Appendix A
Map Unit Field Code Key Table for Mn/Model

MAP UNIT FIELD CODE KEY TABLE FOR Mn/MODEL v. 5.0
(last modified June 30, 2009)

GEOMORPHIC FIELD CODES

Can be supplemented with USGS Digital Elevation Data layer and its derivative layers (Slope; Relative Elevation; Surface Roughness). Also can be supplemented with MPCA Stream Order layer, although this is a coarser scale than Code No. 10.

Code Number and Title (GIS FIELD)	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
CODE NO. 1 GEOMORPHIC REGION (GEOM_REG1)				Polygons can be adapted from editing the DNR GIS Minnesota Geomorphology coverage or created by new landform-sediment assemblage mapping for Mn/Model.
	No Distinction Made	NO_DIST	*	
	Glacial Lobe	GLA_LOB	L	
	Glacial Lake Plain	GLA_LAK	P	
	Glaciofluvial Valley	GLF_VAL	V	
	Glacial-Scoured Bedrock Terrain	GLA_SBRT	B	
	Bedrock Terrain	BRT	T	
CODE NO. 2 GEOMORPHIC REGION IDENTIFIER (REGION_ID2)				This code consists of the geographic or commonly used name for a **Geomorphic Region**.
	No Distinction Made	NO_DIST	*	
Glacial Lobe				
	Des Moines	DES	D	
	Grantsburg	GRANT	G	
	Koochiching	KOOCH	K	
	Pre-Wisconsinan	PRE_WI	P	
	Rainy	RAINY	Y	
	Red River	RED	R	
	St. Louis	STL	S	
	Superior	SUPER	X	
	Wadena	WADEN	W	

Code Number and Title (GIS FIELD)	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
Glacial Lake Plain				
	Lake Agassiz	LAK_AGA	LA	This value excludes the Beltrami Arm of Lake Agassiz.
	Lake Agassiz, Beltrami Arm	LAK_AGAB	LB	
	Lake Aitkin	LAK_AIT	LI	
	Lake Duluth	LAK_DUL	LD	
	Lake Upham	LAK_UPH	LU	
	Lake Minnesota	LAK_MIN	LM	
	Lake Benson	LAK_BEN	LE	
Glaciofluvial Valley				
	Glacial River Warren	RIV_WAR	VW	
	St. Croix River Valley	STC_VAL	VS	
	Mississippi River Valley	MIS_VAL	VM	
	Rum River Valley	RUM_VAL	VU	
	St. Louis River Valley	STL_VAL	VT	
	Sauk River Valley	SAK_VAL	VK	
Bedrock Terrain				
	Border Lakes Area	BORDER	BO	
	Giants Range	GIANT	GI	
	Mesabi Range	MESAB	ME	
CODE NO. 3 GEOMORPHIC SUB-REGION (GEOM_SUBR3)				Polygons can be adapted from editing the DNR GIS Minnesota Geomorphology coverage or created by new landform-sediment assemblage mapping for Mn/Model.
	No Distinction Made	NO_DIST	*	
	Ground Moraine	GRO_MOR	G	
	End Moraine	END_MOR	E	
	Beach (Level)	BEA_LEV	B	
	Eolian Dune Field	EOL_FLD	D	
	Drumlin Field	DRU_FLD	U	
	Outwash Plain	OUT_PLA	O	
	Paleo-Valley	PAL_VAL	Y	This value can include outwash, collapsed outwash, tunnel valley, glacial lake outlet, etc. cut during glacial activity.
	River Valley	RIV_VAL	R	

Code Number and Title (GIS FIELD)	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	Sand Plain	SAND_PLA	S	This value is descriptive (i.e., not genetic) for a sand plain of unknown or complex origin(s).
CODE NO. 4 GEOMORPHIC SUB-REGION IDENTIFIER (SUBREG_ID4)				This code consists of the geographic or commonly used name for a **Geomorphic Sub-Region**.
	No Distinction Made	NO_DIST	*	
Moraine				
	Alexandria	ALEX	AX	
	Algona	ALGO	AG	
	Altamont	ALTA	AL	
	Ann	ANN	AN	
	Bemis	BEMI	BE	
	Big Stone	BIGS	BS	
	Cloquet	CLOQ	CL	
	Culver	CULV	CU	
	Dent	DENT	DE	
	Erskine	ERSK	ER	
	Frazee	FRAZ	FR	
	Guthrie	GUTH	GU	
	Highland	HIGH	HI	
	Itasca	ITAS	IT	
	Knife	KNIF	KI	
	Mille Lacs	MILL	MI	
	Nashwauk	NASH	NA	
	Nemadji	NEMA	NE	
	Nickerson	NICK	NI	
	Outing	OUTI	OU	
	Pine City	PINE	PI	
	St. Croix	STCR	ST	
	Sugar Hills	SUGA	SU	
	Vermillion	VERM	VE	
Beach (Level)				
	Blanchard	BLAN	BL	

Code Number and Title (GIS FIELD)	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	Campbell	CAMP	CA	
	Emerado	EMER	EM	
	Herman	HERM	HE	
	Hillsboro	HILL	HI	
	Lower Campbell	LOCA	LO	
	McCauleyville	MCCA	MC	
	Norcross	NORC	NO	
	Ojata	OJAT	OJ	
	Tintah	TINT	TI	
Eolian Dune Field				
Drumlin Field				
	Wadena	WAD_DRU	WD	
	Toimi	TOI_DRU	TD	
	Pierz	PIE_DRU	PD	
	Brainerd	BRA_DRU	BD	
	Automba	AUT_DRU	AD	
Outwash Plain				
	Anoka Sand Plain	ANOKA	AK	The Anoka Sand Plain is generally considered an outwash or lake plain (Wright, 1972; Patterson, 1992; Meyer and Patterson, 1997). However, much of the area was subsequently modified by eolian processes forming dunes and possibly sand sheets.
	Park Rapids	PARK_OP	PR	
River Valley				
	Blue Earth Valley	BLU_VAL	BLU	
	Rainy River Valley	RAINY_VAL	RA	
	Red River Valley	RED_VAL	RE	
	Root River Valley	ROOT_VAL	RO	
	Rock River Valley	ROCK_VAL	RK	
	Rum River Valley	RUM_VAL	RU	
	Minnesota Valley	MINN_VAL	MN	The Minnesota Valley is separated from the geomorphically broader Glacial River Warren valley because it contains the bulk of the Holocene-aged sediments

