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# Ponding or Flooding

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## Definitions

### Flooding Frequency Class

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent.

* **“None”** means that flooding is not probable. The chance of flooding is nearly 0 percent in any year. Flooding occurs less than once in 500 years.
* **“Very rare”** means that flooding is very unlikely but possible under extremely unusual weather conditions. The chance of flooding is less than 1 percent in any year.
* **“Rare”** means that flooding is unlikely but possible under unusual weather conditions. The chance of flooding is 1 to 5 percent in any year.
* **“Occasional”** means that flooding occurs infrequently under normal weather conditions. The chance of flooding is 5 to 50 percent in any year.
* **“Frequent”** means that flooding is likely to occur often under normal weather conditions. The chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year.
* **“Very frequent”** means that flooding is likely to occur very often under normal weather conditions. The chance of flooding is more than 50 percent in all months of any year.

Note: Very rare and rare are not used in CART.

### Ponding Frequency Class

Ponding is standing water in a closed depression. The water is removed only by deep percolation, transpiration, or evaporation or by a combination of these processes. Ponding frequency classes are based on the number of times that ponding occurs over a given period. Frequency is expressed as none, rare, occasional, and frequent.

* **“None”** means that ponding is not probable. The chance of ponding is nearly 0 percent in any year.
* **“Rare”** means that ponding is unlikely but possible under unusual weather conditions. The chance of ponding is nearly 0 percent to 5 percent in any year.
* **“Occasional”** means that ponding occurs, on the average, once or less in 2 years. The chance of ponding is 5 to 50 percent in any year.
* **“Frequent”** means that ponding occurs, on the average, more than once in 2 years. The chance of ponding is more than 50 percent in any year.

Note: Rare is not used in CART.

## Excess Water Resource Concern

### Description

Surface water restricts land use and management goals.

### Objective

Manage surface water more efficiently.

### Analysis within CART

Each PLU is assessed regardless of land use. The assessment triggers a soil-data web-service to determine flood frequency rating of occasional, frequent, or very frequent. It also triggers a web service to evaluate if the PLU is within a 100-year flood plain according to FEMA maps. Either condition triggers an assessment of the resource concern and sets the threshold to 50. The planner may also identify the presence or absence of this resource concern based on site specific conditions and set the threshold to 50.

## Script Breakdown

#### Insert identifier(s) string and WKT geometry for each area of interest (AOI) polygon

SELECT @aoiGeom = GEOMETRY::STGeomFromText('MULTIPOLYGON (((-102.12335160658608 45.959173206572416, -102.13402890980223 45.959218442561564, -102.13386921506947 45.944643788188387, -102.12327175652177 45.944703605814198, -102.12335160658608 45.959173206572416)))', 4326);

SELECT @aoiGeomFixed = @aoiGeom.MakeValid().STUnion(@aoiGeom.STStartPoint());

INSERT INTO #AoiTable ( landunit, aoigeom )

VALUES ('T9981 Fld3', @aoiGeomFixed);

SELECT @aoiGeom = GEOMETRY::STGeomFromText('MULTIPOLYGON (((-102.1130336443976 45.959162795100383, -102.12335160658608 45.959173206572416, -102.12327175652177 45.944703605814198, -102.1128892282776 45.944710506326032, -102.1130336443976 45.959162795100383)))', 4326);

SELECT @aoiGeomFixed = @aoiGeom.MakeValid().STUnion(@aoiGeom.STStartPoint());

INSERT INTO #AoiTable ( landunit, aoigeom )

VALUES ('T9981 Fld4', @aoiGeomFixed);

| **aoiid** | **landunit** | **aoigeom** |
| --- | --- | --- |
| 1 | T9981 Fld3 | POLYGON ((-102.13386921506947 45.944643788188387, -102.12327175652177 45.9447036058142, -102.12335160658608 45.959173206572416, -102.13402890980223 45.959218442561564, -102.13386921506947 45.944643788188387)) |
| 2 | T9981 Fld4 | POLYGON ((-102.12327175652177 45.9447036058142, -102.1128892282776 45.944710506326032, -102.1130336443976 45.959162795100383, -102.12335160658608 45.959173206572416, -102.12327175652177 45.9447036058142)) |

