


```

/**
/**
ADDITIONAL FUNCTIONS USED
/**
IN SUPPORTING SCRIPTS:          BUFFER          (In 04a_Create.txt)
/**
/**
PURPOSE:      To combine the QMAP Landslide spatial data with the transformed
/**
GeoNet spatial data. The GeoNet data was obtained as an Excel
/**
Database, and has been imported into an Access and CSV files, and
/**
converted to shapefile. The Regions and District were determined
/**
based on existing spatial data, which also aided in determining where
/**
different coordinate systems may have been used for other regions. The
/**
data is limited to a point type but this script deal to that (following
/**
conversion from shapefile to cover - 01_convert.txt) by individually
/**
buffering the points by their RADIUS value, weeding out those that have
/**
none, specifying attributes for that point and unioning to obtain a
/**
singular cover of the buffered GeoNet points which is then unioned with
/**
the GNS QMAP landslide polygons to make the Landslide layer.
/**
NOTES ON ROUTINES:
/**
CREATE:      A loop which runs the Loop_create.txt script from AUTO_ID = 1
/**
until the upper limit variable is met. Loop_Create.txt creates
/**
individual buffer covers for each Auto_ID and adds a couple of
/**
attributes (Auto_ID, Year, Loc_Class numbered as that AUTO_ID).
/**
The buffer distance is determined by the RADIUS_M attribute, for
/**
some AUTO_IDs (18, 19, 36-41) this value is 0 and will cause the
/**
process to fall over, these have been caught and copies made, then
/**
excluded in the rest of the analysis.
/**
UNION:      Union all layers together (currently in order of AUTO_ID) with
/**
some ways to get around the AUTO_IDs that weren't buffered.
/**
The first step is to skip AUTO_ID = 1 and Union at AUTO_ID = 2
/**
All subsequent unions should follow a case of unioning with the
/**
previously made union cover which can be looped. The exception is
/**
that the covers that did not get buffered (zero radius) have to be
/**
caught in &IF &THEN statements where the AUTO_ID variable is
/**
increased by 1, where these are false the &ELSE will run the looped
/**
process which will execute the Loop_union.txt script.
/**
COMPILE:      Go through the attributes in the final unioned cover and compile
/**
into one attribute column before dropping these columns (the ones
/**
added in the create routine and a few others). Loop_compile.txt is
/**
run through a looped process.
/**
DESTROY:      Kill all intermediate covers and free up a lot of hard drive space by
/**
running loop_destroy.txt script in a looped process.
/**
----- HISTORY-----
/**
15 DECEMBER 2008      3_clip.txt individual clip script created specifically to be run from a
/**
master script as part of the processing of parameters for Waikato
/**
region. Important to check input exists before processing.
/**
12 FEBRUARY 2009      (3_clip.txt) Can now clip with the digitised regional boundary I made

