0000	55.6667 - 70.0000
	70.0000 - 79.0000	70.0000 - 79.0000

15. 在 符號選擇 視窗中，按下 :guilabel:` 色彩 ` 的選單，

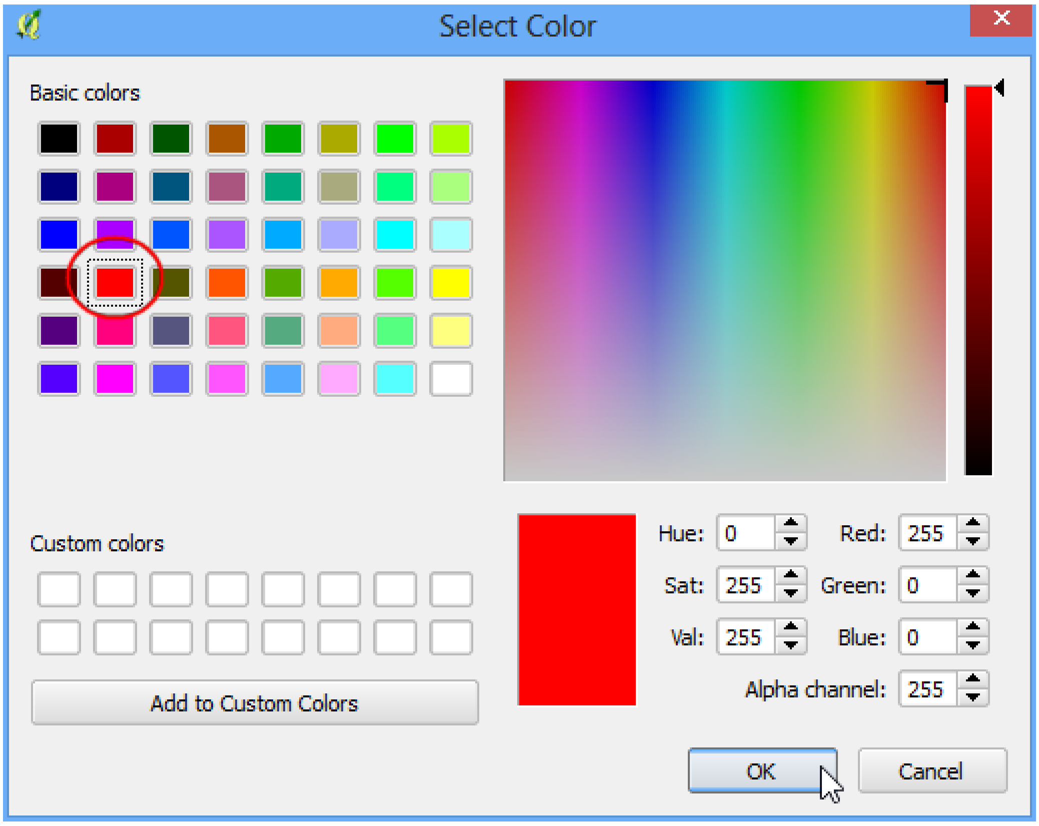

Symbol selector
Symbol layers
Fill
Simple fill
Saved styles
corners
diagonal
dotted
green
land
water
wine
Symbol
OK
Cancel

