

Appendix 8 Example Matlab (Version 2010a ©) code for GIS mapping

```
function createfigure(VertexNormals1, ZData1, YData1, XData1, Vertices1,
Faces1, ZData2, YData2, XData2, CData1, XData3, YData3, ZData3, XData4,
YData4, ZData4)
%CREATEFIGURE (VERTEXNORMALS1,ZDATA1,YDATA1,XDATA1,VERTICES1,FACES1,ZDATA2,YDA
TA2,XDATA2,CDATA1,XDATA3,YDATA3,ZDATA3,XDATA4,YDATA4,ZDATA4)
% VERTEXNORMALS1: patch vertexnormals
% ZDATA1: patch zdata
% YDATA1: patch ydata
% XDATA1: patch xdata
% VERTICES1: patch vertices
% FACES1: patch faces
% ZDATA2: surface zdata
% YDATA2: surface ydata
% XDATA2: surface xdata
% CDATA1: surface cdata
% XDATA3: line xdata
% YDATA3: line ydata
% ZDATA3: line zdata
% XDATA4: line xdata
% YDATA4: line ydata
% ZDATA4: line zdata

% Create figure
figure1 = figure('Colormap',...
[0 1 1;0 0.4 0.2;0.0108220603537981 0.419354838709677
0.20190997281058;0.0226430801248699 0.438709677419355
0.203833372495049;0.0354630593132154 0.458064516129032
0.2058668725454;0.0492819979188345 0.47741935483871
0.208107146453627;0.0640998959417274 0.496774193548387
0.210650867711725;0.0799167533818938 0.516129032258065
0.213594709811688;0.096732570239334 0.535483870967742
0.21703534624551;0.114547346514048 0.554838709677419
0.221069450505186;0.133361082206035 0.574193548387097
0.22579369608271;0.153173777315297 0.593548387096774
0.231304756470075;0.173985431841831 0.612903225806452
0.237699305159276;0.19579604578564 0.632258064516129
0.245074015642308;0.218605619146722 0.651612903225806
0.253525561411165;0.242414151925078 0.670967741935484
0.26315061595784;0.267221644120708 0.690322580645161
0.274045852774328;0.299748246114598 0.709677419354839
0.293028095733611;0.339633446342855 0.729032258064516
0.319833506763788;0.379956362659864 0.748387096774193
0.347637877211238;0.42062032157363 0.767741935483871
0.376441207075962;0.461528649592159 0.787096774193548
0.40624349635796;0.502584673223457 0.806451612903226
0.437044745057232;0.543691718975529 0.825806451612903
0.468844953173777;0.584753113356383 0.845161290322581
0.501644120707596;0.625672182874022 0.864516129032258
0.535442247658689;0.666352254036454 0.883870967741936
0.570239334027055;0.706696653351683 0.903225806451613
0.606035379812695;0.746608707327716 0.92258064516129
0.642830385015609;0.785991742472559 0.941935483870968
0.680624349635796;0.824749085294216 0.961290322580645
0.719417273673257;0.862784062300695 0.980645161290323 0.759209157127992;0.9 1
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0.8;0.877665514193325 0.980645161290323 0.759209157127992;0.857258903695747
0.961290322580645 0.719417273673257;0.83867543889094 0.941935483870968
0.680624349635796;0.821810390162577 0.92258064516129
0.642830385015609;0.806559027894331 0.903225806451613
0.606035379812695;0.792816622469873 0.883870967741935
0.570239334027055;0.780478444272879 0.864516129032258
0.535442247658689;0.76943976368702 0.845161290322581
0.501644120707596;0.759595851095969 0.825806451612903
0.468844953173777;0.750841976883399 0.806451612903226
0.437044745057232;0.743073411432983 0.787096774193548
0.40624349635796;0.736185425128394 0.767741935483871
0.376441207075962;0.730073288353306 0.748387096774193
0.347637877211238;0.72463227149139 0.729032258064516
0.319833506763788;0.709677419354839 0.699597193783357
0.293028095733611;0.690322580645161 0.665300482248554
0.267221644120708;0.670967741935484 0.630646839649559
0.242414151925078;0.651612903225806 0.595740995602699
0.218605619146722;0.632258064516129 0.560687679724302
0.19579604578564;0.612903225806452 0.525591621630694
0.173985431841831;0.593548387096774 0.490557550938203
0.153173777315297;0.574193548387097 0.455690197263156
0.133361082206035;0.554838709677419 0.421094290221879
0.114547346514048;0.535483870967742 0.386874559430701
0.096732570239334;0.516129032258065 0.353135734505947
0.0799167533818938;0.496774193548387 0.319982545063946
0.0640998959417274;0.47741935483871 0.287519720721023
0.0492819979188346;0.458064516129032 0.255851991093507
0.0354630593132154;0.438709677419355 0.225084085797724
0.0226430801248699;0.419354838709677 0.195320734450002 0.0108220603537981;0.4
0.166666666666667 0]);

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% Create axes

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axes1 = axes('Visible','off','Parent',figure1,'ZTick',zeros(1,0),...
    'YTick',zeros(1,0),...
    'XTick',zeros(1,0),...
    'DataAspectRatio',[1 1 1],...