Code Number and Title (GIS FIELD)	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	St. Croix Valley	STC_VAL	CRX	
	Sauk Valley	SAUK_VAL	SK	
	Upper Mississippi Valley - Headwaters Reach	MISS_HEAD	UMH	The headwaters region is typified by a series of lake basins interconnected by ancient outwash channels.
	Upper Mississippi Valley - Glacial Lake Aitkin Reach	MISS_AITKIN	UMA	The Mississippi River Valley cross-cuts the relatively flat Glacial Lake Aitkin basin.
	Upper Mississippi Valley - Brainerd to St. Cloud Reach	MISS_BRAIN	UMB	The Mississippi River Valley cross-cuts a broad outwash valley train.
	Upper Mississippi Valley - St. Cloud to Minnesota Valley Confluence	MISS_STCLD	UMS	
	Upper Mississippi Valley - Glacial River Warren Reach	MISS_WARREN	UMW	
	Upper Mississippi Valley - St. Croix Valley Confluence to Iowa Border	MISS_STCROIX	UMC	
CODE NO. 5 LANDSCAPE (LANDSCAPE5)				Landscapes that are composed of one or more related **Landforms**.
	No Distinction Made	NO_DIST	*	
	Upland, Undifferentiated	UPL_UNDIFF	U	
	Active Ice	ACT_ICE	I	
	Stagnant Ice	STAG_ICE	S	
	Ice Contact	ICE_CONT	N	
	Pediment	PEDIMENT	P	
	Glaciofluvial	OUTWASH	O	
	Catastrophic Flood	CAT_FLOOD	C	Kehew (1982)
	Glaciolacustrine	GLAC_LAC	A	
	Collapsed Sand Plain	C_SAND_PLA	D	This value is used for a sand plain of unknown or complex origin that exhibits the morphology of a buried, collapsed stagnant ice landscape.
	Collapsed Meltwater Trough	MELT_T	T	This value is applied to generally linear troughs and associated landforms formed by relict tunnel valleys (Wright, 1973).

Code Number and Title (GIS FIELD)	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	Meltwater Trough Fan	MELT_F	MF	This value is used for fans at the mouths of meltwater troughs, or tunnel valleys (Patterson, 1994). This value is at a scale worthy of mapping landforms within its extent.
	Paleo-Valley	PALEO_VAL	Y	
	Peatland	PEAT	B	
	Valley Terrace	VAL_TERR	V	
	Floodplain	FLOOD	F	
	Valley Margin	VAL_MARG	M	This value includes depositional forms at the foot of valley margin slopes and relatively steep sideslopes with sharply defined shoulder and footslope.
	Eolian	EOLIAN	E	
	Lacustrine	LAKE	L	*This value may include **River Lake** and river **Delta** landforms.*
CODE NO. 6 LANDSCAPE GEOGRAPHIC OR INFORMAL IDENTIFIER (LNDSCP_ID6)				This code consists of the geographic or commonly used name for a **Landscape** in a particular **Geomorphic Region** or **Geomorphic Sub-Region**.
	No Distinction Made	NO_DIST	*	
CODE NO. 7 LANDFORM (LANDFORM7)				This code consists of individual values of **Landscape** at a landform scale.
	No Distinction Made	NO_DIST	*	
	Alluvial Fan	FAN	AF	The morphologic transition between **Alluvial Fan** and **Colluvial Slope** can be gradational. In general, **Alluvial Fan** includes fan-shaped forms of mappable size. Smaller fans not practical to differentiate at the 1:24,000 scale of mapping, whether alluvial or colluvial, are included in the **Colluvial Slope** value. Where multiple **Alluvial Fan**s have coalesced, no attempt is made to differentiated individual fans.
	Arterial Drain Patterned Bog (Water Track)	ART_BOG	AB	See Glaser et al. (1981), Wright and Glaser (1983), and Eng (1980).
	Bar	BAR	B	This value is usually, but not exclusively, used in conjunction with the **Catastrophic Flood Landform**.

Code Number and Title (GIS FIELD)	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	Beach Ridge, Spit, Cusp, or Shore	SHORE	SH	
	Colluvial Slope	COLLUV	C	The morphologic transition between **Alluvial Fan** and **Colluvial Slope** can be gradational. In general, **Colluvial Slope** includes various forms of slopes dominated by sheetflood depositional processes as well as those dominated by slumps and other slope failures. Smaller fans not practical to differentiate at the 1:24,000 scale of mapping, whether alluvial or colluvial, are included in the **Colluvial Slope** value. Areas of **Colluvial Slope** often are present but are too narrow to be reasonably mapped at a scale of 1:24,000.
	Compaction Ridge	COMP_RIDG	CR	Ridges of coarser grained sand and gravel deposited by streams that flowed on a lake plain between glacial lake stages, therefore covered by a layer of lake clays. Defined in the Glacial Lake Agassiz **Geomorphic Region** by Bluemle (1967).
	Crevasse Splay	SPLAY	CS	This value includes crevasse channels, splay channels, and splay overbank belts.
	Delta	DELTA	DE	This value does not differentiate between different types of deltas. It includes deltas formed in lakes; fan deltas, where a river enters a riverine lake; and, deltas deposited where a river enters a larger river valley.
	Depression	DEPR	D	As used in the code, **Depression** is a general descriptive term for a relatively small topographic basin. It usually is used in conjunction with glacial **Landscape**s. The value may include **Linked Depression**s or **Interdunal Depression**s where they are not differentiated. Some **Depression**s may be old abandoned quarries which are indistinguishable as to their origin without a historic landuse record search.
	Depression, Kettle	DEPR_KETTLE	DK	Ice-block meltout depressions or parts parts of depressions not typically occupied by standing water.
	Disintegration Ridge	DIS_RIDGE	DS	Defined by the DNR for their (1:100k) geomorphology maps.
	Disturbed Areas	DISTURB	DI	This value primarily consists of quarries and pits, but can include vast construction sites and sewage treatment reservoirs. It does not include plowed fields.

Code Number and Title (GIS FIELD)	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	Doughnut	DOUGH	DO	
	Drainageway	DRAIN	DA	This value consists of low-order valleys that have a shallow "u" shape and ill-defined floodplain. They are typical of low-order upland valleys.
	Drumlin	DRUMLIN	DR	
	Dune	DUNE	ED	
	Erosional Residual	RESIDUAL	ER	A remnant of a once larger stratigraphic unit or body of rock that has been mostly eroded. This value is used in conjunction with **Catastrophic Flood** or, less frequently, **Outwash Landscape**s.
	Erosional Strath	STRATH	ST	A bench cut in bedrock or till by fluvial or glaciofluvial processes. It may or may not have a continuous or discontinuous veneer of younger fluvial deposits on it. This value is usually used in conjunction with **Catastrophic Flood** or **Outwash Landscape**s.
	Escarpment Complex	ESCARP_C	EC	This value is used in areas where the major landform is an escarpment with the **Glaciolacustrine** landscape and includes smaller **Terrace** and possibly **Beach Ridge** landforms which are not readily apparent at the 1:24,000 scale
	Esker	ESKER	EK	
	Floodplain, Undifferentiated	FLOOD	F	This value is mapped in lower order valleys where individual **Floodplain** types are not large enough, or distinct enough, to map at a scale of 1:24,000. Marshes and lakes on **Floodplain**s are considered subdivisions of **Floodplain**s and usually are not distinguished individually because many are seasonal and subject to large seasonal fluctuations in water depth and size. Individual sloughs on **Floodplain**s are not distinguished unless they are of considerable length and mapped as a **Paleochannel**. Otherwise, they are considered part of the lateral accretion **Floodplain** morphology.

