

繪圖軟體應用 第6周(10/16)

1) 海岸線繪製

NOAA : <https://www.ngdc.noaa.gov/mgg/shorelines/shorelines.html>

```
clear;clc;clf
load Pacific_coast.dat %載入檔案
whos
```

Name	Size	Bytes	Class	Attributes
Pacific_coast	14741x2	235856	double	

```
lons = Pacific_coast(:,1); %取出經度
lats = Pacific_coast(:,2); %取出緯度
plot(lons,lats,'k')
xlabel('Longitude','FontSize',16,'FontName','times')
ylabel('Latitude','FontSize',16,'FontName','times')
title('The Coastline of the west Pacific')
axis([110 130 15 40])
axis('image') %讓圖形在縮放之後不會變形
text(120,24,'Taiwan','FontSize',13,'FontName','times','Color','r')%在圖中標示台灣
text(115,30,'China','FontSize',14,'FontName','times','Color','r')%在圖中標示中國

%自訂坐標軸區間
get(gca) %get current axes，查詢可調整的東西
```

```
ALim: [0 1]
ALimMode: 'auto'
ActivePositionProperty: 'outerposition'
AlphaScale: 'linear'
Alphamap: [1x64 double]
AmbientLightColor: [1 1 1]
BeingDeleted: 'off'
Box: 'on'
BoxStyle: 'back'
BusyAction: 'queue'
ButtonDownFcn: ''
CLim: [0 1]
CLimMode: 'auto'
CameraPosition: [120.0207 30.9062 149.8917]
CameraPositionMode: 'auto'
CameraTarget: [120.0207 30.9062 0]
CameraTargetMode: 'auto'
CameraUpVector: [0 1 0]
CameraUpVectorMode: 'auto'
CameraViewAngle: 8.4588
CameraViewAngleMode: 'auto'
Children: [3x1 Graphics]
Clipping: 'on'
ClippingStyle: '3dbox'
Color: [1 1 1]
ColorOrder: [7x3 double]
ColorOrderIndex: 1
ColorScale: 'linear'
Colormap: [64x3 double]
CreateFcn: ''
CurrentPoint: [2x3 double]
```

```

    DataAspectRatio: [1 1 1]
DataAspectRatioMode: 'manual'
    DeleteFcn: ''
    FontAngle: 'normal'
    FontName: 'Helvetica'
    FontSize: 10
    FontSizeMode: 'auto'
    FontSmoothing: 'on'
    FontUnits: 'points'
    FontWeight: 'normal'
    GridAlpha: 0.1500
    GridAlphaMode: 'auto'
    GridColor: [0.1500 0.1500 0.1500]
    GridColorMode: 'auto'
    GridLineStyle: '-'
    HandleVisibility: 'on'
    HitTest: 'on'
    Interactions: [1x1 matlab.graphics.interaction.interface.DefaultAxesInteractionSet]
    Interruptible: 'on'
LabelFontSizeMultiplier: 1.1000
    Layer: 'bottom'
    Legend: [0x0 GraphicsPlaceholder]
    LineStyleOrder: '-'
    LineStyleOrderIndex: 1
    LineWidth: 0.5000
    MinorGridAlpha: 0.2500
    MinorGridAlphaMode: 'auto'
    MinorGridColor: [0.1000 0.1000 0.1000]
    MinorGridColorMode: 'auto'
    MinorGridLineStyle: ':'
    NextPlot: 'replace'
    OuterPosition: [0 0 1 1]
    Parent: [1x1 Figure]
    PickableParts: 'visible'
    PlotBoxAspectRatio: [10.0402 11.0846 1]
    PlotBoxAspectRatioMode: 'auto'
    Position: [0.1300 0.1163 0.7750 0.8087]
    Projection: 'orthographic'
    Selected: 'off'
    SelectionHighlight: 'on'
    SortMethod: 'childorder'
    Tag: ''
    TickDir: 'in'
    TickDirMode: 'auto'
    TickLabelInterpreter: 'tex'
    TickLength: [0.0100 0.0250]
    TightInset: [0 0.1159 0 0.0540]
    Title: [1x1 Text]
TitleFontSizeMultiplier: 1.1000
    TitleFontWeight: 'bold'
    Toolbar: [1x1 AxesToolbar]
    Type: 'axes'
    UIContextMenu: [0x0 GraphicsPlaceholder]
    Units: 'normalized'
    UserData: []
    View: [0 90]
    Visible: 'on'
    XAxis: [1x1 NumericRuler]
    XAxisLocation: 'bottom'
    XColor: [0.1500 0.1500 0.1500]
    XColorMode: 'auto'
    XDir: 'normal'
    XGrid: 'off'
    XLabel: [1x1 Text]
    XLim: [109.9804 130.0609]