#### Create summary acres for each landunit

CREATE TABLE #AoiAcres

( aoiid INT,

landunit CHAR(20),

landunit\_acres FLOAT

);

INSERT INTO #AoiAcres (aoiid, landunit, landunit\_acres )\

SELECT aoiid, landunit,

SUM( ROUND( ( ( GEOGRAPHY::STGeomFromWKB(aoigeom.STAsBinary(), 4326 ).STArea() ) / 4046.8564224 ), 3 ) ) AS landunit\_acres

FROM #AoiTable

GROUP BY aoiid, landunit;

| **aoiid** | **landunit** | **landunit\_acres** |
| --- | --- | --- |
| 1 | T9981 Fld3 | 328.952 |
| 2 | T9981 Fld4 | 318.722 |

#### Populate intersected soil polygon table with geometry

-- Create intersected soil polygon table with geometry

CREATE TABLE #AoiSoils

( polyid INT IDENTITY (1,1),

aoiid INT,

landunit CHAR(20),

mukey INT,

soilgeom GEOMETRY

);

INSERT INTO #AoiSoils (aoiid, landunit, mukey, soilgeom)

SELECT A.aoiid, A.landunit, M.mukey, M.mupolygongeo.STIntersection(A.aoigeom ) AS soilgeom

FROM mupolygon M, #AoiTable A

WHERE mupolygongeo.STIntersects(A.aoigeom) = 1;

#### Populate soil geometry with landunit attribute

-- Soil geometry with landunits

CREATE TABLE #AoiSoils2

( aoiid INT,

polyid INT,

landunit CHAR(20),

mukey INT,

poly\_acres FLOAT,

soilgeog GEOGRAPHY

);

-- Populate Soil geometry with landunit attribute

INSERT INTO #AoiSoils2

SELECT aoiid, polyid, landunit, mukey, ROUND((( GEOGRAPHY::STGeomFromWKB(soilgeom.STAsBinary(), 4326 ).STArea() ) / 4046.8564224 ), 3 ) AS poly\_acres, GEOGRAPHY::STGeomFromWKB(soilgeom.STAsBinary(), 4326 ) AS soilgeog

FROM #AoiSoils;

#### Populate soil map unit acres, aggregated by mukey (merges polygons together)

INSERT INTO #M2

SELECT DISTINCT M1.aoiid, M1.landunit, M1.mukey,

ROUND (SUM (M1.poly\_acres) OVER(PARTITION BY M1.landunit, M1.mukey), 3) AS mapunit\_acres

FROM #AoiSoils2 AS M1

GROUP BY M1.aoiid, M1.landunit, M1.mukey, M1.poly\_acres;

#### Component level data and mapunit sum-of-comppct\_r (major components only)

CREATE TABLE #M4

( aoiid INT,

landunit CHAR(20),

mukey INT,

mapunit\_acres FLOAT,

cokey INT,

compname CHAR(60),

comppct\_r INT,

majcompflag CHAR(3),

mu\_pct\_sum INT,

major\_mu\_pct\_sum INT,

drainagecl CHAR(254)

);

---Populate component level data with cokey, comppct\_r and mapunit sum-of-comppct\_r

INSERT INTO #M4

SELECT M2.aoiid, M2.landunit, M2.mukey, mapunit\_acres, CO.cokey, CO.compname, CO.comppct\_r, CO.majcompflag, (SELECT SUM (CCO.comppct\_r)

FROM #M2 AS MM2

INNER JOIN component AS CCO ON CCO.mukey=MM2.mukey AND M2.mukey=MM2.mukey AND majcompflag = 'Yes' ) AS major\_mu\_pct\_sum,

SUM (CO.comppct\_r) OVER(PARTITION BY M2.landunit, M2.mukey) AS mu\_pct\_sum, drainagecl