Code Number and Title (GIS FIELD)	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	Floodplain, Type "w"	FL_W	FW	**Type "w" Floodplain**s have point bars or other channel migration features evident and recently active based on the lack, paucity, or type of vegetation. It often is associated with comparatively sparse or no vegetation; typically occurs between a marked discontinuity with other **Floodplain** types and the active river channel; and, lacking the aforementioned, may be an arbitrary distinction between **Type "w"** and **Type "x" Floodplain** types.
	Floodplain, Type "x"	FL_X	FX	**Type "x" Floodplain**s have point bars or other channel migration features evident, but they have not been recently active. They are usually vegetated.
	Floodplain, Type "y"	FL_Y	FY	Point bars or other channel migration features not evident on **Type "y" Floodplain**s, either due to burial by younger overbank deposits, or they were never present.
	Floodplain, Type "z"	FL_Z	FZ	**Type "z" Floodplain**s do not have evident point bars or other channel migration features; usually are surrounded or partially surrounded by **Valley Terrace** or **Catastrophic Flood Landscape**s; and/or are outside of, or otherwise isolated from, obvious former channel and/or overbank belts.
	Floodplain and Terraces, Undifferentiated	FLO&TERR	FN	This value is mapped in lower order valleys wide enough to have **Floodplain**s and **Terrace**s, but where individual **terrace** areas are not large enough, or distinct enough from **Floodplain** areas, to map at a scale of 1:24,000.
	Hillslope	HILL	H	This value refers only to relatively steep and high 1) valley walls along higher order valleys with floodplains; 2) ***upland*** hillslopes; and, 3) ***upland or valley*** slopes in bedrock terrains. It primarily consists of backslope hillslope components (*sensu* Ruhe, 1969). The upper limit usually is mapped where contour lines become more widely spaced, generally representing the position of the shoulder slope.
	Hummock	HUMMOCK	HU	As used in the code, **Hummock** is a general descriptive term for a relatively small topographic rise. It usually is used in conjunction with glacial **Landscape**s. The value may include Doughnuts and **Ice-Walled Lake Bed**s where they are not differentiated.

Code Number and Title (GIS FIELD)	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	Ice-Block Kame Terrace	ICEBK_KAME	IK	An often ring-shaped kame terrace formed in a glaciolacustrine or glaciofluvial setting at the perimeter of a stagnating glacial ice block (Hudak and Hajic 1999; Hudak and Hajic in preparation)
	Ice-Walled Lake Bed	ICE_WALLED	IW	This value is mapped in conjunction with the **Stagnant Ice Landscape**. It is used for circular Hummocks where associated stratified fine-textured deposits >2m thick are interpreted as lake sediments.
	Ice-Walled Lake Beach Ridge	ICE_WAL_BR	IB	This value is mapped in conjunction with the **Stagnant Ice Landscape**. It consists of narrow, arcuate, ridges that rise above surrounding **Stagnant Ice** LsSA terrain. It often is associated with, but not necessarily adjacent to, H**ummock**s mapped as **Ice-Walled Lake Beds**
	Inter-Drumlin Trough	INTER_D	ID	This value is for troughs between drumlins.
	Interdunal Depression or Pond	POND	DP	This value refers to a **Depression** that is interpreted to have been formed wholly or in part by eolian processes. It typically, but not necessarily, is at least partially surrounded by **Eolian Dune**s. Such a depression may seasonally or perennially contain a relatively small water body.
	Island	ISLAND	I	If other **Landform** assignments are deemed more significant than the **Island**-lake or **Island**-river relationship, **Island** is not used. Islands may have complicated stratigraphy, but were not field tested during the Mn/Model project.
	Isthmus	ISTHMUS	IT	
	Kame	KAME	K	
	Kame Terrace	KAMET	KT	Stratified drift deposited in depressions and cavities in stagnant ice and left as irregular steep-sided hills when the ice melts.
	Lake	LAKE	LN	
	Lake, Kettle	LAKE_KETTLE	LK	Lakes occupying all or parts of kettle depressions.
	Lake Bed, Exposed	LAKEBED	LB	Exposure may be naturally or artificially caused. This value is generally used for lake basins of intermediate size, not relatively small **Depression**s or **Linked Depression**s that may have at one time supported small lakes or ponds, or relatively large lake **Plain**s.

Code Number and Title (GIS FIELD)	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	Linked Depression(s)	DEPR_LINK	LD	Kemmis (1991). This value is related to glacial karst development. Many areas mapped as **Depression**s may fall within this value genetically, but either the linkage between individual **Depression**s was unclear, or **Depression**s were too small to map at the scale of 1:24,000.
	Marginal Channel	MARG_CHAN	MC	This value is usually used in conjunction with **Catastrophic Flood** LsSA.
	Meander Belt	MEANDER	MB	This value is mapped in conjunction with lower or intermediate order streams in their valleys, and where they cross **Floodplain**s or **Terrace**s in valleys of higher order streams.
	Natural Levee	LEVEE	NL	**Natural Levee**s form a continuum with lower, broader, more subtle rises of overbank deposits that are mapped as part of **Floodplain Types "y"** and **"z"** in some valleys.
	Outwash Fan, Apron	OUT_FAN	OF	
	Overbank Belt	OVERBANK	OB	**Overbank Belt** is used in conjunction with floodplains of relatively lower order streams where they cross **Floodplain**s or **Terrace**s in valleys of higher order streams.
	Ovoid-Shaped Bog (Ovoid Island)	OVOID_BOG	OV	See Heinselman (1963, 1970), Glaser et al. (1981), Wright and Glaser (1983), Minnesota Dept. of Natural Resources (1984), and Eng (1980).
	Paleochannel	PALEO_C	PC	This value includes distributary paleochannels on abandoned delta lobes.
	Pediment Slope	PEDIMENT	PD	This value may look similar to **Alluvial Fans** or **Colluvial Slopes** on topographic maps.
	Peninsula	PENIN	PE	
	Plain	PLAIN	P	This value usually is used in conjunction with, but is not limited to, **Outwash**, **Glaciolacustrine**, and glacial ice **Landscape**s. **Exposed Lake Bed** is used for exposed lake or glacial lake basins of intermediate or smaller size.
	Raised (Radial) Bog	RAD_BOG	RB	See Heinselman (1963; 1970), Glaser et al. (1981), Wright and Glaser (1983), Minnesota Dept. of Natural Resources (1984), and Eng (1980).
	Rapids, Nickpoint, Cascade, or Falls	RAPIDS	RP	
	Ribbed Fen	RIB_FEN	RF	See Heinselman (1963, 1970), Glaser et al. (1981), Wright and Glaser (1983), and Eng (1980).