```

```

        XLimMode: 'auto'
        XMinorGrid: 'off'
        XMinorTick: 'off'
        XScale: 'linear'
        XTick: [110 115 120 125 130]
        XTickLabel: {5×1 cell}
        XTickLabelMode: 'auto'
        XTickLabelRotation: 0
        XTickMode: 'auto'
        YAxis: [1×1 NumericRuler]
        YAxisLocation: 'left'
        YColor: [0.1500 0.1500 0.1500]
        YColorMode: 'auto'
        YDir: 'normal'
        YGrid: 'off'
        YLabel: [1×1 Text]
        YLim: [19.8216 41.9909]
        YLimMode: 'auto'
        YMinorGrid: 'off'
        YMinorTick: 'off'
        YScale: 'linear'
        YTick: [20 22 24 26 28 30 32 34 36 38 40]
        YTickLabel: {11×1 cell}
        YTickLabelMode: 'auto'
        YTickLabelRotation: 0
        YTickMode: 'auto'
        ZAxis: [1×1 NumericRuler]
        ZColor: [0.1500 0.1500 0.1500]
        ZColorMode: 'auto'
        ZDir: 'normal'
        ZGrid: 'off'
        ZLabel: [1×1 Text]
        ZLim: [-1 1]
        ZLimMode: 'auto'
        ZMinorGrid: 'off'
        ZMinorTick: 'off'
        ZScale: 'linear'
        ZTick: [-1 0 1]
        ZTickLabel: ''
        ZTickLabelMode: 'auto'
        ZTickLabelRotation: 0
        ZTickMode: 'auto'

```

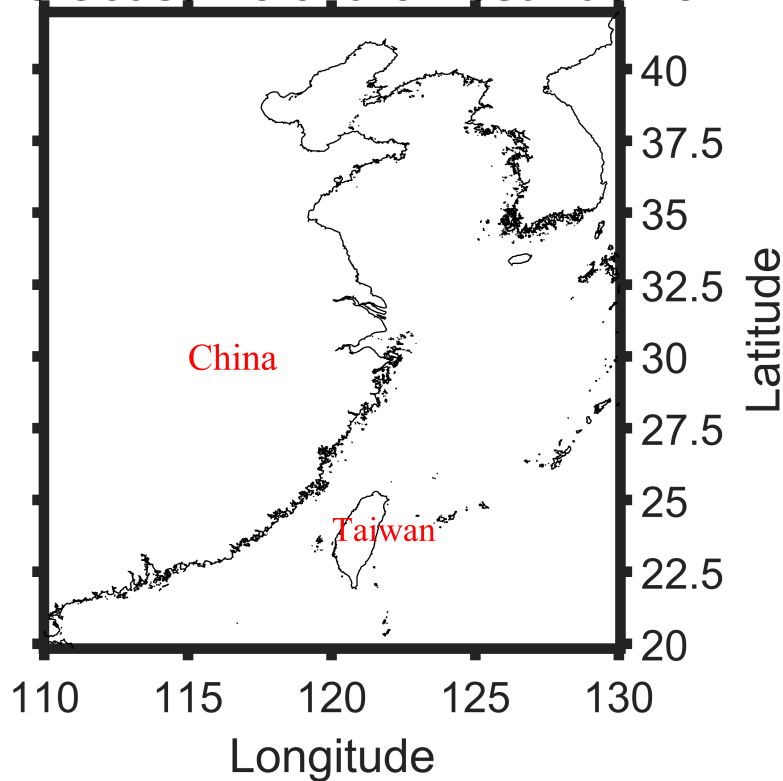
```

set(gca,'fontsize',16)%坐標軸設定字體大小設定
set(gca,'LineWidth',4)%坐標軸設定粗細
set(gca,'TickDir','out')%設定座標tick的方向向外
set(gca,'XTick',[110:5:130])%改變 X 座標標示 110到130間隔5
set(gca,'YTick',[20:2.5:40])%改變 Y 座標標示 20到40間隔2.5
set(gca,'yAxisLocation','right') %把 Y 軸改到右邊

print('Pcacific_coast_00781035','-djpeg') %存圖