    'CLim',[-46.8095238563333 2949]);
% Uncomment the following line to preserve the X-limits of the axes
% xlim(axes1,[-0.196859849734998 0.196859849734998]);
% Uncomment the following line to preserve the Y-limits of the axes
% ylim(axes1,[-0.027302457872043 0.170459285735643]);
box(axes1,'on');
hold(axes1,'all');

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% Create patch

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patch('Parent',axes1,'Tag','Frame','VertexNormals',VertexNormals1,...
    'ZData',ZData1,...
    'YData',YData1,...
    'XData',XData1,...
    'Vertices',Vertices1,...
    'LineWidth',2,...
    'Faces',Faces1,...
    'FaceColor','none');

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% Create surface

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surface('Parent',axes1,'ZData',ZData2,'YData',YData2,'XData',XData2,...

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        'LineStyle','none',...
        'FaceColor','texturemap',...
        'CData',CData1);

% Create line
line(XData3,YData3,ZData3,'Parent',axes1,'Tag','Parallel','LineStyle',':',...
     'Color',[0.75 0.75 0.75]);

% Create line
line(XData4,YData4,ZData4,'Parent',axes1,'Tag','Meridian','LineStyle',':',...
     'Color',[0.75 0.75 0.75]);

% Create text
text('Parent',axes1,'Tag','MLabel','String',' 64^{\circ} W',...
     'Position',[-0.191446482203721 0 3],...
     'HorizontalAlignment','center');

% Create text
text('Parent',axes1,'Tag','MLabel','String',' 62^{\circ} W',...
     'Position',[-0.156730060396577 0 3],...
     'HorizontalAlignment','center');

% Create text
text('Parent',axes1,'Tag','MLabel','String',' 60^{\circ} W',...
     'Position',[-0.122013638589432 0 3],...
     'HorizontalAlignment','center');

% Create text
text('Parent',axes1,'Tag','MLabel','String',' 58^{\circ} W',...
     'Position',[-0.0872972167822881 0 3],...
     'HorizontalAlignment','center');

% Create text
text('Parent',axes1,'Tag','MLabel','String',' 56^{\circ} W',...
     'Position',[-0.0525807949751439 0 3],...
     'HorizontalAlignment','center');

% Create text
text('Parent',axes1,'Tag','MLabel','String',' 54^{\circ} W',...
     'Position',[-0.0178643731679996 0 3],...
     'HorizontalAlignment','center');

% Create text
text('Parent',axes1,'Tag','MLabel','String',' 52^{\circ} W',...
     'Position',[0.0168520486391446 0 3],...
     'HorizontalAlignment','center');

% Create text
text('Parent',axes1,'Tag','MLabel','String',' 50^{\circ} W',...
     'Position',[0.0515684704462887 0 3],...
     'HorizontalAlignment','center');

% Create text
text('Parent',axes1,'Tag','MLabel','String',' 48^{\circ} W',...
     'Position',[0.0862848922534331 0 3],...

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        'HorizontalAlignment','center');

% Create text
text('Parent',axes1,'Tag','MLabel','String',' 46^{\circ} W',...
     'Position',[0.121001314060577 0 3],...
     'HorizontalAlignment','center');

% Create text
text('Parent',axes1,'Tag','MLabel','String',' 44^{\circ} W',...
     'Position',[0.155717735867722 0 3],...
     'HorizontalAlignment','center');

% Create text
text('Parent',axes1,'Tag','MLabel','String',' 42^{\circ} W',...
     'Position',[0.190434157674866 0 3],...
     'HorizontalAlignment','center');

% Create text
text('Parent',axes1,'Tag','PLabel','String',' 0^{\circ}',...
     'Position',[-0.196084210602486 0 3],...
     'HorizontalAlignment','right');

% Create text
text('Parent',axes1,'Tag','PLabel','String',' 2^{\circ} N',...
     'Position',[-0.196084210602486 0.0347234753188049 3],...
     'HorizontalAlignment','right');

% Create text
text('Parent',axes1,'Tag','PLabel','String',' 4^{\circ} N',...
     'Position',[-0.196084210602486 0.0694893160703188 3],...
     'HorizontalAlignment','right');

% Create text
text('Parent',axes1,'Tag','PLabel','String',' 6^{\circ} N',...
     'Position',[-0.196084210602486 0.104340146681287 3],...
     'HorizontalAlignment','right');

% Create text
text('Parent',axes1,'Tag','PLabel','String',' 8^{\circ} N',...
     'Position',[-0.196084210602486 0.139319113442038 3],...
     'HorizontalAlignment','right');

% Create title
title('Map of South America showing Guyana, digital elevation data at 30
second (1km) resolution (GTOPO30).');

% Create colorbar
colorbar('peer',axes1);

% Create textbox
annotation('figure1','textbox',...
    [0.427278409090909 0.0533751962323391 0.0414715909090908
0.0465724751439037],...
    'String',{'Latitude'},...
    'FitBoxToText','off',...

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        'LineStyle','none');

% Create textbox
annotation(figure1,'textbox',...
    [0.0275625 0.532182103610675 0.05134375 0.0376766091051806],...
    'String',{'Longitude'},...
    'FitBoxToText','off',...
    'LineStyle','none');

% Create textbox
annotation(figure1,'textbox',...
    [0.846951704545455 0.0176936159079016 0.118673295454546
0.0803571428571427],...
    'String',{'Elevation (m)'},...
    'FitBoxToText','off',...
    'LineStyle','none');

```