Code Number and Title (GIS FIELD)	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	River Channel, Active	RIVER	R	
	Riverine Lake	RIV_LAKE	RL	
	Rock Basin	ROCK_BAS	RS	This value is used in **Bedrock Terrain**s.
	Rock Drumlins (Whale-backs)	ROCK_DRU	RD	This value is used in **Bedrock Terrain**s.
	Rogen Moraine	ROG_MOR	RM	
	Rouche Moutonnee	ROUCHE	RH	This value is used in **Bedrock Terrain**s.
	Sand Sheet	SHEET	ES	
	Standing Water, Reservoir	RESERVOIR	LR	
	Summit	SUMMIT	S	See Ruhe (1969). In the code, this value is applied to **Bedrock Terrain**s and erosional terrains only and primarily consists of summit slopes.
	Terrace	TERRACE	T	
	Terrace, High, Undifferentiated	H_TERRACE	HT	This value is mapped where multiple high terraces, or high and low terraces, are present, but reasonably can not be differentiated at the 1:24,000 scale of mapping.
	Tunnel Valley	TUN_VAL	TV	Valley carved by a stream flowing at the ice/land surface contact.
	"v"-Shaped Valley	V_VALLEY	V	This value consists of low-order valleys that have a "v" shape; little or no floodplain area; and, generally steep valley walls. Such valleys are often incised into the surrounding landscape**,** and may consist of the channel itself.
	Wave-Cut Platform	WAVE_CUT	WC	
CODE NO. 8 LANDFORM GEOGRAPHIC OR INFORMAL IDENTIFIER (LNDFRM_ID8)				This code consists of geographic or commonly used name for a **Landform**. It is to be added as needed.
	No Distinction Made	NO_DIST	*	
CODE NO. 9 LANDFORM SUBDIVISION (LDFRM_SUB9)				This code is provided for future use.
	No Distinction made	NO_DIST	*	

Code Number and Title (GIS FIELD)	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
CODE NO. 10 STREAM VALLEY ORDER (VLLY_ORD10)				Streams are ordered using the Strahler method (Strahler, 1964)
	Not Relevant or No Distinction Made	NO_DIST	*	
	1	1	1	
	2	2	2	
	3	3	3	
	Etc.	Etc.	Etc.	

CODE NO. 11
SURFACE CHARACTERISTICS AND MODIFICATIONS (SURFACE11)

*This code consists surface characteristics and modifications within a **Landform** or **Landscape** that are penecontemporaneous with, or post-date the development of the **Landform** or **Landscape**.*

Not Present or No Distinction Made	NO_DIST	*	
Boulder or Cobble Lag	BOULDER	R	
Braided Channel Pattern	BRAID	B	
Braided Channel Pattern with Shallow, Natural Standing Water	BRAID_MARSH	BM	
Island Braided Pattern	ISLAND_BR	IB	
Dendritic Channel Pattern	DENDR	DD	
Meandering Channel Pattern	MEANDER	S	
Flood Scour Channel Pattern	FL_SCOUR	F	
Distributary Pattern	DISTRIB	D	
Pitted	PITTED	P	
Wave or Current Modified, Subaerial	WAVE_AERIAL	WA	
Wave or Current Modified, Submerged	WAVE_SUBMERGE	WS	This code usually refers to submerged **Islands**, **Wave-Cut Platforms,** and **Ice-Block Kame Terraces.**
Water Modified	WATER_MOD	T	
Water Modified, Marsh	WAT_MOD_MAR	TM	
Wind Modified	WIND_MOD	N	
Linear, Reticulated, or Orbicular Patterns	RIP_ICE	I	Pertains to patterns recognized on the Glacial Lake Agassiz plain. See Mollard (1983).
Standing Water, Natural, Shallow	MARSH	MA	This value is used for areas with intermittent or permanent shallow water usually marked with a marsh symbol on USGS topographic maps. Larger areas are often mapped as **Peatland**s. This value is differentiated from **Standing Water, Natural** (lakes) by having relatively shallow water and subaerial vegetation.

CODE NO. 12 COLLAPSED LANDSCAPE OR LANDFORM (COLLAPSD12)				This code refers to a **Landform** or **Landscape** that had a core of glacial ice that subsequently melted and "let down" the overlying material.
	No Distinction Made	NO_DIST	*	
	Not Collapsed	NO_COLL	N	
	Collapsed	COLLAPSE	C	
CODE NO. 13 ERODED LANDSCAPE OR LANDFORM (ERODED13)				This code refers primarily to soil erosion that post-dates landform or landscape development.
	Not Present or No Distinction Made	NO_DIST	*	
	Eroded	ERODED	E	This value is used for areas of mappable size at a scale of 1:24,000 that show field, air photo, or soil mapping evidence of being eroded. The value may include relatively steep **Hillslopes.**
	Erosion Complex	EROSION_C	EC	This value is used for areas characterized by either intricately interfingered, or very small discontinuous areas, of eroded and non-eroded areas that individually are of unmappable size at a scale of 1:24,000, based on field, air photo, or soil mapping evidence.
	Iowan Erosion Surface	IOWAN	O	See Hallberg et al. (1978). Soil erosion that formed the Iowan Erosion Surface formed a **Landscape** of one or more erosional "steps" on interfluves in specific parts of the state.

MATERIAL AND MATERIAL SEQUENCE FIELD CODES

Code Number and Title	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
CODE NO. 14 POST-GLACIAL LITHOSTRATIGRAPHIC UNIT (PSTGLACU14)				This code is to be used when sufficient information is available to informally or formally name post-glacial fluvial, lacustrine, peatland, and eolian formations.
	No Distinction Made	NO_DIST	*	
CODE NO. 15 TEXTURE AND TEXTURE SEQUENCE OF NEAR-SURFACE MATERIAL (TEXTURE15)				This code only applies to the upper 2 m of material, including any **Overlying Deposits.** Two systems are represented, a general one that differentiates by fine, coarse and peat/organic muck textures, and a more specific one that differentiates by USDA NRCS soil textures. Only one of these systems can be used for each **Landform** or **Landscape**, depending on the amount and reliability of subsurface information available.
General	Variable at this Scale, or No Distinction Made	NO_DIST	*	
	Peat or Organic Muck	P	P	
	Fine	F	F	This value includes silt and finer material. It may include loam and clay loam, depending on the region being mapped.
	Thinly Bedded Fines	Y	Y	
	Fine over Peat	F/P	FP	
	Coarse	CO	CO	This value includes sandy loam and coarser material. It may include loam and clay loam, depending on the region being mapped.
	Peat or Organic Muck over Fine	P/F	PF	
	Peat or Organic Muck over Coarse	P/CO	PC	
	Peat or Organic Muck over Interstratified Coarse and Fine	P/INTR_C&F	PQ	

Code Number and Title	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	Interstratified Peat or Organic Muck and Fines	INTR_P&F	IPF	
	Discontinuous Peat or Organic Muck over Fine	DIS_P/F	PFN	
	Discontinuous Peat or Organic Muck over Coarse	DIS_P/CO	PCR	
	Fine over Coarse	F/CO	FC	
	Fine over Interstratified Coarse and Fine	F/INTR_C&F	FQ	
	Coarse over Fine	CO/F	CF	
USDA NRCS	Clay	CY	CY	
	Silty Clay	SICY	SIC	
	Silty Clay Loam	SICYL	SICL	
	Silt Loam	SIL	SIL	
	Silt	SI	SI	
	Loam	L	L	
	Clay Loam	CYL	CL	
	Sandy Clay Loam	SACYL	SCL	
	Sandy Loam	SAL	SL	
	Loamy Sand	LSA	LS	
	Sand	SA	S	
	Gravel	G	G	
	Cobble	COB	B	
	Peat or Organic Muck over Clay to Silt Loam	P/CY-SIL	P/C-SIL	
	Peat or Organic Muck over Silty Clay	P/SICY	P/SIC	
	Peat or Organic Muck over Silty Clay and Sandy Gravel	P/SICY&SAG	P/SICG	
	Peat or Organic Muck over Silty Clay Loam over Clay Loam	P/SICYL/CYL	P/SICL/CL	
	Peat or Organic Muck to Silty Clay Loam over Sandy Loam to Sand	P-SICYL/SAL-SA	P-SICL/SL-S	
	Peat or Organic Muck over Clay Loam to Sandy Loam	P/CYL-SAL	P/CL-SL	
	Peat or Organic Muck over Clay	P/CYL-LSA	P/CL-LS	