FROM #M2 AS M2

INNER JOIN component AS CO ON CO.mukey = M2.mukey

| **aoiid** | **landunit** | **mukey** | **mapunit\_acres** | **cokey** | **compname** | **comppct\_r** | **majcompflag** | **mu\_pct\_sum** | **major\_mu\_pct\_sum** | **drainagecl** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | T9981 Fld3 | 354627 | 0.426 | 16464493 | Slickspots | 2 | No | 90 | 100 | Well drained |
| 1 | T9981 Fld3 | 354627 | 0.426 | 16464494 | Daglum | 25 | Yes | 90 | 100 | Well drained |
| 1 | T9981 Fld3 | 354627 | 0.426 | 16464495 | Farnuf | 65 | Yes | 90 | 100 | Well drained |
| 1 | T9981 Fld3 | 354627 | 0.426 | 16464496 | Grail | 3 | No | 90 | 100 | Moderately well drained |
| 1 | T9981 Fld3 | 354627 | 0.426 | 16464497 | Rhoades | 3 | No | 90 | 100 | Well drained |
| 1 | T9981 Fld3 | 354627 | 0.426 | 16464498 | Tally | 2 | No | 90 | 100 | Well drained |
| 1 | T9981 Fld3 | 354648 | 0.287 | 16464607 | Amor | 25 | Yes | 85 | 100 | Well drained |
| 1 | T9981 Fld3 | 354648 | 0.287 | 16464608 | Arnegard | 4 | No | 85 | 100 | Moderately well drained |
| 1 | T9981 Fld3 | 354648 | 0.287 | 16464609 | Belfield | 4 | No | 85 | 100 | Well drained |
| 1 | T9981 Fld3 | 354648 | 0.287 | 16464610 | Heil | 1 | No | 85 | 100 | Poorly drained |
| 1 | T9981 Fld3 | 354648 | 0.287 | 16464611 | Lantry | 3 | No | 85 | 100 | Well drained |
| 1 | T9981 Fld3 | 354648 | 0.287 | 16464612 | Reeder | 60 | Yes | 85 | 100 | Well drained |
| 1 | T9981 Fld3 | 354648 | 0.287 | 16464613 | Vebar | 3 | No | 85 | 100 | Well drained |
| 1 | T9981 Fld3 | 2494708 | 1.729 | 16663928 | Regent | 5 | No | 81 | 100 | Well drained |
| 1 | T9981 Fld3 | 2494708 | 1.729 | 16663929 | Chama | 5 | No | 81 | 100 | Well drained |
| 1 | T9981 Fld3 | 2494708 | 1.729 | 16663930 | Amor | 49 | Yes | 81 | 100 | Well drained |
| 1 | T9981 Fld3 | 2494708 | 1.729 | 16663931 | Cabba | 32 | Yes | 81 | 100 | Well drained |
| 1 | T9981 Fld3 | 2494708 | 1.729 | 16663932 | Shambo | 9 | No | 81 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525720 | 56.699 | 16663899 | Daglum | 33 | Yes | 176 | 100 | Moderately well drained |
| 1 | T9981 Fld3 | 2525720 | 56.699 | 16663900 | Savage | 3 | No | 176 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525720 | 56.699 | 16663901 | Barkof | 2 | No | 176 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525720 | 56.699 | 16663902 | Rhoades | 2 | No | 176 | 100 | Moderately well drained |
| 1 | T9981 Fld3 | 2525720 | 56.699 | 16663903 | Rhoades | 55 | Yes | 176 | 100 | Moderately well drained |
| 1 | T9981 Fld3 | 2525720 | 56.699 | 16663904 | Belfield | 5 | No | 176 | 100 | Moderately well drained |
| 1 | T9981 Fld3 | 2525732 | 1.35 | 16663795 | Lakota | 4 | No | 72 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525732 | 1.35 | 16663796 | Ekalaka | 55 | Yes | 72 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525732 | 1.35 | 16663797 | Yegen | 17 | Yes | 72 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525732 | 1.35 | 16663798 | Desart | 14 | No | 72 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525732 | 1.35 | 16663799 | Parshall | 6 | No | 72 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525732 | 1.35 | 16663800 | Rhoades | 2 | No | 72 | 100 | Moderately well drained |
| 1 | T9981 Fld3 | 2525732 | 1.35 | 16663801 | Vebar | 2 | No | 72 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525733 | 0.129 | 16663950 | Beisigl | 7 | No | 75 | 100 | Somewhat excessively drained |