```

/**		(which has a more representative coast line than the EW one) based
/**		on the district boundaries layer and cut off points based on the EW
/**		layer.
/**	03 MARCH 2009	Created looptest.txt
/**	04 MARCH 2009	Modified and updated variables and use of variables
/**	05 MARCH 2009	Created copy of looptest.txt, named Loop_master.txt
/**	18 MARCH 2009	Modified loop_create.txt (tidied up and added routines)
/**	19 MARCH 2009	Modified this script's Compile Routine to go through a set of loops
/**		to write items according to size order (Loc_class) so C then B, then A
/**		(Auto_ID 1 = A, and is last). Fixed Compile - no longer a loop now use
/**		long_compile.txt script. MADE DROPITEM a loop, had some issues
/**		but looks to work for test sample of 20. Destroy script has been
/**		modified the &IF &THEN &ELSE statement is now two &IF &THEN
/**		statements and no &ELSE. All seems to work for test sample.
/**		RUN ALL SAMPLES starting 6:24pm
/**	20 MARCH 2009	Ran out of hard drive space, have now made it delete covers
/**		after it's done using them instead of all at the end. These Kill
/**		statements were added to loop_union.txt in new routines, and in
/**		this script's union routine. Added kill statement added to
/**		loop_create.txt after copy and buffer.
/**	23 MARCH 2009	Created loop_master2.txt (copy of loop_master.txt) which adds
/**		more columns instead of just four. Have added more columns to
/**		distinguish groupings when there are overlaps. Now there are
/**		columns for each radius distance, location class, year and year plus
/**		auto_ID. It also runs long_compile2.txt which is a modified copy of
/**		long_compile.txt
/**	24 MARCH 2009	Do not need 23 columns for radius when not all overlap. Now
/**		reduced to 9. Have modified the number of columns added in
/**		loop_master2.txt and in long_compile2.txt so that they actually
/**		write to an existing column.
/**	29 MARCH 2009	MADE the GeoNet stuff into a routine (GEONET_LS_Cat)
/**		Added QMAP Routine and UNION_BOTH routine.
/**	30 MARCH 2009	Have added this script to 00_MASTER.txt to be run through the
/**		LS_Inventory routine. Removed Destroy Routine as included in other
/**		parts of script. Tidied up script, got rid of redundant scripting. Seems
/**		to work. Added clip landslides to make w_landslides in 04_Clip.txt
/**	15 APRIL 2009	Changed name from loop_master2.txt to 03_Inventory.txt
/**	27 APRIL 2009	Check script is consistent with others, update script information.
/**		Have changed the name of two coverages made (GEONETLSIW3 is
/**		now GeoNetLSIW, while GEONETLSIW4 is now W_GeoNet_LSI)
/**		Have renamed two of the scripts used (Long_Compile2.txt is now
/**		Long_Compile.txt, and DROPITEMS2.txt is now Loop_DropItem.txt).
/**	28 APRIL 2009	Added radius_limit routine/call to try weed out polygons with radii
/**		too large.
/**	30 APRIL 2009	First attempt to rasterise vector data using POLYGRID, created
/**		15_Rasterise.txt.
/**	31 APRIL-05 MAY 2009	The w_landslides layer converted to GRID excellently.
/**	12 MAY 2009	Added the KILL_NULL routine to kill temporary layers no longer
/**		needed
/**	20 MAY 2009	Separate Input data and output data directories, so workspace is set
/**		to a separate output folder, so reduces the chance of deleting input

```

/**
/**      10 JUNE 2009      data by accident.
/**      Renamed 03_Inventory as 04_inventory.txt as The DEM procedure
/**      has to go before this. Renamed loop_create.txt, loop_union.txt, /**
/**      long_compile.txt and loop_Droptem to 04a_Create.txt,
/**      04b_Union.txt, 04c_Compile.txt and 04d_Droptem.txt respectively.
/**      Have modified this script's &RUN commands to match these
/**      changes. Have added the landslides clip process from 04_Clip.txt
/**      and the rasterise process from 15_Rasterise.txt.
/**      *****
/**      *****

```

```

&CALL GEONET_LS_Cat
&CALL QMAP_LSI
&CALL UNION_BOTH
&CALL KILL_NULL
&CALL CLIP
&CALL RASTERISE

```

```

&RETURN

```

```

/**      *****
/**      *****
/**      GeoNet_LS_Cat      Multi-Loop Process      **
/**      *****

```

```

&ROUTINE GEONET_LS_Cat
/** NOW to work through the GEONET Landslide Category

```

```

/*SET VARIABLES

```

```

&SETVAR .AUTO_ID = 1
&SETVAR .UPPER_LIMIT = 124      /* FOR ALL TO BE PROCESSED SET UPPER LIMIT TO
NUMBER OF COVERAGES + 1 (i.e. 124)
/*&SETVAR .UPPER_LIMIT = 21      /* FOR TEST RUNS SET UPPER LIMIT VARIABLE
&SETVAR .LAST_COVER = %.UPPER_LIMIT% - 1 /* LAST_COVER IS THE .UPPER_LIMIT MINUS ONE
USES THIS IN THE COMPILE PROCESS

```

```

/* LIST OF CALLS...