Code Number and Title	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	Loam to Loamy Sand			
	Peat or Organic Muck over Silty Clay Loam to Sandy Loam over Sand and Gravel	P/SICYL-SAL/SA&G	P/SICL-SL/S&G	
	Peat or Organic Muck over Silt Loam over Loam	P/SIL/L	P/SIL/L	
	Peat or Organic Muck over Silt Loam to Sand	P/SIL-SA	P/SIL-S	
	Peat or Organic Muck over Silt Loam over Loam to Sandy Loam	P/SIL/L-SAL	P/SIL/L-SL	
	Peat or Organic Muck over Silt Loam over Sandy Loam to Sand	P/SIL/SAL-SA	P/SIL/SL-S	
	Peat or Organic Muck over Silt over Sandy Loam	P/SI/SAL	P/SI/SL	
	Peat or Organic Muck to Silt over Sandy Loam to Sand	P-SI/SAL-SA	P-SI/SL-S	
	Peat or Organic Muck to Silt over Sandy Loam to Sand and Gravel	P-SI/SAL-SA&G	P-SI/SL-S&G	
	Peat or Organic Muck to Silt over Loamy Sand	P-SI/LSA	P-SI/LS	
	Peat or Organic Muck to Silt over Loamy Sand to Sand and Gravel	P-SI/LSA-SA&G	P-SI/LS-S&G	
	Peat or Organic Muck to Silt over Sand and Gravel	P-SI/SA&G	P-SI/S&G	
	Peat or Organic Muck over Loam	P/L	P/L	
	Peat or Organic Muck over Loam to Loamy Sand	P/L-LSA	P/L-LS	
	Peat or Organic Muck over Loam to Sand	P/L-SA	P/L-S	
	Peat or Organic Muck over Sandy Loam	P/SAL	P/SL	
	Peat or Organic Muck over	P/SAL-CYL	P/SL-CL	

Code Number and Title	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	Sandy Loam to Clay Loam			
	Peat or Organic Muck over Sandy Loam to Sand	P/SAL-SA	P/SL-S	
	Peat or Organic Muck over Loamy Sand over Loam	P/LSA/L	P/LS/L	
	Peat or Organic Muck over Loamy Sand	P/LSA	P/LS	
	Peat or Organic Muck over Loamy Sand over Sand and Gravel	P/LSA/SA&G	P/LS/S&G	
	Peat or Organic Muck over Loamy Sand to Sand	P/LSA-SA	P/LS-S	
	Peat or Organic Muck over Loamy Sand to Sand and Gravel	P/LSA-SA&G	P/LS-S&G	
	Peat or Organic Muck over Sand to Sandy Loam	P/SA-SAL	P/S-SL	
	Peat or Organic Muck over Sand over Loam to Clay Loam	P/SA/L-CYL	P/S/L-CL	
	Peat or Organic Muck over Sand	P/SA	P/S	
	Peat or Organic Muck over Sandy Gravel	P/SAG	P/SG	
	Interstratified Peat or Organic Muck and Sand	INTR_P&SA	IPS	
	Clay over Loam to Clay Loam	CY/L-CYL	C/L-CL	
	Clay to Sandy Loam over Loam to Clay Loam	CY-SAL/L-CYL	C-SL/L-CL	
	Clay Loam to Sandy Loam	CYL-SAL	CL-SL	
	Clay Loam to Sandy Loam over Sand	CYL-SAL/SA	CL-SL/S	
	Clay Loam to Loamy Sand	CYL-LSA	CL-LS	
	Silty Clay to Coarse	SICY-CO	SIC-C	
	Silty Clay and Sandy Gravel	SICY&SAG	SIC&SG	
	Silty Clay Loam and Sand	SICYL&SA	SICL&S	
	Silty Clay Loam over Clay Loam	SICYL/CYL	SICL/CL	
	Silty Clay Loam over Clay Loam	SICYL/CYL-L	SICL/CL-	

Code Number and Title	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	to Loam		L	
	Silty Clay Loam to Sandy Loam	SICYL-SAL	SICL-SL	
	Silty Clay Loam to Sandy Loam over Peat or Organic Muck over Sand and Gravel	SICYL-SAL/P/SA&G	SICL-SL/P/S&G	
	Silty Clay Loam to Sandy Loam over Sand	SICYL-SAL/SA	SICL-SL/S	
	Silty Clay Loam to Sandy Loam over Sand and Gravel	SICYL-SAL/SA&G	SICL-SL/S&G	
	Silty Clay Loam to Loamy Sand	SICYL-LSA	SICL-LS	
	Silty Clay Loam and Sandy Loam over Sand	SICYL-SAL/SA	SICL-SL/S	
	Silty Clay Loam to Sand	SICYL-SA	SICL-S	
	Silt Loam to Silty Clay Loam	SIL-SICYL	SIL-SICL	
	Silt Loam to Silty Clay Loam over Clay Loam	SIL-SICYL/CYL	SIL-SICL/CL	
	Silt Loam to Loam	SIL-L	SIL-L	
	Silt Loam over Loam	SIL/L	SIL/L	
	Silt Loam over Loam to Sandy Loam	SIL/L-SAL	SIL/L-SL	
	Silt Loam over Loam to Loamy Sand over Sand	SIL/L-LSA/SA	SIL/L-LS/S	
	Silt Loam over Sandy Loam	SIL/SAL	SIL/SL	
	Silt Loam over Sandy Loam over Sandy Gravel	SIL/SAL/SAG	SIL/SL/SG	
	Silt Loam over Sandy Loam to Sand	SIL/SAL-S	SIL/SL-S	
	Silt Loam over Sand	SIL/SA	SIL/S	
	Loam to Clay Loam	L-CYL	L-CL	
	Loam to Silt Loam over Sand	L-SIL/SA	L-SIL/S	
	Loam to Sandy Loam	L-SAL	L-SL	
	Loam to Sandy Loam over Sand and Gravel	L-SAL/SA&G	L-SL/S&G	
	Loam to Loamy Sand	L-LSA	L-LS	
	Loam to Loamy Sand over Sand	L-LSA/SA	L-LS/S	
	Loam to Sand	L-SA	L-S	
	Loam to Sand and Gravel	L-SA&G	L-S&G	