| 1 | T9981 Fld3 | 2525733 | 0.129 | 16663951 | Vebar | 50 | Yes | 75 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525733 | 0.129 | 16663952 | Cohagen | 25 | Yes | 75 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525733 | 0.129 | 16663953 | Tally | 14 | No | 75 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525733 | 0.129 | 16663954 | Amor | 2 | No | 75 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525733 | 0.129 | 16663955 | Arnegard | 2 | No | 75 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525739 | 28.479 | 16663915 | Parshall | 20 | Yes | 78 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525739 | 28.479 | 16663916 | Tally | 12 | No | 78 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525739 | 28.479 | 16663917 | Vebar | 58 | Yes | 78 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525739 | 28.479 | 16663918 | Arnegard | 8 | No | 78 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525739 | 28.479 | 16663919 | Cohagen | 2 | No | 78 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525745 | 4.983 | 16663920 | Farnuf | 12 | No | 150 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525745 | 4.983 | 16663921 | Shambo | 75 | Yes | 150 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525745 | 4.983 | 16663922 | Arnegard | 10 | No | 150 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525745 | 4.983 | 16663923 | Amor | 3 | No | 150 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525746 | 16.106 | 16663924 | Arnegard | 10 | No | 156 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525746 | 16.106 | 16663925 | Farnuf | 8 | No | 156 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525746 | 16.106 | 16663926 | Amor | 4 | No | 156 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525746 | 16.106 | 16663927 | Shambo | 78 | Yes | 156 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525754 | 12.638 | 16663598 | Heil | 3 | No | 150 | 100 | Poorly drained |
| 1 | T9981 Fld3 | 2525754 | 12.638 | 16663599 | Rhoades | 4 | No | 150 | 100 | Moderately well drained |
| 1 | T9981 Fld3 | 2525754 | 12.638 | 16663600 | Daglum | 2 | No | 150 | 100 | Moderately well drained |
| 1 | T9981 Fld3 | 2525754 | 12.638 | 16663601 | Vanda | 5 | No | 150 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525754 | 12.638 | 16663602 | Harriet | 75 | Yes | 150 | 100 | Poorly drained |
| 1 | T9981 Fld3 | 2525754 | 12.638 | 16663603 | Regan | 6 | No | 150 | 100 | Poorly drained |
| 1 | T9981 Fld3 | 2525754 | 12.638 | 16663604 | Glenross | 5 | No | 150 | 100 | Poorly drained |
| 1 | T9981 Fld3 | 2525764 | 17.691 | 16663605 | Peta | 2 | No | 55 | 100 | Somewhat poorly drained |
| 1 | T9981 Fld3 | 2525764 | 17.691 | 16663606 | Dimmick | 6 | No | 55 | 100 | Very poorly drained |
| 1 | T9981 Fld3 | 2525764 | 17.691 | 16663607 | Arveson | 12 | No | 55 | 100 | Poorly drained |
| 1 | T9981 Fld3 | 2525764 | 17.691 | 16663608 | Regan | 10 | No | 55 | 100 | Poorly drained |
| 1 | T9981 Fld3 | 2525764 | 17.691 | 16663609 | Harriet | 7 | No | 55 | 100 | Poorly drained |
| 1 | T9981 Fld3 | 2525764 | 17.691 | 16663610 | Straw | 3 | No | 55 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525764 | 17.691 | 16663611 | Regan | 55 | Yes | 55 | 100 | Poorly drained |
| 1 | T9981 Fld3 | 2525764 | 17.691 | 16663612 | Marysland | 5 | No | 55 | 100 | Poorly drained |
| 1 | T9981 Fld3 | 2525766 | 0.032 | 16663539 | Water | 100 | Yes | 100 | 100 | NULL |
| 1 | T9981 Fld3 | 2525769 | 181.356 | 16663985 | Belfield | 48 | Yes | 176 | 100 | Moderately well drained |
| 1 | T9981 Fld3 | 2525769 | 181.356 | 16663986 | Grail | 5 | No | 176 | 100 | Moderately well drained |
| 1 | T9981 Fld3 | 2525769 | 181.356 | 16663987 | Daglum | 40 | Yes | 176 | 100 | Moderately well drained |
| 1 | T9981 Fld3 | 2525769 | 181.356 | 16663988 | Savage | 5 | No | 176 | 100 | Well drained |
| 1 | T9981 Fld3 | 2525769 | 181.356 | 16663989 | Rhoades | 2 | No | 176 | 100 | Moderately well drained |