```

The Coastline of the west Pacific



```
dir %查詢資料夾裡有哪些檔案
```

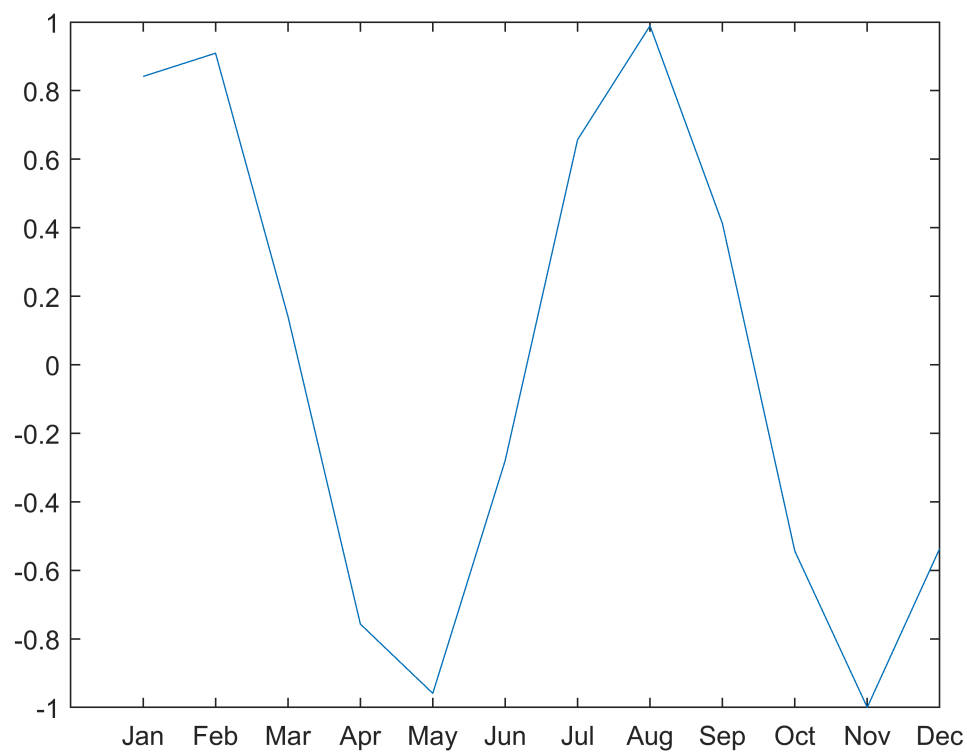
```
.          Pcacific_coast_00781035.jpg  gshhg-shp-2.3.7
..         Pcacific_coast_00781035.png  gshhg-shp-2.3.7.zip
COPYING.LESSERV3  README.TXT          map_W61.mlx
GSHHS_shp         SHAPEFILES.TXT       plot_coast.rtf
LICENSE.TXT       WDBII_shp
Pacific_coast.dat geodas-ng_setup.exe
```