Code Number and Title	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	Loam over Clay Loam to Loam	L/CYL-L	L/CL-L	
	Loam over Sand	L/SA	L/S	
	Sandy Loam over Sand and Gravel	SAL/SA&G	SL/S&G	
	Sandy Loam over Gravelly Sand	SAL/GS	SL/GS	
	Sandy Loam over Sandy Clay Loam	SAL/SACYL	SL/SCL	
	Sandy Loam to Clay Loam	SAL-CYL	SL-CL	
	Sandy Loam over Sand	SAL/SA	SL/S	
	Sandy Loam over Sand and Gravel	SAL/S&G	SL/S&G	
	Sandy Loam over Gravelly Sand	SAL/GSA	SL/GS	
	Sandy Loam over Gravel	SAL/G	SL/G	
	Sandy Loam to Loamy Sand over Gravelly Sand	SAL-LSA/GSA	SL-LS/GS	
	Sandy Loam to Sand	SAL-SA	SL-S	
	Sandy Loam to Sand and Gravel	SAL-SA&G	SL-S&G	
	Sandy Loam to Sand and Gravel over Sandy Loam to Loamy Sand	SAL-SA&G/SAL-LSA	SL-S&G/SL-LS	
	Loamy Sand over Loam	LSA/L	LS/L	
	Loamy Sand over Sand and Gravel	LSA/SA&G	LS/S&G	
	Loamy Sand over Gravelly Sand	LSA/GSA	LS/GS	
	Loamy Sand to Sand	LSA-SA	LS-S	
	Loamy Sand to Sand and Gravel	LSA-SA&G	LS-S&G	
	Sand to Sandy Loam	SA-SAL	S-SL	
	Sand to Sandy Loam over Clay Loam	SA-SAL/CYL	S-SL/CL	
	Sand to Sandy Loam over Loam to Clay Loam	SA-SAL/L-CYL	S-SL/L-CL	
	Sand over Sandy Clay Loam	SA/SACYL	S/SCL	
	Sand and Gravel	SA&G	S&G	
	Sandy Gravel	SAG	SG	
	Gravelly Sand	GSA	GSA	
	Etc.	Etc.	Etc.	Texture sequences can be added as necessary, separating the two texture map symbols by a backslash.

Code Number and Title	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
CODE NO. 16 DIAMICTON TEXTURE (DIAMICTN16)				Unsorted sediment ranging from clay to boulders deposited in very active environments. This code applies to uppermost lithologic value(s).
	No Distinction Made	NO_DIST	*	
	Diamicton Texture Not Present or Uncommon	NO_DIA	O	
	Diamicton Texture	DIA	D	
CODE NO. 17 THICKNESS OF NEAR-SURFACE MATERIAL OVER BEDROCK OR GLACIAL DRIFT (THICKNSS17)				Use this code includes any thickness of material of **Overlying Deposits** in Code No. 18 in addition to the remaining underlying unconsolidated mostly non-glacial Quaternary materials. Thicknesses for some **Valley Margin** LsSA values consider the thickest part of these wedge-shaped landforms.
	No Distinction Made	NO_DIST	*	
	Not Present or <1m Thick, Laterally Discontinuous	ZERO	><	
	>2m Thick, Laterally Continuous	>2M	>>	
	<2m Thick, Laterally Continuous	<2M	<<	
	<2m, >1m Thick, Laterally Continuous	<2>1M	<>	
	>1m Thick, Laterally Continuous	>1M	>	
	<1m Thick, Laterally Continuous	<1M	<	
CODE NO. 18 OVERLYING DEPOSITS (OVERLDEP18)				"Overlying" refers to material usually <2m thick that was deposited on a **Landform** or **Landscape** sometime after the principal landform- or landscape-sediment assemblage developed. This deposit is not genetically related to the landform. Values under this code are applicable to any **Landform** or **Landscape**.
	Not Present	NO_PRES	N	
	No Distinction Made	NO_DIST	*	
	Type "o" Overbank Deposits	OVERO	O	This value is used where relatively very light tonal contrasts on aerial photography of valley areas are interpreted as overbank deposits that are likely to include, or field

Code Number and Title	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
				evidence indicates, deposition of significant post-settlement alluvium. Here "significant" means a sufficient thickness to obscure prehistoric cultural deposits. In plowed areas this typically means >0.27 m thick. In unplowed areas, it may be thinner. If not otherwise noted, presence is implied with **Floodplain Type "w"**.
	Type "a" Overbank Deposits	OVERA	A	This value is used where relatively light tonal contrasts on aerial photography of valley areas are interpreted as overbank deposits. They may or may not include significant post-settlement alluvium.
	Sheetflood Deposits, Undifferentiated	SHEET	S	
	Hillslope Colluvium; Biomantle	HILL_COLLUV	H	This value is usually applied to upland landscapes. It includes the range of recognizable products from the combination of upland hillslope erosional, depositional, and soil evolution processes. See Johnson (1990).
	Loess	LOESS	L	
	Glaciolacustrine	GLA_LK	GL	Thick (>2m) **Glaciolacustrine** sediment mantles may occur in some **Outwash** or other depressional settings, and could have been interpreted as a **Glaciolacustrine Plain**, except for the dominant geologic process that shaped the landform.
	Outwash	OUTWASH	OU	Thick (>2m) **Outwash** mantles may occur in some **Glaciolacustrine** or other depressional settings, and could have been interpreted as an **Outwash Plain**, except for the dominant geologic process that shaped the landform.
	Eolian Sand Sheet, Discontinuous	EOL_SAND	E;	Discontinuous dunes and/or sheet sand.
	Wetland	WET_LAC	W	This value is for organic wetland deposits, with or without interbedded lacustrine or glaciolacustrine deposits, and is usually associated with **Depression**s.
	Till	TILL	T	Till, undifferentiated
CODE NO. 19 BURIED SOILS				Documented or interpreted **Buried Soil**(s) are present, including consideration of **Overlying Deposits**. As used here, **Buried Soil** definition may include thick cumulic

Code Number and Title	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
(BURSOIL19)				soils. The definition of **Buried Soil** does not have the depth limitations imposed by the USDA NRCS definition of **Buried Soil**.
	No Distinction Made	NO_DIST	*	
	Buried Soil(s) Not Present or Uncommon	NO_BUR_SOL	O	
	Buried Soil(s) Commonly Present	BUR_SOL	B	
CODE NO. 20 BASEMENT MATERIAL (BASEMENT20)				
	Not Exposed Within 2m of Ground Surface, or No Distinction Made	NO_DIST	*	
	Bedrock, Undifferentiated	BEDROCK	B	
	Thin Glacial Drift over Bedrock	DRIFT_BED	GB	
	Bedrock or Glacial Drift, Undifferentiated	BEDR_GLAC	K	
	Bedrock, Igneous	IGNEOUS	IG	
	Bedrock, Metamorphic	METAM	M	
	Bedrock, Sedimentary	SEDIM	S	
	Bedrock, Carbonate	CARBONATE	SC	
	Glacial Drift, Undifferentiated	GLACIAL	G	
	Glaciolacustrine Deposits	GLA_LAKE	L	
	Glaciofluvial Deposits	OUTWASH	O	
	Till	TILL	T	
	Thin Glaciofluvial over Glacial Drift or Bedrock	OUT_DRIFT	OK	
CODE NO. 21 BASEMENT MATERIAL IDENTIFIER (BSMNT_ID21)				This code consists of the lithology or lithostratigraphic name of the material underlying the material of interest. It is to be developed as needed.
	No Distinction Made	NO_DIST	*	

Code Number and Title	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	Sherack Formation	SHERACK	S	
	Sherack and Poplar River Formations	SHERACK_POPLAR	SP	
	Cromwell Formation	CROM	CR	
	Duluth Complex	DULUTH	DC	
	Ely Greenstone	ELY_GRE	EG	
	Banded Iron Fm.	IRON	FE	
	Giants Range Granite	GIANTS	GI	
	North Shore Volcanic Group	NS_VOLCAN	NS	
	Rove Fm.	ROVE	RO	
	Saganaga Granite	SAGANAGA	SG	
	Trommald Fm.	TROMMALD	TR	
	Vermillion Granite	VERMILLION	VG	

