

2003/12/18

■ Ts-NDVI hodograph preparation for China

```
<<Utilities`BinaryFiles`
<<Statistics`DataManipulation`
<<Statistics`ContinuousDistributions`

<<Graphics`Graphics`
```

```
array = Table[Byte, {3600}, {3600}];
```

■ China's north-east area large cities

```
{{長春, 43.52, 125.2}, {瀋陽, 41.47, 123.24}, {哈爾濱, 45.45, 126.38}} (* degree.minute *)
```

```
{{長春, 43.9, 125.}, {瀋陽, 41.8, 123.4}, {哈爾濱, 45.75, 126.6}} (* converted to degree *)
```

```
obihiro = {42.0 + 55/60., 143. + 13/60.};
```

```
tyoushun = {43.9, 125.};
```

```
shinyo = {41.8, 123.4};
```

```
harupin = {45.75, 126.6};
```

■ functions to prepare box in the map, to get pixel number from latitude & longitude, to set a box size +/- 1 pixels,

```
latlon2N[loc_] := (
  lat = loc[[1]];
  lon = loc[[2]];
  {Ceiling[(lat - 40) / (50. - 40.) * 120] + 1, Ceiling[(lon - 120) / (145. - 120.) * 300] + 1}
)
```

```
makeBox[pos_] := Reverse[Transpose[{pos - 2, pos + 2}]];
```

```
makeBox[{10, 20}]
```

```
{{18, 22}, {8, 12}}
```

```

getLocalNDVI[p_]:=
  If[ListQ[p]==False,Print["nosuch location"];Return[]];
  x=p[[1]];y=p[[2]];
  ndviLocal=Flatten[Transpose[Take[Transpose[Take[area,y]],x]]];
  (* Delete sea, where 0, area*)
  ndviLocal=Delete[ndviLocal,Position[ndviLocal,0]];
  (* NDVI minimum should be 100 excepting another conditions make ch1<ch2 *)
  ndviLocal=ReplacePart[ndviLocal,100,Position[ndviLocal,_?(<100&)]];
  (* obtain mean value and normalized total NDVI *)
  Mean[ndviLocal//N])

latitude= {39.8129, 40.9343, 42.0558, 43.1773,
  44.2988, 45.4203, 46.5418, 47.6632, 48.7847, 49.9062, 51.0277};
longitude= Table[i, {i, 119.25, 145.125, 1.125}];

myDirectory="/Volumes/PBG4/LaCie Backup/NDVI2000";
SetDirectory[myDirectory];

```

```

localP=obihiro;(* provision of latitude and longitude *)
tsPrNDVI={};

Do[
(
  ndviFile="2000-ndvi.raw/00"<>If[i<10,"0"<>ToString[i],ToString[i]]<>"-ndvi.raw";
  sbyte = OpenRead[ndviFile];
  a = Read[sbyte, array];
  Close[sbyte];

  a1 = Reverse[a];
  b = Take[a1, {2401, 3600, 10}];
  b1 = Transpose[b];
  b2 = Take[b1, {1, 3000, 10}];
  area = Transpose[b2];
  localPix=latlon2N[localP];
  box=makeBox[localPix];
  nd=getLocalNDVI[box];

  tempFile="sfc2temp/00"<>If[i<10,"0"<>ToString[i],ToString[i]]<>"_sfc2t";
  sktsfc = Partition[ReadListBinary[tempFile,Single], 24];

  approx = ListInterpolation[sktsfc,{latitude, longitude}];
  latp=localP[[1]];lonp=localP[[2]];
  ts = approx[latp, lonp];

  prepFile="precipitation/00"<>If[i<10,"0"<>ToString[i],ToString[i]]<>"_prep";
  prep = Partition[ReadListBinary[prepFile,Single], 24]*10;

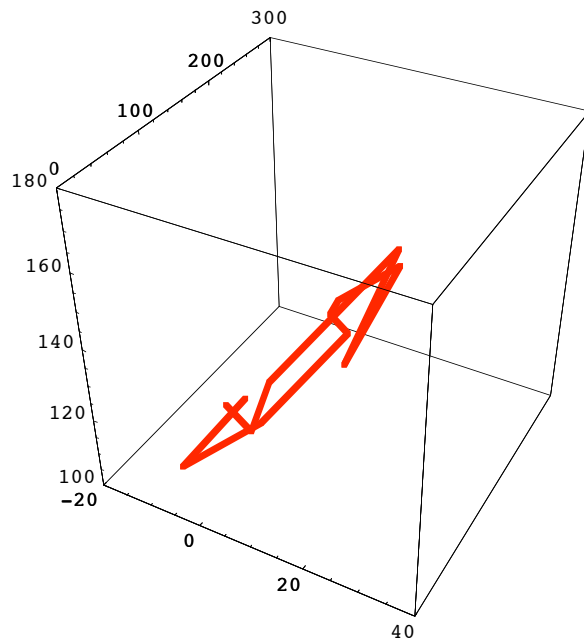
  approx = ListInterpolation[prep,{latitude, longitude}];
  latp=localP[[1]];lonp=localP[[2]];
  ps = approx[latp, lonp];

  tsPrNDVI=Append[tsPrNDVI,{ts,ps,nd}];
)
,{i,1,12}]