2) 改變坐標軸標示為文字

```
clear;clc;clf
x = linspace(1,12,12);
y = sin(x);
whos
```

Name	Size	Bytes	Class	Attributes
x	1x12	96	double	
y	1x12	96	double	

```
plot(x,y)
set(gca,'XTick',[1:12],'xticklabel',{'Jan';'Feb';'Mar';'Apr';'May';...
    'Jun';'Jul';'Aug';'Sep';'Oct';'Nov';'Dec'})
```



3) 畫圖中之圖

在圖中告訴讀者畫出的圖在哪裡

doc axes

doc axes properties

```
clear;clc;clf
load Pacific_coast.dat %載入檔案
whos
```

Name	Size	Bytes	Class	Attributes
Pacific_coast	14741x2	235856	double	

```
lons = Pacific_coast(:,1); %取出經度
lats = Pacific_coast(:,2); %取出緯度
plot(lons,lats,'k')
xlabel('Longitude','FontSize',16,'FontName','times')
ylabel('Latitude','FontSize',16,'FontName','times')
title('The Coastline of the North Taiwan')
axis([121.1 122 24.9 25.5])
% axis('image') %讓圖形在縮放之後不會變形
text(120,24,'Taiwan','FontSize',13,'FontName','times','Color','r')%在圖中標示台灣

get(gca); %get current axes，查詢可調整的東西
```

ALim: [0 1]

```

        ALimMode: 'auto'
ActivePositionProperty: 'outerposition'
        AlphaScale: 'linear'
        Alphamap: [1×64 double]
        AmbientLightColor: [1 1 1]
        BeingDeleted: 'off'
        Box: 'on'
        BoxStyle: 'back'
        BusyAction: 'queue'
        ButtonDownFcn: ''
        CLim: [0 1]
        CLimMode: 'auto'
        CameraPosition: [121.5500 25.2000 17.3205]
        CameraPositionMode: 'auto'
        CameraTarget: [121.5500 25.2000 0]
        CameraTargetMode: 'auto'
        CameraUpVector: [0 1 0]
        CameraUpVectorMode: 'auto'
        CameraViewAngle: 6.6086
        CameraViewAngleMode: 'auto'
        Children: [2×1 Graphics]
        Clipping: 'on'
        ClippingStyle: '3dbox'
        Color: [1 1 1]
        ColorOrder: [7×3 double]
        ColorOrderIndex: 1
        ColorScale: 'linear'
        Colormap: [64×3 double]
        CreateFcn: ''
        CurrentPoint: [2×3 double]
        DataAspectRatio: [1.5000 1 3.3333]
        DataAspectRatioMode: 'auto'
        DeleteFcn: ''
        FontAngle: 'normal'
        FontName: 'Helvetica'
        FontSize: 10
        FontSizeMode: 'auto'
        FontSmoothing: 'on'
        FontUnits: 'points'
        FontWeight: 'normal'
        GridAlpha: 0.1500
        GridAlphaMode: 'auto'
        GridColor: [0.1500 0.1500 0.1500]
        GridColorMode: 'auto'
        GridLineStyle: '-'
        HandleVisibility: 'on'
        HitTest: 'on'
        Interactions: [1×1 matlab.graphics.interaction.interface.DefaultAxesInteractionSet]
        Interruptible: 'on'
LabelFontSizeMultiplier: 1.1000
        Layer: 'bottom'
        Legend: [0×0 GraphicsPlaceholder]
        LineStyleOrder: '-'
        LineStyleOrderIndex: 1
        LineWidth: 0.5000
        MinorGridAlpha: 0.2500
        MinorGridAlphaMode: 'auto'
        MinorGridColor: [0.1000 0.1000 0.1000]
        MinorGridColorMode: 'auto'
        MinorGridLineStyle: ':'
        NextPlot: 'replace'
        OuterPosition: [0 0 1 1]
        Parent: [1×1 Figure]
        PickableParts: 'visible'
        PlotBoxAspectRatio: [1 0.7834 0.7834]