```

```

&CALL CREATE
&CALL UNION      /* Union buffer coverages (can only union polygons!) have configured
exceptions
&CALL COMPILE      /* Gave up on looping, went the long way and listed all edits in the
order I want them.
&CALL DROP_ITEMS      /* Loop process to drop items brought in by the union stage.
&CALL Radius_Limit

```

```

&RETURN

```

```

/*****
/**                               GeoNet_LS_Cat SUB-ROUTINES                               **
/*****

```

&ROUTINE CREATE

```

&SETVAR .AUTO_ID = 1
&TYPE running CREATE loop...
&DO &UNTIL %.AUTO_ID% = %.UPPER_LIMIT%
&TYPE NOW UP TO: %.AUTO_ID% OF %.LAST_COVER%
&RUN d:\renee_gis\scripts\04a_Create.txt
&SETVAR .AUTO_ID = %.AUTO_ID% + 1
&END
&RETURN

```

```

/*-----
&ROUTINE UNION

```

&TYPE running UNION loop...

/** First reset the variable and then check any files made in this part are deleted in order to continue.

```

&SETVAR .AUTO_ID = 1
&SETVAR .UPPER_LIMIT = 124
/*&SETVAR .UPPER_LIMIT = 21
&SETVAR .LAST_COVER = %.UPPER_LIMIT% - 1

```

&IF [EXIST WLSI_1_to_2 -COVER] &THEN KILL WLSI_1_to_2 ALL

/** If Auto_ID is equal to 1 or 2 need to single out in order to create the first union layer and then can loop the process

```

&DO &UNTIL %.AUTO_ID% = %.LAST_COVER%
&if [exist WLSI_1_to_%.AUTO_ID% -cover] &THEN KILL WLSI_1_to_%.AUTO_ID% ALL

```

/** HERE I am singling out Auto_Id = 1 and basically telling it to skip to the next Auto_ID

```

&TYPE Now up to: %.AUTO_ID% OF %.LAST_COVER%
&IF %.AUTO_ID% = 1 &THEN
&SETVAR .AUTO_ID = %.AUTO_ID% + 1

```

/** HERE I am singling out the first two Auto_IDs and telling it to make the first union cover from this point the process should be able to loop

&TYPE Now up to: %.AUTO_ID% OF %.LAST_COVER%

```

&IF %.AUTO_ID% = 2 &THEN
UNION LSIW_buff_1 LSIW_buff_2 WLSI_1_to_%.AUTO_ID%
KILL LSIW_buff_1
KILL LSIW_buff_2
&SETVAR .AUTO_ID = %.AUTO_ID% + 1

/** HERE the loop is put into action for Auto_IDS greater than or Equal to 3. The process is run from
the
/** 04b_union.txt script. Have to weed out the non-existant buffer layers (18, 19, 36-41).

&IF %.AUTO_ID% = 18 &THEN
&SETVAR .AUTO_ID = %.AUTO_ID% + 1

&IF %.AUTO_ID% = 19 &THEN
&SETVAR .AUTO_ID = %.AUTO_ID% + 1

&IF %.AUTO_ID% GE 36 AND %.AUTO_ID% LE 41 &THEN
&SETVAR .AUTO_ID = %.AUTO_ID% + 1

&ELSE
&DO &WHILE %.AUTO_ID% LE %.LAST_COVER%
&RUN d:\renee_gis\scripts\04b_Union.txt
&SETVAR .AUTO_ID = %.AUTO_ID% + 1
&END
&RETURN

/*-----
&ROUTINE COMPILE

&TYPE running COMPILE...

/** check the copy GEONETLSIW does not already exist from a previous trial and delete if it does
before creating it again
&IF [EXIST GeoNetLSIW -COVER] &THEN KILL GeoNetLSIW
COPY WLSI_1_to_%.LAST_COVER% GeoNetLSIW

/** Add new columns to GeoNetLSIW for Auto_ID, Year, and Loc_class.
&TYPE Adding columns to GeoNetLSIW...

ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Rad_25km 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Rad_12km_20km 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Rad_10km 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Rad_6500m_8km 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Rad_3500m_6km 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Rad_2km_2500m 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Rad_1km_1500m 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Rad_10m_500m 10 10 I

ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat YR_1996 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat YR_1997 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat YR_1998 10 10 I