Unit: Millimeter

Transparency 0%

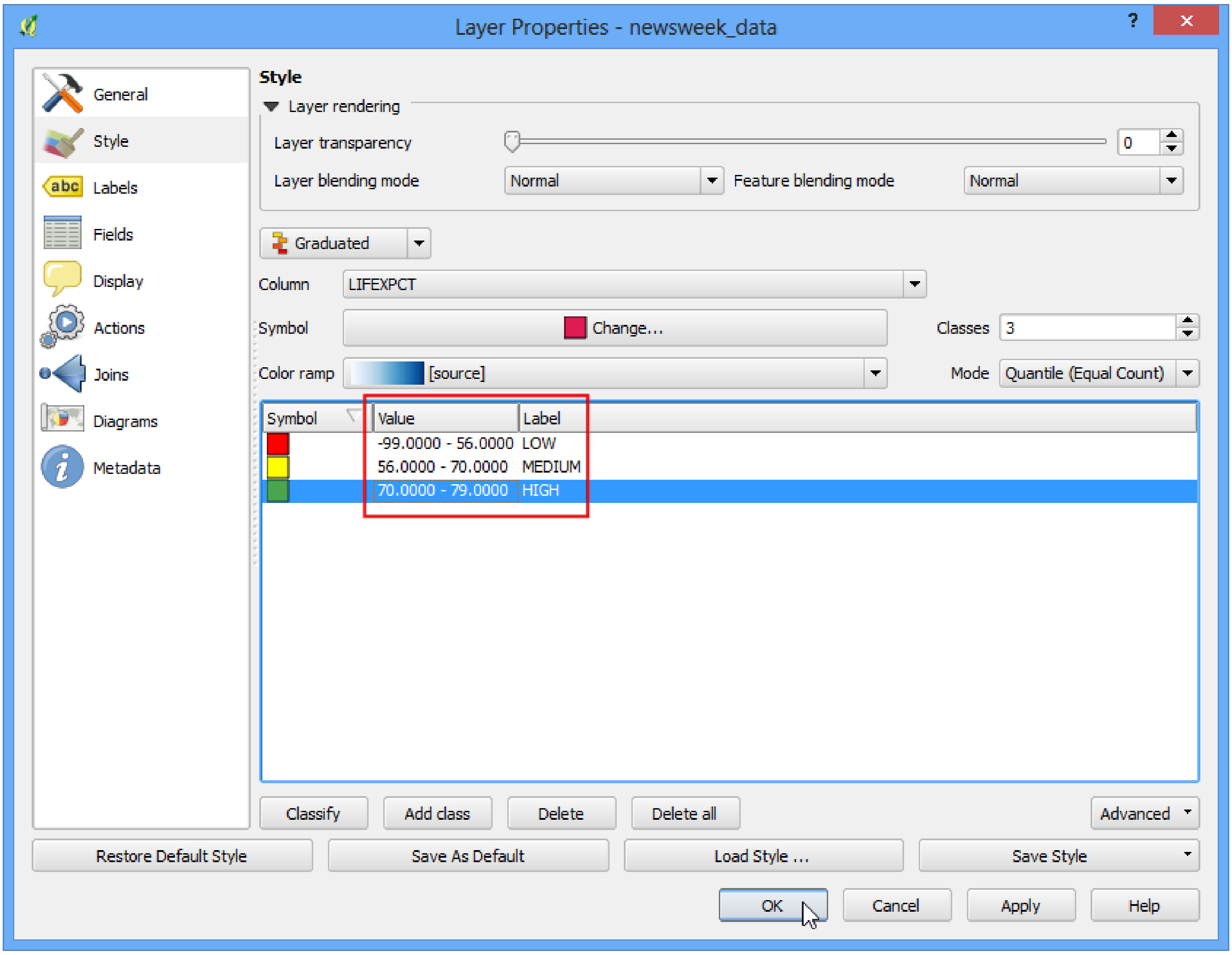
Color

16. 然後在 選取色彩 的視窗中挑選顏色。


Select Color
Basic colors
Custom colors
Add to Custom Colors
OK
Cancel

Hue: 0
Sat: 255
Val: 255
Red: 255
Green: 0
Blue: 0
Alpha channel: 255

17. 回到 圖層屬性 視窗，在 圖例 那邊點兩下，就可以輸入你想要的圖例標籤；而在 值 那邊點兩下，就可以修改類別的邊界範圍。修改完成後就可以按下 確定。


Layer Properties - newsweek_data
General
Style
Labels
Fields
Display
Actions
Joins
Diagrams
Metadata
Style
Layer rendering
Change...
Classify
Add class
Delete
Delete all
Advanced
Restore Default Style
Save As Default
Load Style ...
Save Style
OK
Cancel
Apply
Help

