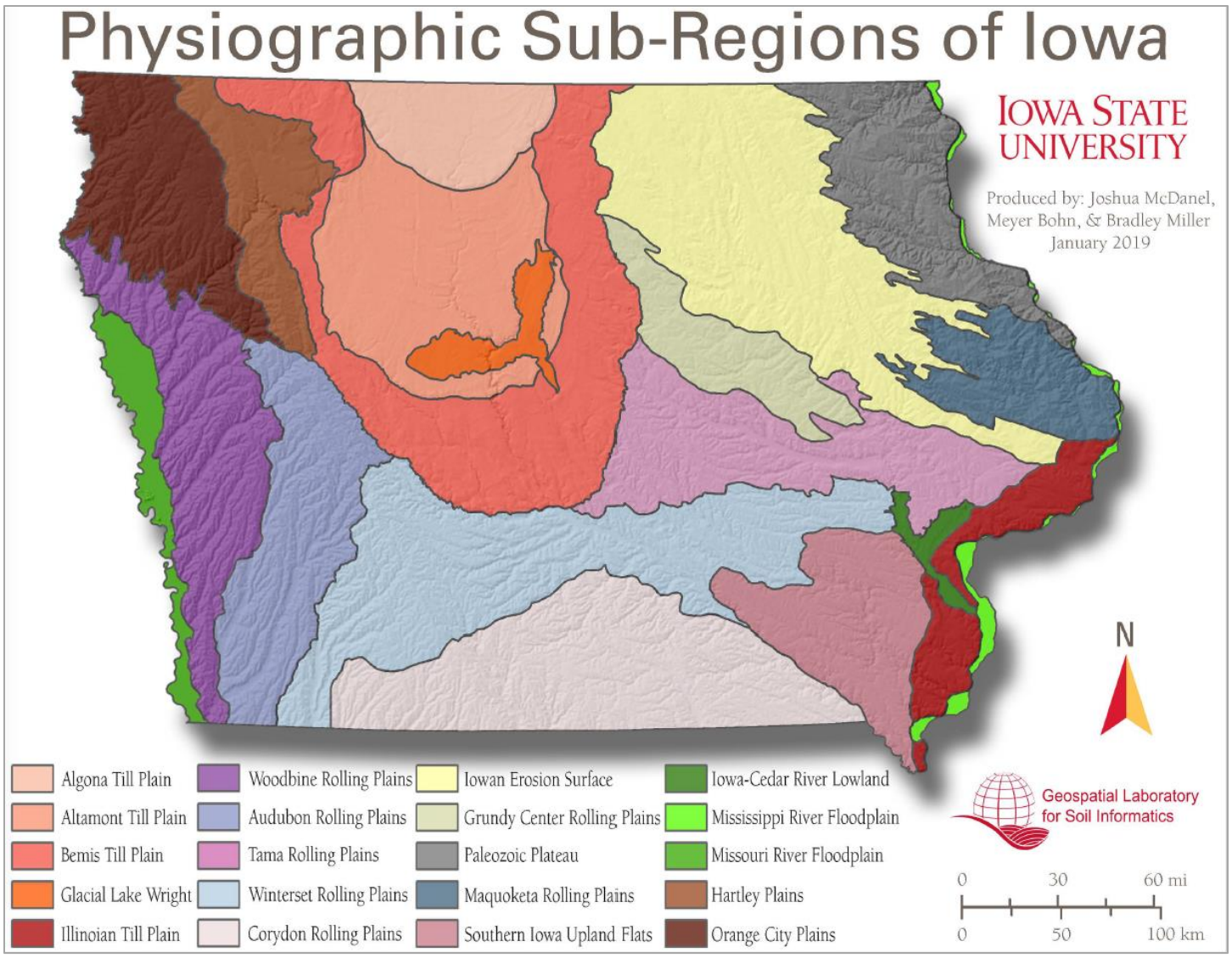

Missouri River Floodplain – This flat, fertile plain occupied by the Missouri River was formed from the meandering of the river eroding and depositing fertile combinations of sand, silt, clay and gravel within its existing deposits, surrounded by loess bluffs on both sides.