```

```

ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat YR_1999 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat YR_2000 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat YR_2001 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat YR_2002 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat YR_2003 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat YR_2004 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat YR_2005 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat YR_2006 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat YR_2007 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat YR_2008 10 10 I

ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Y96_AutoID 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Y97_AutoID 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Y98_AutoID 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Y99_AutoID 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Y00_AutoID 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Y01_AutoID 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Y02_AutoID 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Y03_AutoID 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Y04_AutoID 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Y05_AutoID 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Y06_AutoID 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Y07_AutoID 10 10 I
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat Y08_AutoID 10 10 I

ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat LocClass_A 10 10 C
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat LocClass_B 10 10 C
ADDITEM      GeoNetLSIW.pat GeoNetLSIW.pat LocClass_C 10 10 C

```

```

&RUN D:\renee_gis\scripts\04c_Compile.txt
&RETURN

```

```

/*-----
&ROUTINE DROP_ITEMS
&SETVAR .AUTO_ID = 1
&SETVAR .UPPER_LIMIT = 124
/*&SETVAR .UPPER_LIMIT = 21
&SETVAR .LAST_COVER = %.UPPER_LIMIT% - 1

&IF [EXIST W_GeoNet_LSI -COVER] &THEN KILL W_GeoNet_LSI
COPY GeoNetLSIW W_GeoNet_LSI

&TYPE Have set .AUTO_ID to %.AUTO_ID% should be 1

DROPITEM W_GeoNet_LSI.pat W_GeoNet_LSI.pat LSIW_BUFF_1# LSIW_BUFF_2#
DROPITEM W_GeoNet_LSI.pat W_GeoNet_LSI.pat LSIW_BUFF_1-ID LSIW_BUFF_2-ID

&DO &WHILE %.AUTO_ID% LT %.LAST_COVER%
&TYPE Now up to: %.AUTO_ID% OF %.LAST_COVER%

&IF %.AUTO_ID% = 18 &THEN