| 1 | T9981 Fld3 | 2755648 | 2.449 | 16663766 | Reeder | 58 | Yes | 156 | 100 | Well drained |
| 1 | T9981 Fld3 | 2755648 | 2.449 | 16663767 | Janesburg | 20 | Yes | 156 | 100 | Well drained |
| 1 | T9981 Fld3 | 2755648 | 2.449 | 16663768 | Amor | 10 | No | 156 | 100 | Well drained |
| 1 | T9981 Fld3 | 2755648 | 2.449 | 16663769 | Dogtooth | 5 | No | 156 | 100 | Well drained |
| 1 | T9981 Fld3 | 2755648 | 2.449 | 16663770 | Regent | 3 | No | 156 | 100 | Well drained |
| 1 | T9981 Fld3 | 2755648 | 2.449 | 16663771 | Belfield | 2 | No | 156 | 100 | Moderately well drained |
| 1 | T9981 Fld3 | 2755648 | 2.449 | 16663772 | Barkof | 2 | No | 156 | 100 | Well drained |
| 1 | T9981 Fld3 | 2755654 | 4.599 | 16663846 | Reeder | 60 | Yes | 85 | 100 | Well drained |
| 1 | T9981 Fld3 | 2755654 | 4.599 | 16663847 | Amor | 25 | Yes | 85 | 100 | Well drained |
| 1 | T9981 Fld3 | 2755654 | 4.599 | 16663848 | Belfield | 4 | No | 85 | 100 | Moderately well drained |
| 1 | T9981 Fld3 | 2755654 | 4.599 | 16663849 | Regent | 3 | No | 85 | 100 | Well drained |
| 1 | T9981 Fld3 | 2755654 | 4.599 | 16663850 | Vebar | 3 | No | 85 | 100 | Well drained |
| 1 | T9981 Fld3 | 2755654 | 4.599 | 16663851 | Chama | 3 | No | 85 | 100 | Well drained |
| 1 | T9981 Fld3 | 2755654 | 4.599 | 16663852 | Arnegard | 2 | No | 85 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525720 | 8.623 | 16663899 | Daglum | 33 | Yes | 176 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2525720 | 8.623 | 16663900 | Savage | 3 | No | 176 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525720 | 8.623 | 16663901 | Barkof | 2 | No | 176 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525720 | 8.623 | 16663902 | Rhoades | 2 | No | 176 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2525720 | 8.623 | 16663903 | Rhoades | 55 | Yes | 176 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2525720 | 8.623 | 16663904 | Belfield | 5 | No | 176 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2525724 | 0.458 | 16664017 | Savage | 30 | Yes | 85 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525724 | 0.458 | 16664018 | Daglum | 20 | Yes | 85 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2525724 | 0.458 | 16664019 | Grail | 8 | No | 85 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2525724 | 0.458 | 16664020 | Regent | 5 | No | 85 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525724 | 0.458 | 16664021 | Rhoades | 2 | No | 85 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2525724 | 0.458 | 16664022 | Belfield | 35 | Yes | 85 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2525730 | 31.514 | 16663990 | Daglum | 2 | No | 85 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2525730 | 31.514 | 16663991 | Regent | 68 | Yes | 85 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525730 | 31.514 | 16663992 | Savage | 17 | Yes | 85 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525730 | 31.514 | 16663993 | Cabba | 2 | No | 85 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525730 | 31.514 | 16663994 | Grail | 6 | No | 85 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2525730 | 31.514 | 16663995 | Moreau | 5 | No | 85 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525745 | 62.205 | 16663920 | Farnuf | 12 | No | 150 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525745 | 62.205 | 16663921 | Shambo | 75 | Yes | 150 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525745 | 62.205 | 16663922 | Arnegard | 10 | No | 150 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525745 | 62.205 | 16663923 | Amor | 3 | No | 150 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525746 | 63.55 | 16663924 | Arnegard | 10 | No | 156 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525746 | 63.55 | 16663925 | Farnuf | 8 | No | 156 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525746 | 63.55 | 16663926 | Amor | 4 | No | 156 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525746 | 63.55 | 16663927 | Shambo | 78 | Yes | 156 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525754 | 23.138 | 16663598 | Heil | 3 | No | 150 | 100 | Poorly drained |