```

<<Graphics`Graphics3D`

```
gg1=ScatterPlot3D[tsPrNDVI,PlotRange->{{-20,40},{0,300},{100,180}},BoxRatios{1,1,1},PlotJoined->True,PlotStyle->{Thickness[0.01],Hue[0.0]}];
```



```
tsPr=Transpose[ReplacePart[Transpose[tsPrNDVI],Table[100,{12}],3]];
tsNDVI=Transpose[ReplacePart[Transpose[tsPrNDVI],Table[300,{12}],2]];
prNDVI=Transpose[ReplacePart[Transpose[tsPrNDVI],Table[40,{12}],1]];

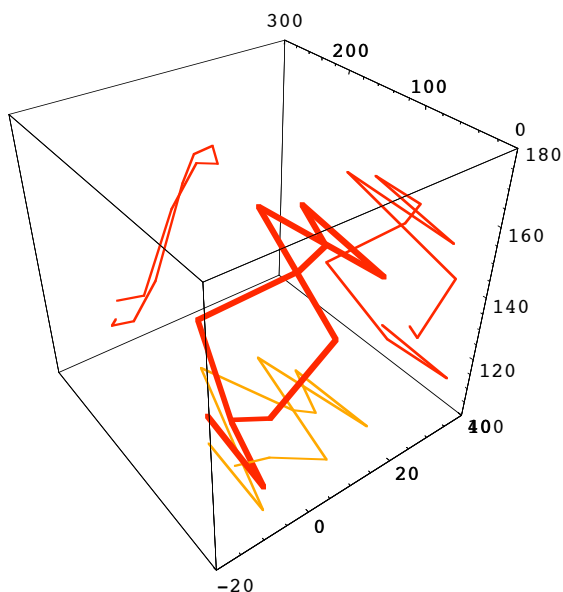
```

```
gtsPr=ScatterPlot3D[tsPr,PlotRange->{{-20,40},{0,300},{100,180}},BoxRatios{1,1,1},PlotJoined->True,PlotStyle->{Thickness[0.005],Hue[0.1]},DisplayFunction->Identity];
```