TEMPORAL FIELD CODES

Code Number and Title	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
CODE NO. 22 STAGE OR SUBSTAGE OF LANDFORM-SEDIMENT ASSEMBLAGE (STG_LFSA22)				This code consists of the primary stage or substage of a **Landform**. It ignores minor younger surface modifications. See text regarding stage definitions. Additional temporal sequences can be added as necessary, separating the two stage or substage symbols by a hyphen.
	No Distinction Made	NO_DIST	*	
	Pre-Wisconsinan	PRE_WISC	P	
	Wisconsinan, Undifferentiated	WISC	W	
	Late Wisconsinan	L_WISC	LW	
	Late Wisconsinan to Holocene	L_WISC-HOL	LW-H	
	Late Wisconsinan to Early Holocene	L_WISC-E_HOL	LW-E	
	Late Wisconsinan to Late Holocene	L_WISC-L_HOL	LW-L	
	Late Wisconsinan to Historic	L_WISC-HIST	LW-S	

Code Number and Title	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	Holocene, Undifferentiated	HOL_UNDIFF	U	This code may or may not include all the substages of the Holocene.
	Holocene	HOL	H	This code includes the Historic substage.
	Holocene to Historic	HOL-HIST	H-S	
	Early Holocene	E_HOL	E	
	Early to Middle Holocene	E_HOL-M_HOL	E-M	
	Early to Late Holocene	E_HOL-L_HOL	E-L	
	Early Holocene to Historic	E-HOL-HIST	E-S	
	Middle Holocene	M_HOL	M	
	Middle to Late Holocene	M_HOL-L_HOL	M-L	
	Middle Holocene to Historic	M_HOL-HIST	M-S	
	Late Holocene	L_HOL	L	
	Late Holocene to Historic	L_HOL-HIST	L-S	
	Historic	HIST	S	
CODE NO. 23 STAGE OF OVERLYING DEPOSITS (STGOVRDP23)				This code consists of the stage of deposition of **Overlying Deposits** of Code No. 18. See text regarding stage definitions. Additional temporal sequences can be added as necessary, separating the two stage or substage symbols by a hyphen.
	Not Relevant or No Distinction Made	NO_DIST	*	
	Pre-Wisconsinan	PRE_WISC	P	
	Wisconsinan, Undifferentiated	WISC	W	
	Late Wisconsinan	L_WISC	LW	
	Late Wisconsinan to Holocene	L_WISC-HOL	LW-H	
	Late Wisconsinan to Early Holocene	L_WISC-E_HOL	LW-E	
	Late Wisconsinan to Historic	L_WISC-HIST	LW-S	
	Holocene, Undifferentiated	HOL_UNDIFF	U	This code may or may not include all the substages of the Holocene.
	Holocene	HOL	H	This code includes the Historic substage.
	Early Holocene	E_HOL	E	
	Early to Middle Holocene	E_HOL-M_HOL	E-M	

Code Number and Title	Value	GIS Code Symbol	Map or Code-String Symbol	Comments
	Early to Late Holocene	E_HOL-L_HOL	E-L	
	Early Holocene to Historic	E-HOL-HIST	E-S	
	Middle Holocene	M_HOL	M	
	Middle to Late Holocene	M_HOL-L_HOL	M-L	
	Middle Holocene to Historic	M_HOL-HIST	M-S	
	Late Holocene	L_HOL	L	
	Late Holocene to Historic	L_HOL-HIST	L-S	
	Historic	HIST	S	

CODE NO. 24 GLACIAL LAKE OR GLACIAL ICE PHASE (GLACPHAS24)				This code consists of recognized glacial ice and lake phases for the stratigraphically highest basement material
	No Distinction Made	NO_DIST	*	
Glacial Lake Phase				
	Cass	CASS	CS	
	Emerson	EMER	EM	
	Lockhart	LOCK	LO	
	Moorhead	MOOR	MO	
	Nipigon	NIPI	NI	
Glacial Ice Phase				
	Automba	AUTO	AU	
	Culver	CULV	CU	
	Duluth	DULU	DU	
	Hewitt	HEWI	HE	
	Itasca	ITAS	IT	
	Nickerson	NICK	NI	
	Pine City	PINE	PI	
	Split Rock	SPLI	SP	
	St. Croix	STCR	ST	
	St. Croix - Automba	STCR_AUTO	ST-AU	Superior lobe tills possibly representing both the Automba and St. Croix phases and that are either indistinguishable from each other, or are found in an interspersed mosaic pattern that is too fine to distinguish at the current mapping scale.
CODE NO. 25 RELATIVE AGE OF GEOMORPHIC UNIT WITHIN A LANDFORM DEFINED BY CODE 7 (AGE_INLF25)				Most commonly refers to **Terraces** or **Wave-Cut Platforms**. A **Paleochannel**'s relative age refers to its associated **Terrace**'s relative age and not to the cross-cutting relations among these channels.
	No Distinction Made	NO_DIST	*	
	Youngest	YOUNG	1	
	Next to Youngest	YOUNG+1	2	
	Second Next to Youngest	YOUNG+2	3	

	Third Next to Youngest	YOUNG+3	4
	Fourth Next to Youngest	YOUNG+4	5
	Etc.	Etc.	Etc.

CODE NO. 26
RELATIVE AGE OF GEOMORPHIC UNIT WITHIN A LANDFORM SUBDIVISION AS DEFINED IN CODE 9
(AGE_INSB26)

No Distinction Made	NO_DIST	*
Youngest	YOUNG	1
Next to Youngest	YOUNG+1	2
Second Next to Youngest	YOUNG+2	3
Third Next to Youngest	YOUNG+3	4
Fourth Next to Youngest	YOUNG+4	5
Etc.	Etc.	Etc.

CODE NO. 27
RELATIVE AGE OF LANDFORM-SEDIMENT ASSEMBLAGE TO OTHER LANDSCAPE- OR LANDFORM-SEDIMENT ASSEMBLAGES
(RLAGELSA27)

No Distinction Made	NO_DIST	*
Overlying, Crosscutting or Interfingering with Active Ice LsSA	A_ACT_ICE	I
Overlying, Crosscutting or Interfingering with Stagnant Ice LsSA	A_STAG_ICE	S
Overlying, Crosscutting or Interfingering with Ice Contact LsSA	A_ICE_CONT	N
Overlying, Crosscutting or Interfingering with Pediment	A_PEDIMENT	P

LsSA		
Overlying, Crosscutting or Interfingering with Glaciofluvial LsSA	A_OUTWASH	O
Overlying, Crosscutting or Interfingering with Catastrophic Flood LsSA	A_CAT_FLOOD	C
Overlying, Crosscutting or Interfingering with Glaciolacustrine LsSA	A_GLAC_LAC	A
Overlying, Crosscutting or Interfingering with Paleo-Valley LsSA	A_PALEO_VAL	Y
Overlying, Crosscutting or Interfingering with Peatland LsSA	A_PEAT	B
Overlying, Crosscutting or Interfingering with Valley Terrace LsSA	A_VAL_TERR	V
Overlying, Crosscutting or Interfingering with Floodplain LsSA	A_FLOOD	F
Overlying, Crosscutting or Interfingering with Valley Margin LsSA	A_VAL_MARG	M
Overlying, Crosscutting or Interfingering with Eolian LsSA	A_EOLIAN	E
Overlying, Crosscutting or Interfingering with Lacustrine LsSA	A_LAKE	L
Overlying, Crosscutting or Interfingering with [LfSA as necessary]	Etc.	Etc.