Layer transparency: 0

Layer blending mode: Normal

Feature blending mode: Normal

Graduated

Column: LIFEXPCT

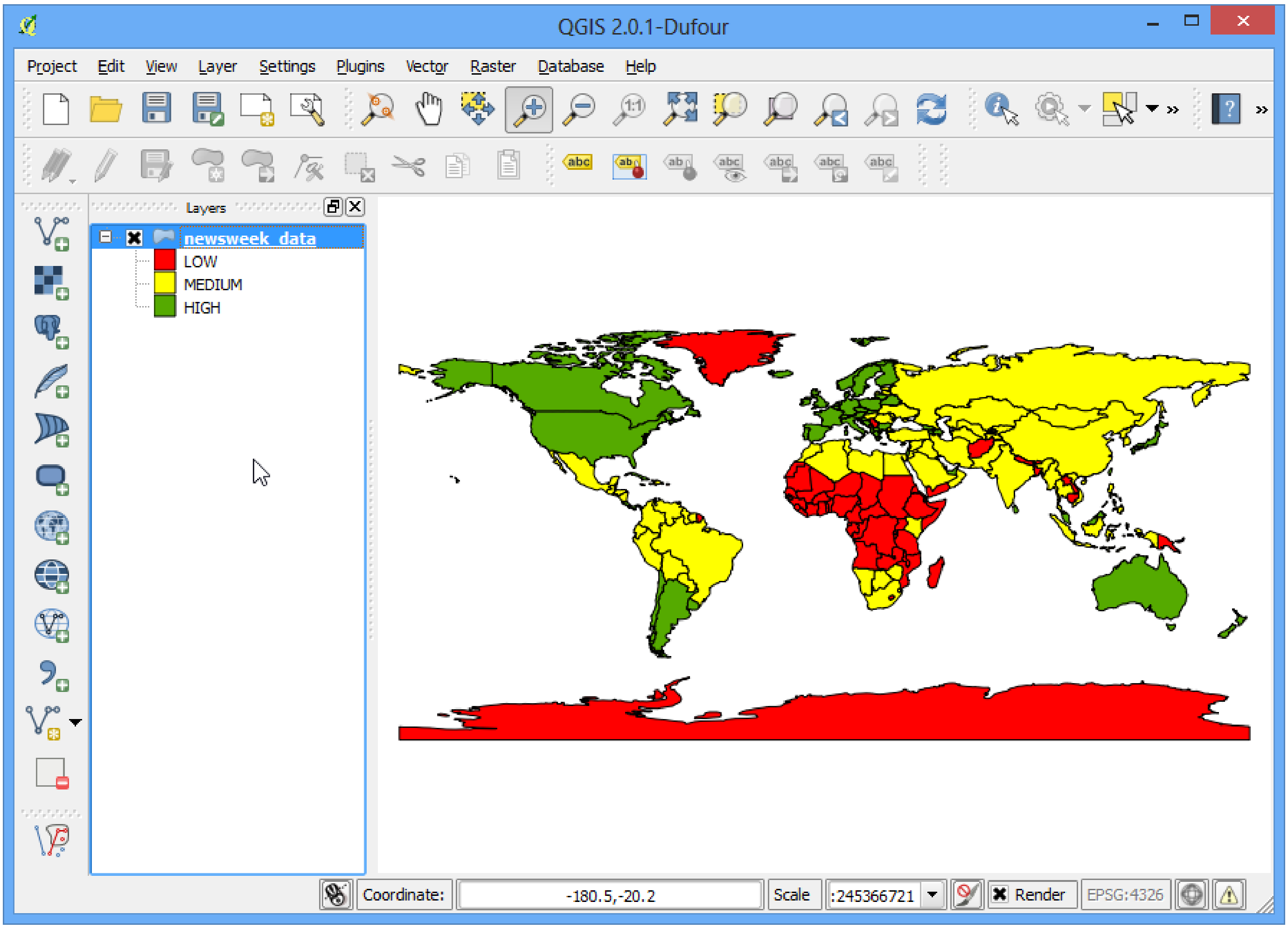
Classes: 3

Color ramp: [source]

Mode: Quantile (Equal Count)

Symbol	Value	Label
🟥	-99.0000 - 56.0000	LOW
🟨	56.0000 - 70.0000	MEDIUM
🟩	70.0000 - 79.0000	HIGH

18. 這次的版本比起前兩次嘗試更為實用，因為它使用清晰的顏色，顯示了我們對於人口預期壽命差異的解讀。



QGIS 2.0.1-Dufour
Project
Edit
View
Layer
Settings
Plugins
Vector
Raster
Database
Help
Layers
newsweek_data
🟥 LOW
🟨 MEDIUM
🟩 HIGH
Render
EPSG:4326

Coordinate: -180.5,-20.2

Scale :245366721