| 2 | T9981 Fld4 | 2525754 | 23.138 | 16663599 | Rhoades | 4 | No | 150 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2525754 | 23.138 | 16663600 | Daglum | 2 | No | 150 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2525754 | 23.138 | 16663601 | Vanda | 5 | No | 150 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525754 | 23.138 | 16663602 | Harriet | 75 | Yes | 150 | 100 | Poorly drained |
| 2 | T9981 Fld4 | 2525754 | 23.138 | 16663603 | Regan | 6 | No | 150 | 100 | Poorly drained |
| 2 | T9981 Fld4 | 2525754 | 23.138 | 16663604 | Glenross | 5 | No | 150 | 100 | Poorly drained |
| 2 | T9981 Fld4 | 2525767 | 3.86 | 16663540 | Water | 100 | Yes | 100 | 100 | NULL |
| 2 | T9981 Fld4 | 2525769 | 103.909 | 16663985 | Belfield | 48 | Yes | 176 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2525769 | 103.909 | 16663986 | Grail | 5 | No | 176 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2525769 | 103.909 | 16663987 | Daglum | 40 | Yes | 176 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2525769 | 103.909 | 16663988 | Savage | 5 | No | 176 | 100 | Well drained |
| 2 | T9981 Fld4 | 2525769 | 103.909 | 16663989 | Rhoades | 2 | No | 176 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2755639 | 0.443 | 16663552 | Regent | 3 | No | 80 | 100 | Well drained |
| 2 | T9981 Fld4 | 2755639 | 0.443 | 16663553 | Lawther | 2 | No | 80 | 100 | Well drained |
| 2 | T9981 Fld4 | 2755639 | 0.443 | 16663554 | Savage | 62 | Yes | 80 | 100 | Well drained |
| 2 | T9981 Fld4 | 2755639 | 0.443 | 16663555 | Grail | 18 | Yes | 80 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2755639 | 0.443 | 16663556 | Belfield | 8 | No | 80 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2755639 | 0.443 | 16663557 | Daglum | 2 | No | 80 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2755639 | 0.443 | 16663558 | Farland | 5 | No | 80 | 100 | Well drained |
| 2 | T9981 Fld4 | 2755643 | 9.641 | 16663956 | Telfer | 3 | No | 88 | 100 | Somewhat excessively drained |
| 2 | T9981 Fld4 | 2755643 | 9.641 | 16663957 | Flasher | 30 | Yes | 88 | 100 | Somewhat excessively drained |
| 2 | T9981 Fld4 | 2755643 | 9.641 | 16663958 | Vebar | 40 | Yes | 88 | 100 | Well drained |
| 2 | T9981 Fld4 | 2755643 | 9.641 | 16663959 | Tally | 18 | Yes | 88 | 100 | Well drained |
| 2 | T9981 Fld4 | 2755643 | 9.641 | 16663960 | Parshall | 5 | No | 88 | 100 | Well drained |
| 2 | T9981 Fld4 | 2755643 | 9.641 | 16663961 | Amor | 4 | No | 88 | 100 | Well drained |
| 2 | T9981 Fld4 | 2755648 | 11.382 | 16663766 | Reeder | 58 | Yes | 156 | 100 | Well drained |
| 2 | T9981 Fld4 | 2755648 | 11.382 | 16663767 | Janesburg | 20 | Yes | 156 | 100 | Well drained |
| 2 | T9981 Fld4 | 2755648 | 11.382 | 16663768 | Amor | 10 | No | 156 | 100 | Well drained |
| 2 | T9981 Fld4 | 2755648 | 11.382 | 16663769 | Dogtooth | 5 | No | 156 | 100 | Well drained |
| 2 | T9981 Fld4 | 2755648 | 11.382 | 16663770 | Regent | 3 | No | 156 | 100 | Well drained |
| 2 | T9981 Fld4 | 2755648 | 11.382 | 16663771 | Belfield | 2 | No | 156 | 100 | Moderately well drained |
| 2 | T9981 Fld4 | 2755648 | 11.382 | 16663772 | Barkof | 2 | No | 156 | 100 | Well drained |