CODE NO. 28 GEOCHRONOLOGY OF LfSA: LESS THAN OR EQUAL TO (GEOCHNLT28)			This code consists of a number interpreted from one or more radiocarbon ages, in uncorrected radiocarbon years before present, for a **Landform-Sediment Assemblage**. The code will continue to be developed and refined as more radiocarbon ages become available. The Map Code has dropped the "ten's" off the years to abbreviate for mapping.
	No Distinction Made	NO_DIST	*
	12,000 B.P.	12000	1200
CODE NO. 29 GEOCHRONOLOGY OF LfSA: GREATER THAN OR EQUAL TO (GEOCHNGT29)			This code consists of a number interpreted from one or more radiocarbon ages, in uncorrected radiocarbon years before present, for a **Landform-Sediment Assemblage**. The code will continue to be developed and refined as more radiocarbon ages become available. The Map Code has dropped the "ten's" off the years to abbreviate for mapping.
	No Distinction Made	NO_DIST	*
	Present	0	0
CODE NO. 30 GEOCHRONOLOGY OF OVERLYING DEPOSITS: LESS THAN OR EQUAL TO (O_CHRNLT30)			This code consists of a number interpreted from one or more radiocarbon ages, in uncorrected radiocarbon years before present, for **Overlying Deposits**. The code will continue to be developed and refined as more radiocarbon ages become available. The Map Code has dropped the "ten's" off the years to abbreviate for mapping.
	No Distinction Made	NO_DIST	*
	12,000	12000	1200
CODE NO. 31 GEOCHRONOLOGY OF OVERLYING DEPOSITS GREATER THAN OR EQUAL TO (O_CHRNGT31)			This code consists of a number interpreted from one or more radiocarbon ages, in uncorrected radiocarbon years before present, for **Overlying Deposits**. The code will continue to be developed and refined as more radiocarbon ages become available. The Map Code has dropped the "ten's" off the years to abbreviate for mapping.

	No Distinction Made	NO_DIST	*	
	Present	0	0	
CODE NO. 32 GEOCHRONOLOGY OF BASEMENT MATERIAL: LESS THAN OR EQUAL TO (BSMCHRLT32)				This code consists of a number interpreted from one or more radiocarbon ages, in uncorrected radiocarbon years before present, for **Basement Material**. The code will continue to be developed and refined as more radiocarbon ages become available. **Basement Material** may have the same **Geochronology** as the LfSA **Geochronology** if the B**asement Material** is part of the LfSA. The Map Code has dropped the "ten's" off the years to abbreviate for mapping.
	No Distinction Made	NO_DIST	*	
CODE NO. 33 GEOCHRONOLOGY OF BASEMENT MATERIAL: GREATER THAN OR EQUAL TO (BSMCHRGT33)				This code consists of a number interpreted from one or more radiocarbon ages, in uncorrected radiocarbon years before present, for **Basement Material**. The code will continue to be developed and refined as more radiocarbon ages become available. The **Basement Material** may have the same **Geochronology** as the LfSA **Geochronology** if the **Basement Material** is part of the LfSA. The Map Code has dropped the "ten's" off the years to abbreviate for mapping.
	No Distinction Made	NO_DIST	*	
	12,000	12000	1200	
Geologic Age of Surface (AGE_0M)				Whether the age of the LfSA surface falls within or without the recognized time span that Pre-Contact peoples lived in Minnesota (i.e., 12,500-200 B.P.).
	Outside the valid time span	0		
	Within the valid time span	1		
Geologic Age from Surface to 1 meter depth (AGE_0_1M)				Whether the age of the LfSA from the surface to one meter below the surface falls within or without the recognized time span that Pre-Contact peoples lived in Minnesota (i.e., 12,500-200 B.P.).
	Outside the valid time span	0		

	Within the valid time span	1	
Geologic Age from 1 meter to 2 meter depth (AGE_1_2M)			Whether the age of the LfSA from one meter below the surface to two meters below the surface falls within or without the recognized time span that Pre-Contact peoples lived in Minnesota (i.e., 12,500-200 B.P.).
	Outside the valid time span	0	
	Within the valid time span	1	
Geologic Age from 2 meter to 5 meter depth (AGE_2_5M)			Whether the age of the LfSA from two meters below the surface to five meters below the surface falls within or without the recognized time span that Pre-Contact peoples lived in Minnesota (i.e., 12,500-200 B.P.).
	Outside the valid time span	0	
	Within the valid time span	1	
Post-Depositional Environment at LfSA Surface (P_DEPO_0M)			Whether the land surface has been disturbed such that in situ prehistoric cultural deposits would or would not have been preserved. Does not consider plowed surfaces.
	Disturbed	0	
	Undisturbed	1	
Depositional Environment from 0 to 1 Meter Depth (DEPO_0_1M)			Estimate of the degree to which the energy conditions and other factors would have affected landscape suitability for occupation and preservation of prehistoric cultural deposits.
	Unsuitable	0	
	Low suitability	1	
	Moderate suitability	2	
	High suitability	3	
Depositional Environment from 1 to 2 Meter Depth (DEPO_1_2M)			Estimate of the degree to which the energy conditions and other factors would have affected landscape suitability for occupation and preservation of prehistoric cultural deposits.
	Unsuitable	0	
	Low suitability	1	
	Moderate suitability	2	
	High suitability	3	

Depositional Environment from 2 to 5 Meter Depth (DEPO_2_5M)			Estimate of the degree to which the energy conditions and other factors would have affected landscape suitability for occupation and preservation of prehistoric cultural deposits.
	Unsuitable	0	
	Low suitability	1	
	Moderate suitability	2	
	High suitability	3	
Landscape Suitability Rating at Surface (LSR_0M)			Suitability of the landscape surface to contain prehistoric cultural deposits. A product of surface geologic age (AGE_0M) and post-depositional environment (P_DEPO_0M)
	Unsuitable	0	
	Low suitability	1	
Landscape Suitability Rating at 0 to 1 Meter Depth (LSR_0_1M)			Suitability of the 0-1 meter depth to contain prehistoric cultural deposits. A product of surface geologic age (AGE_0_1M) and depositional environment (DEPO_0_1M)
	Unsuitable	0	
	Low suitability	1	
	Moderate suitability	2	
	High suitability	3	
Landscape Suitability Rating at 1 to 2 Meter Depth (LSR_1_2M)			Suitability of the 1-2 meter depth to contain prehistoric cultural deposits. A product of surface geologic age (AGE_1_2M) and depositional environment (DEPO_1_2M)
	Unsuitable	0	
	Low suitability	1	
	Moderate suitability	2	
	High suitability	3	
Landscape Suitability Rating at 2 to 5 Meter Depth (LSR_2_5M)			Suitability of the 2-5 meter depth to contain prehistoric cultural deposits. A product of surface geologic age (AGE_2_5M) and depositional environment (DEPO_2_5M)
	Unsuitable	0	
	Low suitability	1	
	Moderate suitability	2	
	High suitability	3	

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