According to the April 1990 Geological Survey Bureau of the Iowa DNR, 'The entire (North American) western river system is characterized by an entrenched drainage network that presents unique management problems and land-use hazards. The drainage system is developed in easily eroded materials and the streams are characterized by flash flows and high sediment discharge. Bed and bank instability problems are widespread and costly to maintain or repair.'

The challenges with farming in this region are related to the drainage class of the soils which are either very poorly drained or excessively drained, both of which make growing crops a challenge and installing tile is not very effective due to the shallow depth to water table. Flood frequency makes this region challenging as well. Slope would be the least challenging aspect as a majority of the region is classified as summit or toeslope and the median slope is 0.

With a 0% median slope gradient, there are very few convex, concave or straight downhill areas as illustrated by the distribution of hillslope positions in the subregion: Summit (typically flat): (38%) Shoulder (typically convex): (4%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (8%) Footslope (typically concave): (4%) Toeslope (typically flat): (46%) The Missouri River Floodplain is a bit flatter than that of the Mississippi River.

Dominant Soil Series: Luton (21%), Albaton (11%), Haynie (7%), Onawa (6%)

The **Luton** series consists of very deep, poorly and very poorly drained flood plain soils formed in clayey soil deposits. The **Albaton** series are similarly very deep, poorly or very poorly drained also on flood plains, but are chalkier soils containing calcium carbonate. Both soils have a frequently saturated zone that occurs within a depth of a foot during March to June in normal years. Permeability is slow or very slow in both soils. Flooding from precipitation events and snowmelt rarely or only occasionally occurs for brief periods during the months of February to November in normal years. Slopes range from 0 to 2 percent. Albaton series streambank overflow is limited where dams and levees protect areas. It can pond up to a foot of water above the surface for long periods during late winter and spring in normal years and after heavy precipitation events.

Dominant Land Uses: Row Crop (78%), Developed (10%), Grassland/Pasture (6%)

Vegetation: Most areas have been drained or have been land graded and are cultivated. The principal crops are corn, soybeans, small grains and wheat. For landowners interested in adding native Vegetation, use tall grass prairie that are tolerant of excessive wetness. In Iowa this includes Bluejoint Grasses, White Cutgrasses, Fox Sedges, Oval Sedges, Inland Rushes, Torreys Rushes, Dark Green Bulrushes, Flatstem Spikerushes, Blue Vervains, Indian Hemps, Winged Loosestrifes, Wild Mints, and Water Horehound. (Source: Iowa State Office, Natural Resources Conservation Service, Des Moines, IA.)

Mississippi River Floodplain – This flat, fertile plain occupied by the Mississippi River formed from the meandering of the river eroding and depositing fertile combinations of sand, silt, clay and gravel within its existing deposits. According to the April 1990 Geological Survey Bureau of the Iowa DNR, 'The entire (North American) western river system is characterized by an entrenched drainage network that presents unique management problems and land-use hazards. The drainage system is developed in easily eroded materials and the streams are characterized by flash flows and high sediment discharge. Bed and bank instability problems are widespread and costly to maintain or repair.'

The challenges with farming in this region are related to the drainage class of the soils which are either very poorly drained or excessively drained, both of which make growing crops a challenge and installing tile is not very effective due to the shallow depth to water table. Flood frequency makes this region challenging as well. Slope would be the least challenging aspect as a majority of the region is classified as summit or toeslope and the median slope is 0.

With a 0% median slope gradient, there are very few convex, concave or straight downhill areas as illustrated by the distribution of hillslope positions in the subregion: Summit (typically flat): (27%) Shoulder (typically convex): (8%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (16%) Footslope (typically concave): (8%) Toeslope (typically flat): (42%) Although not as flat as the Missouri River Floodplain, there are very few areas of significant slope.