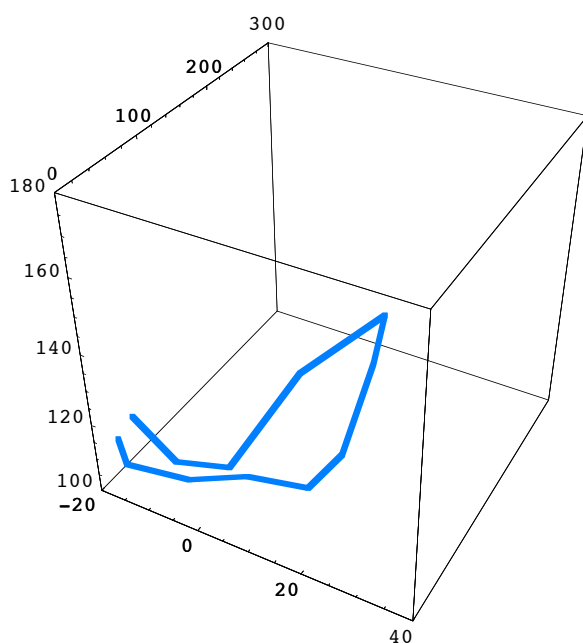
```
gtsNDVI=ScatterPlot3D[tsNDVI,PlotRange->{{-20,40},{0,300},{100,180}},BoxRatios{1,1,1},PlotJoined->True,PlotStyle->{Thickness[0.005],Hue[0.0]},DisplayFunction->Identity];
```

```
gPrNDVI=ScatterPlot3D[prNDVI,PlotRange->{{-20,40},{0,300},{100,180}},BoxRatios{1,1,1},PlotJoined->True,PlotStyle->{Thickness[0.005],Hue[0.0]},DisplayFunction->Identity];
```

```
gObihiro=Show[gg1,gtsPr,gtsNDVI,gPrNDVI,ViewPoint->{-1.217,1.648,
1.501},DisplayFunction->$DisplayFunction];
```



```
gg1=ScatterPlot3D[tsPrNDVI,PlotRange->{{-20,40},{0,300},{100,180}},BoxRatios {1, 1,
1},PlotJoined->True,PlotStyle-> {Thickness[0.01],Hue[0.6]};
```



```
tsPr=Transpose[ReplacePart[Transpose[tsPrNDVI],Table[100,{12}],3]];
tsNDVI=Transpose[ReplacePart[Transpose[tsPrNDVI],Table[300,{12}],2]];
prNDVI=Transpose[ReplacePart[Transpose[tsPrNDVI],Table[40,{12}],1]];

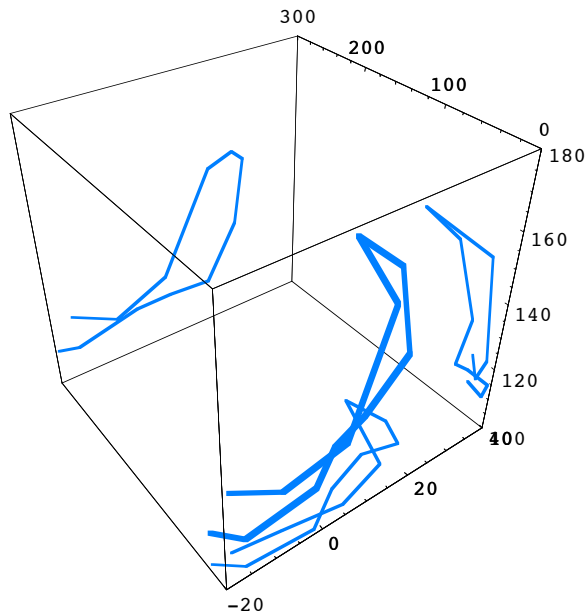
```

```
gtsPr=ScatterPlot3D[tsPr,PlotRange->{{-20,40},{0,300},{100,180}},BoxRatios {1, 1,
1},PlotJoined->True,PlotStyle-> {Thickness[0.005],Hue[0.6]},DisplayFunction->Identity];
```

```
gtsNDVI=ScatterPlot3D[tsNDVI,PlotRange->{{-20,40},{0,300},{100,180}},BoxRatios {1,
1, 1},PlotJoined->True,PlotStyle-> {Thickness[0.005],Hue[0.6]},DisplayFunction->Identity];
```

```
gPrNDVI=ScatterPlot3D[prNDVI,PlotRange->{{-20,40},{0,300},{100,180}},BoxRatios{1,
1, 1},PlotJoined->True,PlotStyle-> {Thickness[0.005],Hue[0.6]},DisplayFunction->Identity];
```

```
gtyoushun=Show[gg1,gtsPr,gtsNDVI,gPrNDVI,ViewPoint->{-1.217,1.648,
1.501},DisplayFunction->$DisplayFunction];
```



```
Show[gObihiro,gtyoushun];
```