### Flooding Frequency and Ponding Frequency

CREATE TABLE #pf

( aoiid INT,

landunit CHAR(20),

mukey INT,

mapunit\_acres FLOAT,

cokey INT ,

cname CHAR(60),

copct INT,

majcompflag CHAR(3),

flodfreq CHAR(20),

pondfreq CHAR(20), major\_mu\_pct\_sum INT,

mu\_pct\_sum INT);

INSERT INTO #pf

SELECT DISTINCT

aoiid,

landunit,

M44.mukey,

FORMAT ( mapunit\_acres , '#,###,##0.00') AS mapunit\_acres ,

M44.cokey AS cokey,

M44.compname AS cname,

M44.comppct\_r AS copct ,

M44.majcompflag AS majcompflag,

(SELECT TOP 1 flodfreqcl FROM comonth, MetadataDomainMaster AS MD, MetadataDomainDetail AS DD WHERE comonth.cokey = M44.cokey and flodfreqcl = ChoiceLabel and DomainName = 'flooding\_frequency\_class' and

MD.DomainID = DD.DomainID order by choicesequence desc) as flodfreq,

(SELECT TOP 1 pondfreqcl FROM comonth, MetadataDomainMaster AS MD, MetadataDomainDetail AS DD WHERE comonth.cokey = M44.cokey and pondfreqcl = ChoiceLabel and DomainName = 'ponding\_frequency\_class' and

MD.DomainID = DD.DomainID order by choicesequence desc) as pondfreq,

major\_mu\_pct\_sum ,mu\_pct\_sum

FROM #M4 AS M44

INNER JOIN comonth AS CM ON M44.cokey = CM.cokey AND M44.majcompflag = 'Yes'

AND CASE

WHEN (flodfreqcl IN ('occasional', 'common', 'frequent', 'very frequent')) THEN 1

WHEN (pondfreqcl IN ('occasional', 'common', 'frequent')) THEN 1

ELSE 2 END = 1

GROUP BY aoiid, landunit, M44.mukey, mapunit\_acres, major\_mu\_pct\_sum,mu\_pct\_sum, M44.cokey,M44.compname , M44.majcompflag, M44.comppct\_r, flodfreqcl, pondfreqcl

* The assessment triggers a soil data web service to determine flooding frequency rating of occasional, frequent, or very frequent.
* The assessment triggers a soil data web service to determine ponding frequency rating of occasional, common or frequent.

| **aoiid** | **landunit** | **mukey** | **mapunit\_acres** | **cokey** | **cname** | **copct** | **majcompflag** | **flodfreq** | **pondfreq** | **major\_mu\_pct\_sum** | **mu\_pct\_sum** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | T9981 Fld3 | 2525754 | 12.64 | 16663602 | Harriet | 75 | Yes | Occasional | Rare | 75 | 100 |
| 1 | T9981 Fld3 | 2525764 | 17.69 | 16663611 | Regan | 55 | Yes | Occasional | Rare | 55 | 100 |
| 2 | T9981 Fld4 | 2525754 | 23.14 | 16663602 | Harriet | 75 | Yes | Occasional | Rare | 75 | 100 |

CREATE TABLE #pf1

( aoiid INT,

landunit CHAR(20),

landunit\_acres FLOAT,

mukey INT,

mapunit\_acres FLOAT,

cokey INT ,

cname CHAR(60),

copct INT,

majcompflag CHAR(3),

flodfreq CHAR(20),

pondfreq CHAR(20),

major\_mu\_pct\_sum INT, mu\_pct\_sum INT,

adj\_comp\_pct FLOAT

);

INSERT INTO #pf1

SELECT DISTINCT pf.aoiid, pf.landunit, landunit\_acres, mukey, mapunit\_acres, cokey, cname, copct, majcompflag, flodfreq, pondfreq , major\_mu\_pct\_sum, mu\_pct\_sum, (1.0 \* copct / major\_mu\_pct\_sum) AS adj\_comp\_pct

