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/** ----- An early attempt at applying logistic regression -----
/** FILE NAME:      Logit Regres.txt
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/** CREATED:       13 NOVEMBER 2009
/**
/** The scripts may be supplied in a more readily useable format if the work is acknowledged
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/**
/** INPUT GRIDS:    dembounds      dem25int      slopeint      aspectint
/**                  rain98av      rain98max      lcdb2grid     geolgrid
/**                  soilsgrid      faultgrid     rivergrid
/**
/** OUTPUT GRIDS:      PrEvent          Z
/** NOTES:            Variables were only used for setting beta values. The setting of other
/**                  variables made this scripted process a nuisance to have to update.
/**                  The Factors and beta values listed in this script are from an earlier model in
/**                  an earlier trial in this study. The intercept was applied to Dembounds which
/**                  is just the Waikato region boundary, so the same value is present in every
/**                  25 m x 25 m pixel.
/**
/**
/** *****

```

Workspace D:\Renee_GIS\Output_data\Organised\15_Multi_Reg

```

&SETVAR .B0 = 5.01798655286348      /* (p1) Intercept
&SETVAR .B1 = -0.0241662451504076  /* (p2) Slope
&SETVAR .B2 = -0.00130593083256235 /* (p3) Aspect
&SETVAR .B3 = 0.00498857408315768  /* (p4) Elevation
&SETVAR .B4 = -0.0319081177051872  /* (p5) Max Rain
&SETVAR .B5 = 0.181553187675869    /* (p6) Land Cover
&SETVAR .B6 = -0.0453798714509435  /* (p7) Lithology
/*&SETVAR .B7 =      /* (p8)
/*&SETVAR .B8 =      /* (p9)
/*&SETVAR .B9 =      /* (p10)
/*&SETVAR .B10 =     /* (p11)

```

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&CALL Betas
&CALL Logit
&CALL Kill_Temp

```

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&RETURN

```

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/** *****
&ROUTINE Betas

```

```
&CALL 6_Variables
/*&CALL 9_Variables
&RETURN
```

```
/******
&ROUTINE 6_variables
```

```
&CALL Setup_Grid
```

```
B0GRID = (D:\Renee_GIS\Output_data\Organised\03_DEM\dembounds * %.B0%)
B1Grid = (D:\Renee_GIS\Output_data\Organised\03_DEM\slopeint * %.B1%)
B2Grid = (D:\Renee_GIS\Output_data\Organised\03_DEM\aspectint * %.B2%)
B3Grid = (D:\Renee_GIS\Output_data\Organised\03_DEM\dem25int * %.B3%)
B4Grid = (D:\Renee_GIS\Output_data\Organised\13_Rain\rain98max * %.B4%)
B5Grid = (D:\Renee_GIS\Output_data\Organised\07_LandCover\lcdb2grid * %.B5%)
B6Grid = (D:\Renee_GIS\Output_data\Organised\05_Geology\geolgrid * %.B6%)
```

```
Z = (B0GRID + B1Grid + B2Grid + B3Grid + B4Grid + B5Grid + B6Grid)
SETMASK OFF
Q
&RETURN
```

```
/******
&ROUTINE 9_variables
```

```
&CALL Setup_Grid
```

```
B0GRID = (D:\Renee_GIS\Output_data\Organised\03_DEM\dembounds * %.B0%)
B1Grid = (D:\Renee_GIS\Output_data\Organised\03_DEM\slopeint * %.B1%)
B2Grid = (D:\Renee_GIS\Output_data\Organised\03_DEM\aspectint * %.B2%)
B3Grid = (D:\Renee_GIS\Output_data\Organised\03_DEM\dem25int * %.B3%)
B4Grid = (D:\Renee_GIS\Output_data\Organised\13_Rain\rain98av * %.B4%)
B5Grid = (D:\Renee_GIS\Output_data\Organised\13_Rain\rain98max * %.B5%)
B6Grid = (D:\Renee_GIS\Output_data\Organised\07_LandCover\lcdb2grid * %.B6%)
B7Grid = (D:\Renee_GIS\Output_data\Organised\05_Geology\geolgrid * %.B7%)
B8Grid = (D:\Renee_GIS\Output_data\Organised\06_Soil\soilsgrid * %.B8%)
B9Grid = (D:\Renee_GIS\Output_data\Organised\10_Faults\faultgrid * %.B9%)
B10Grid = (D:\Renee_GIS\Output_data\Organised\12_Rivers\rivergrid * %.B10%)
```

```
Z = (B0GRID + B1Grid + B2Grid + B3Grid + B4Grid + B5Grid + B6Grid + B7Grid + B8Grid + B9Grid +
B10Grid)
SETMASK OFF
Q
&RETURN
```

```
/******
&ROUTINE Logit
```

```
&IF [EXIST PrEvent -GRID] &THEN KILL PrEvent ALL
&CALL Setup_Grid
```

PrEvent = (1 / (1 + (EXP(Z))))

SETMASK OFF

Q

&RETURN

/*****

&ROUTINE Kill_Temp

&IF [EXIST B0Grid -GRID] &THEN KILL B0Grid ALL

&IF [EXIST B1Grid -GRID] &THEN KILL B1Grid ALL

&IF [EXIST B2Grid -GRID] &THEN KILL B2Grid ALL

&IF [EXIST B3Grid -GRID] &THEN KILL B3Grid ALL

&IF [EXIST B4Grid -GRID] &THEN KILL B4Grid ALL

&IF [EXIST B5Grid -GRID] &THEN KILL B5Grid ALL

&IF [EXIST B6Grid -GRID] &THEN KILL B6Grid ALL

&IF [EXIST B7Grid -GRID] &THEN KILL B7Grid ALL

&IF [EXIST B8Grid -GRID] &THEN KILL B8Grid ALL

&IF [EXIST B9Grid -GRID] &THEN KILL B9Grid ALL

&IF [EXIST B10Grid -GRID] &THEN KILL B10Grid ALL

&IF [EXIST Z -GRID] &THEN KILL Z ALL

&RETURN

/*****

&ROUTINE Setup_Grid

&RUN D:\renee_gis\scripts\checkproggrid.txt

&TYPE set window to rain98av...

SETWINDOW D:\Renee_gis\output_data\Organised\13_Rain\rain98av

&TYPE Set mask to rain98av...

&RETURN

SETMASK D:\Renee_gis\output_data\Organised\13_Rain\rain98av

&RETURN