```

```

PlotBoxAspectRatioMode: 'auto'
    Position: [0.1300 0.1163 0.7750 0.8087]
    Projection: 'orthographic'
    Selected: 'off'
    SelectionHighlight: 'on'
    SortMethod: 'childorder'
    Tag: ''
    TickDir: 'in'
    TickDirMode: 'auto'
    TickLabelInterpreter: 'tex'
    TickLength: [0.0100 0.0250]
    TightInset: [0.1077 0.1159 0.0304 0.0540]
    Title: [1x1 Text]
TitleFontSizeMultiplier: 1.1000
TitleFontWeight: 'bold'
    Toolbar: [1x1 AxesToolbar]
    Type: 'axes'
    UIContextMenu: [0x0 GraphicsPlaceholder]
    Units: 'normalized'
    UserData: []
    View: [0 90]
    Visible: 'on'
    XAxis: [1x1 NumericRuler]
    XAxisLocation: 'bottom'
    XColor: [0.1500 0.1500 0.1500]
    XColorMode: 'auto'
    XDir: 'normal'
    XGrid: 'off'
    XLabel: [1x1 Text]
    XLim: [121.1000 122]
    XLimMode: 'manual'
    XMinorGrid: 'off'
    XMinorTick: 'off'
    XScale: 'linear'
    XTick: [1x10 double]
    XTickLabel: {10x1 cell}
    XTickLabelMode: 'auto'
    XTickLabelRotation: 0
    XTickMode: 'auto'
    YAxis: [1x1 NumericRuler]
    YAxisLocation: 'left'
    YColor: [0.1500 0.1500 0.1500]
    YColorMode: 'auto'
    YDir: 'normal'
    YGrid: 'off'
    YLabel: [1x1 Text]
    YLim: [24.9000 25.5000]
    YLimMode: 'manual'
    YMinorGrid: 'off'
    YMinorTick: 'off'
    YScale: 'linear'
    YTick: [24.9000 25 25.1000 25.2000 25.3000 25.4000 25.5000]
    YTickLabel: {7x1 cell}
    YTickLabelMode: 'auto'
    YTickLabelRotation: 0
    YTickMode: 'auto'
    ZAxis: [1x1 NumericRuler]
    ZColor: [0.1500 0.1500 0.1500]
    ZColorMode: 'auto'
    ZDir: 'normal'
    ZGrid: 'off'
    ZLabel: [1x1 Text]
    ZLim: [-1 1]
    ZLimMode: 'auto'
    ZMinorGrid: 'off'

```

```

ZMinorTick: 'off'
ZScale: 'linear'
ZTick: [-1 0 1]
ZTickLabel: ''
ZTickLabelMode: 'auto'
ZTickLabelRotation: 0
ZTickMode: 'auto'

```

```

set(gca, 'fontsize',16, 'LineWidth',4, 'TickDir', 'out')
set(gca, 'XTick', [110:5:130], 'YTick', [20:2.5:40], 'yAxisLocation', 'left')

```

%% 畫圖中圖

```
get(gca, 'position') % 左 底部 寬度 高度
```

```

ans = 1x4
    0.1300    0.1100    0.7750    0.8034

```

```
axes('position',[0.13 0.6 0.4 0.325])
```

hold on

```

load Pacific_coast.dat %載入檔案
lons = Pacific_coast(:,1); %取出經度
lats = Pacific_coast(:,2); %取出緯度
plot(lons,lats,'k')
% xlabel('Longitude','FontSize',16,'FontName','times')
% ylabel('Latitude','FontSize',16,'FontName','times')
% title('The Coastline of the west Pacific')
axis([110 130 15 40])
axis('image') %讓圖形在縮放之後不會變形
text(120,24,'Taiwan','FontSize',13,'FontName','times','Color','r')%在圖中標示台灣