FROM #AoiAcres

LEFT OUTER JOIN #pf AS pf ON pf.aoiid=#AoiAcres.aoiid

GROUP BY pf.aoiid, pf.landunit, landunit\_acres, mukey, mapunit\_acres, cokey, cname, copct, majcompflag, flodfreq, pondfreq , major\_mu\_pct\_sum, mu\_pct\_sum

| **aoiid** | **landunit** | **landunit\_acres** | **mukey** | **mapunit\_acres** | **cokey** | **cname** | **copct** | **majcompflag** | **flodfreq** | **pondfreq** | **major\_mu\_pct\_sum** | **mu\_pct\_sum** | **adj\_comp\_pct** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | T9981 Fld3 | 328.952 | 2525754 | 12.64 | 16663602 | Harriet | 75 | Yes | Occasional | Rare | 75 | 100 | 1 |
| 1 | T9981 Fld3 | 328.952 | 2525764 | 17.69 | 16663611 | Regan | 55 | Yes | Occasional | Rare | 55 | 100 | 1 |
| 2 | T9981 Fld4 | 318.722 | 2525754 | 23.14 | 16663602 | Harriet | 75 | Yes | Occasional | Rare | 75 | 100 | 1 |

# Normalizing Component Percent’s and Calculating Components Acres From Intercepted Polygon

CREATE TABLE #pf2

( aoiid INT,

landunit CHAR(20),

landunit\_acres FLOAT,

mukey INT,

mapunit\_acres FLOAT,

cokey INT,

cname CHAR(60),

copct INT,

major\_MU\_pct\_sum INT, MU\_pct\_sum INT,

adj\_comp\_pct FLOAT,

co\_acres FLOAT

);

TRUNCATE TABLE #pf2

INSERT INTO #pf2

SELECT aoiid, landunit, landunit\_acres, mukey, mapunit\_acres, cokey, cname, copct, major\_MU\_pct\_sum, MU\_pct\_sum, adj\_comp\_pct, ROUND ( (adj\_comp\_pct \* mapunit\_acres), 2) AS co\_acres

FROM #pf1;

| **aoiid** | **landunit** | **landunit\_acres** | **mukey** | **mapunit\_acres** | **cokey** | **cname** | **copct** | **major\_MU\_pct\_sum** | **MU\_pct\_sum** | **adj\_comp\_pct** | **co\_acres** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | T9981 Fld3 | 328.952 | 2525754 | 12.64 | 16663602 | Harriet | 75 | 75 | 100 | 1 | 12.64 |
| 1 | T9981 Fld3 | 328.952 | 2525764 | 17.69 | 16663611 | Regan | 55 | 55 | 100 | 1 | 17.69 |
| 2 | T9981 Fld4 | 318.722 | 2525754 | 23.14 | 16663602 | Harriet | 75 | 75 | 100 | 1 | 23.14 |

SELECT landunit, ROUND (landunit\_acres,2) landunit\_acres, ROUND (SUM (co\_acres),2) AS ponding\_flooding\_acres,

CASE WHEN ROUND (SUM (co\_acres),2) IS NOT NULL THEN CONCAT ('Ponding or Flooding' , ':' , 1)

WHEN ROUND (SUM (co\_acres),2) = 0 THEN CONCAT ('Ponding or Flooding' , ':' , 0)

WHEN ROUND (SUM (co\_acres),2) IS NULL THEN CONCAT ('Ponding or Flooding', ':' , 'Not Rated')

END AS rating\_key,

'Ponding or Flooding' AS attributename

FROM #pf2

GROUP BY landunit, landunit\_acres

ORDER BY landunit;

| **landunit** | **landunit\_acres** | **ponding\_flooding\_acres** | **rating\_key** | **attributename** |
| --- | --- | --- | --- | --- |
| T9981 Fld3 | 328.95 | 30.33 | Ponding or Flooding:1 | Ponding or Flooding |
| T9981 Fld4 | 318.72 | 23.14 | Ponding or Flooding:1 | Ponding or Flooding |

## References

1. U.S. Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_054242> (accessed July 2015).
2. Soil Survey Staff. 2015. Soil Survey Geographic (SSURGO) Database. USDA Natural Resources Conservation Service. <https://catalog.data.gov/dataset/soil-survey-geographic-ssurgo-database-for-various-soil-survey-areas-in-the-united-states-> (accessed July 2015).