```

```
&SETVAR .AUTO_ID = %.AUTO_ID% + 1
```

```
&IF %.AUTO_ID% = 19 &THEN
```

```
&SETVAR .AUTO_ID = %.AUTO_ID% + 1
```

```
&IF %.AUTO_ID% GE 36 AND %.AUTO_ID% LE 41 &THEN
```

```
&SETVAR .AUTO_ID = %.AUTO_ID% + 1
```

```
&ELSE
```

```
&RUN d:\renee_gis\scripts\04d_DropItem.txt
```

```
&SETVAR .AUTO_ID = %.AUTO_ID% + 1
```

```
&END
```

```
DROPITEM W_GeoNet_LSI.pat W_GeoNet_LSI.pat AUTO_ID123 YEAR 123 LOC_CLASS123
```

```
&RETURN
```

```
/*-----
```

```
&ROUTINE Radius_Limit
```

```
/* set maximum radius of the GeoNet layer (i.e. delete all polygons beyond that radius)
```

```
&SETVAR .Radius_Val = 2500
```

```
&IF %.Radius_Val% LE 2500 &THEN
```

```
&DO
```

```
&RUN D:\renee_gis\scripts\CheckProgEdit.txt
```

```
EC W_GeoNet_LSI
```

```
EF polygon
```

```
SELECT for Rad_10m_500m = 0 and Rad_1km_1500m = 0 and Rad_2km_2500m = 0
```

```
DELETE
```

```
SAVE
```

```
Q
```

```
DROPITEM W_GeoNet_LSI.pat W_GeoNet_LSI.pat Rad_25km Rad_12km_20km Rad_10km
```

```
Rad_6500m_8km Rad_3500m_6km
```

```
&END
```

```
&RETURN
```

```
/******
```

```
/** Remaining Main Routines **
```

```
/******
```

```
&ROUTINE QMAP_LSI
```

```
/* JOIN QMAP landslide coverages for Auckland and Waikato.
```

```
&IF [EXIST QMAP_Landsl -COVER] &THEN KILL QMAP_Landsl
```



```
COPY d:\renee_gis\input_data\GNS_QMAP\Auckland\covers\landslides qmap_a_landsl
COPY d:\renee_gis\input_data\GNS_QMAP\Waikato\covers\landslides qmap_w_landsl
```

```
UNION qmap_w_landsl qmap_a_landsl QMAP_Landsl
```

```
&IF [EXIST qmap_a_landsl -COVER] &THEN KILL qmap_a_landsl
&IF [EXIST qmap_w_landsl -COVER] &THEN KILL qmap_w_landsl
```

```
DROPITEM QMAP_Landsl.pat QMAP_Landsl.pat MAIN_ROCK SUB_ROCKS MAP_UNIT STRAT_UNIT
DROPITEM QMAP_Landsl.pat QMAP_Landsl.pat SEQUENCE TERRANE STRAT_AGE ABS_MIN
ABS_MAX
DROPITEM QMAP_Landsl.pat QMAP_Landsl.pat CONFIDENCE DESCRIPTION ROCK_GROUP
ROCK_CLASS
```

```
&RETURN
```

```
/*****
```

```
&ROUTINE UNION_BOTH
/* Join QMAP landslide inventory with buffered Geonet landslide catalog.
```

```
&IF [EXIST Landslides -COVER] &THEN KILL Landslides
UNION W_GeoNet_LSI qmap_landsl Landslides
```

```
&IF [EXIST W_GeoNet_LSI -COVER] &THEN KILL W_GeoNet_LSI
&IF [EXIST qmap_landsl -COVER] &THEN KILL qmap_landsl
```

```
&RUN d:\renee_gis\scripts\CheckProgEdit.txt
```

```
EC Landslides
EF polygon
SELECT ALL
CALCULATE INSIDE = 1
SAVE
Q
```

```
&RETURN
```

```
/*****
```

```
&ROUTINE KILL_NULL
```

```
&IF [EXIST LSIW_RADIO_18 -COVER] &THEN KILL LSIW_RADIO_18
&IF [EXIST LSIW_RADIO_19 -COVER] &THEN KILL LSIW_RADIO_19
&IF [EXIST LSIW_RADIO_36 -COVER] &THEN KILL LSIW_RADIO_36
&IF [EXIST LSIW_RADIO_37 -COVER] &THEN KILL LSIW_RADIO_37
&IF [EXIST LSIW_RADIO_38 -COVER] &THEN KILL LSIW_RADIO_38
&IF [EXIST LSIW_RADIO_39 -COVER] &THEN KILL LSIW_RADIO_39
&IF [EXIST LSIW_RADIO_40 -COVER] &THEN KILL LSIW_RADIO_40
&IF [EXIST LSIW_RADIO_41 -COVER] &THEN KILL LSIW_RADIO_41
```

```
&IF [EXIST wlsi_1_to_123 -COVER] &THEN KILL wlsi_1_to_123
```

```
&IF [EXIST GeoNetLSIW -COVER] &THEN KILL GeoNetLSIW  
&RETURN
```

```
/*****
```

```
&ROUTINE CLIP
```

```
&IF [EXIST w_landslides -cover] &THEN KILL w_landslides
```

```
CLIP Landslides DEM_Bnd w_landslides
```

```
&IF [EXIST Landslides -cover] &THEN KILL Landslides
```

```
&TYPE Landslides clipped
```

```
&RETURN
```

```
/*****
```

```
&ROUTINE RASTERISE
```

```
&IF [EXIST Landslgrid -GRID] &THEN KILL Landslgrid ALL
```

```
POLYGRID w_landslides Landslgrid INSIDE
```

```
25
```

```
y
```

```
&RETURN
```