```

%自訂坐標軸區間

```
get(gca) %get current axes，查詢可調整的東西
```

```

ALim: [0 1]
ALimMode: 'auto'
ActivePositionProperty: 'position'
AlphaScale: 'linear'
Alphamap: [1x64 double]
AmbientLightColor: [1 1 1]
BeingDeleted: 'off'
Box: 'off'
BoxStyle: 'back'
BusyAction: 'queue'
ButtonDownFcn: ''
CLim: [0 1]
CLimMode: 'auto'
CameraPosition: [120.0207 30.9062 149.8917]
CameraPositionMode: 'auto'
CameraTarget: [120.0207 30.9062 0]
CameraTargetMode: 'auto'
CameraUpVector: [0 1 0]
CameraUpVectorMode: 'auto'
CameraViewAngle: 8.4588
CameraViewAngleMode: 'auto'
Children: [2x1 Graphics]
Clipping: 'on'
ClippingStyle: '3dbox'
Color: [1 1 1]

```



```

        ColorOrder: [7×3 double]
    ColorOrderIndex: 1
        ColorScale: 'linear'
        Colormap: [64×3 double]
        CreateFcn: ''
        CurrentPoint: [2×3 double]
    DataAspectRatio: [1 1 1]
    DataAspectRatioMode: 'manual'
        DeleteFcn: ''
        FontAngle: 'normal'
        FontName: 'Helvetica'
        FontSize: 8.5000
        FontSizeMode: 'auto'
        FontSmoothing: 'on'
        FontUnits: 'points'
        FontWeight: 'normal'
        GridAlpha: 0.1500
        GridAlphaMode: 'auto'
        GridColor: [0.1500 0.1500 0.1500]
        GridColorMode: 'auto'
        GridLineStyle: '-'
    HandleVisibility: 'on'
        HitTest: 'on'
        Interactions: [1×1 matlab.graphics.interaction.interface.DefaultAxesInteractionSet]
    Interruptible: 'on'
    LabelFontSizeMultiplier: 1.1000
        Layer: 'bottom'
        Legend: [0×0 GraphicsPlaceholder]
        LineStyleOrder: '-'
    LineStyleOrderIndex: 1
        LineWidth: 0.5000
        MinorGridAlpha: 0.2500
        MinorGridAlphaMode: 'auto'
        MinorGridColor: [0.1000 0.1000 0.1000]
        MinorGridColorMode: 'auto'
        MinorGridLineStyle: ':'
        NextPlot: 'add'
        OuterPosition: [0.0629 0.5561 0.5161 0.3988]
        Parent: [1×1 Figure]
        PickableParts: 'visible'
    PlotBoxAspectRatio: [10.0402 11.0846 1]
    PlotBoxAspectRatioMode: 'auto'
        Position: [0.1300 0.6000 0.4000 0.3250]
        Projection: 'orthographic'
        Selected: 'off'
    SelectionHighlight: 'on'
        SortMethod: 'childorder'
        Tag: ''
        TickDir: 'in'
        TickDirMode: 'auto'
    TickLabelInterpreter: 'tex'
        TickLength: [0.0100 0.0250]
        TightInset: [0 0.0427 0 0]
        Title: [1×1 Text]
    TitleFontSizeMultiplier: 1.1000
        TitleFontWeight: 'bold'
        Toolbar: [1×1 AxesToolbar]
        Type: 'axes'
    UIContextMenu: [0×0 GraphicsPlaceholder]
        Units: 'normalized'
        UserData: []
        View: [0 90]
        Visible: 'on'
        XAxis: [1×1 NumericRuler]
    XAxisLocation: 'bottom'

```

```

        XColor: [0.1500 0.1500 0.1500]
        XColorMode: 'auto'
        XDir: 'normal'
        XGrid: 'off'
        XLabel: [1x1 Text]
        XLim: [109.9804 130.0609]
        XLimMode: 'auto'
        XMinorGrid: 'off'
        XMinorTick: 'off'
        XScale: 'linear'
        XTick: [110 120 130]
        XTickLabel: {3x1 cell}
        XTickLabelMode: 'auto'
        XTickLabelRotation: 0
        XTickMode: 'auto'
        YAxis: [1x1 NumericRuler]
        YAxisLocation: 'left'
        YColor: [0.1500 0.1500 0.1500]
        YColorMode: 'auto'
        YDir: 'normal'
        YGrid: 'off'
        YLabel: [1x1 Text]
        YLim: [19.8216 41.9909]
        YLimMode: 'auto'
        YMinorGrid: 'off'
        YMinorTick: 'off'
        YScale: 'linear'
        YTick: [20 25 30 35 40]
        YTickLabel: {5x1 cell}
        YTickLabelMode: 'auto'
        YTickLabelRotation: 0
        YTickMode: 'auto'
        ZAxis: [1x1 NumericRuler]
        ZColor: [0.1500 0.1500 0.1500]
        ZColorMode: 'auto'
        ZDir: 'normal'
        ZGrid: 'off'
        ZLabel: [1x1 Text]
        ZLim: [-1 1]
        ZLimMode: 'auto'
        ZMinorGrid: 'off'
        ZMinorTick: 'off'
        ZScale: 'linear'
        ZTick: [-1 0 1]
        ZTickLabel: ''
        ZTickLabelMode: 'auto'
        ZTickLabelRotation: 0
        ZTickMode: 'auto'

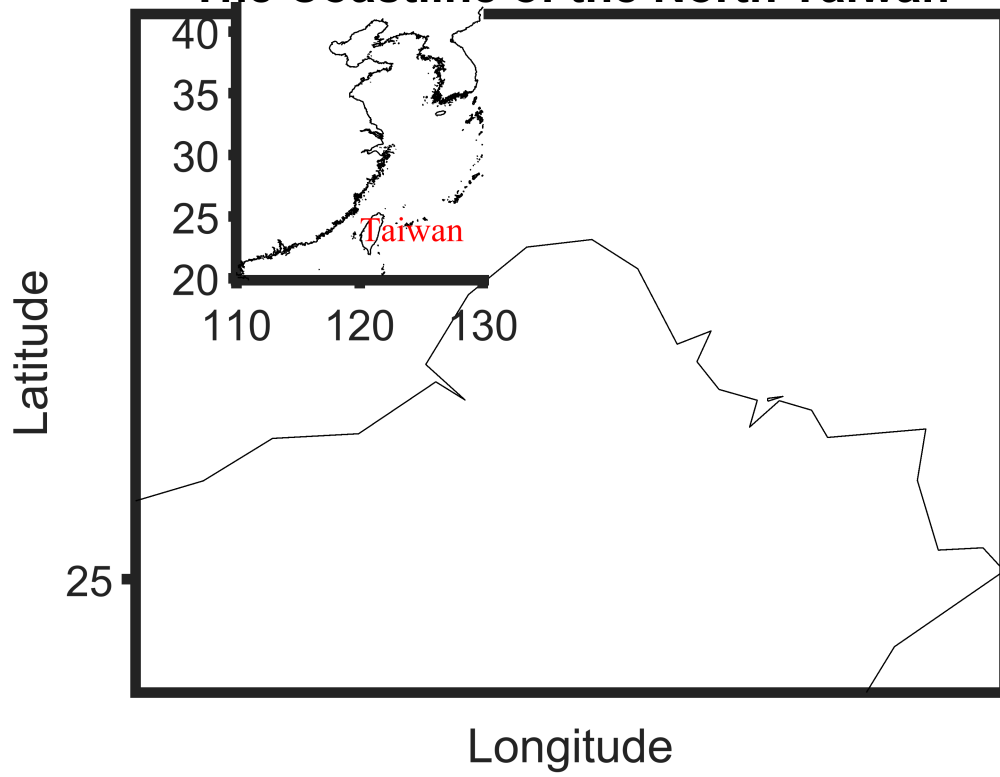
```

```

set(gca,'fontsize',16)%坐標軸設定字體大小設定
set(gca,'LineWidth',4)%坐標軸設定粗細
set(gca,'TickDir','out')%設定座標tick的方向向外
set(gca,'XTick',[110:10:130])%改變 X 座標標示 110到130間隔5
set(gca,'YTick',[20:5:40])%改變 Y 座標標示 20到40間隔2.5
print('coast_NorthTaiwan','-djpeg') %存圖

```

The Coastline of the North Taiwan



4)