Dominant Soil Series: Caneek (33%), Coland (14%), Shaffton (9%), Titus (9%)

The **Caneek** series consists of very deep, somewhat poorly drained and poorly drained soils formed in 20 to 40 inches of stratified, (more than 15% calcium carbonate or chalk/limestone), silty alluvium (a deposit of clay, silt, sand, and gravel left by flowing streams in a river valley or delta, typically producing fertile soil), and in the underlying silty alluvium. These soils are on low stream terraces and floodplains. The **Coland** series consists of very deep, poorly drained soils formed by river erosion. These soils are on floodplains and fans in river valleys and upland drainageways in dissected till plains. Slopes range from 0 to 5 percent.

Dominant Land Uses: Row Crop (50%), Developed (17%), Grassland/Pasture (9%)

Vegetation: Most areas are pastured or cultivated. Where drained, the principal crops are corn, soybeans, small grains, and legume hays. A few areas are in permanent pasture with some scattered willow and cottonwood trees. For those in Iowa interested in integrating native vegetative cover, it is commonly inhabited with Prairie Cordgrasses, Bluejoint Grasses, Fox Sedges, Oval Sedges, Inland Rushes, New England Asters, Foxglove Penstemons, Cool Mountain Mints, Prairie Sundrops, Winged Loosestrifes.

Algona Till Plain – This region is the north-central portion of the Des Moines Lobe. It is mostly uncrossed by rivers or streams, with variable texture soils often calcareous with more than 15% calcium carbonate or chalk/limestone, and fractured, stratified loam to silt loam to sandy loam, a heterogenous mixture of clay, sand, gravel, and boulders. The topography is predominantly knob and kettle relief, meaning irregularly shaped hills from till accumulating on top of ice forming a mound when the ice melts, and depressions formed from melting blocks of ice enclosed in a drift. Upland hilltops are usually loam, while the upland swales are typically clay loam in soil texture.

This region has good topography and inherently good organic matter stocks in the soil for row cropping. Slopes are low allowing for large-scale row cropping. The big challenge in this region is the poorly drained soils. Tiling the soils can alleviate some of the drainage issues but even when drained some potholes will pond, especially in wet years.

With a 1% median slope gradient, there are very few convex, concave or straight downhill areas as illustrated by the distribution of hillslope positions in the subregion: Summit (typically flat): (21%) Shoulder (typically convex): (13%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (14%) Footslope (typically concave): (16%) Toeslope (typically flat): (37%)

Dominant Soil Series: Canisteo (21%), Clarion (21%), Nicollet (19%), Webster (9%)

The **Canisteo** soil series consists of very deep, poorly and very poorly drained soils that formed in calcium carbonate rich, loamy till or in a thin mantle of loamy or silty sediments and the underlying chalky, loamy till. A frequently saturated zone occurs at the surface to a depth of a foot during the wettest periods of years when precipitation is within one standard deviation of 30 year mean annual precipitation. These soils are on rims of depressions, depressions and flats on material left behind by a moving glacier or till plains. Slopes range from 0 to 2 percent.

The **Clarion** soil series consists of very deep, moderately well drained soils on uplands. These soils formed in glacial till and are on higher landscape positions on convex slopes and have a frequently saturated zone between depths of 4 to 6 feet during March to June in normal years during the wettest periods of years when precipitation is within one standard deviation of 30 year mean annual precipitation. Slopes range from 1 to 9 percent.

The **Nicollet** soil series consists of very deep, somewhat poorly drained soils that formed in (more than 15% calcium carbonate or chalk/limestone), loamy glacial till on till plains and moraines that crumble easily. They are in higher landscape positions on flats and rises. Nicollet soils are on till plains and ground and terminal moraines left by the retreating glacier. In an undrained condition, a frequently saturated zone occurs at the surface to a depth of a foot during the wettest periods of years when precipitation is within one standard deviation of 30 year mean annual precipitation. Slopes range from 0 to 5 percent.

Dominant Land Uses: Row Crop (85%), Urban (6%), Grassland/Pasture (6%)

Vegetation: Most areas are artificially drained and cultivated. The principal crops are corn, soybeans, small grains, and legume hay. Reed canarygrass commonly dominates partially drained pasture. Native Vegetation is predominantly wet-site tall prairie species such as prairie cordgrass, switchgrass, big bluestem, wooly sedge, giant goldenrod and Canada goldenrod. The native Vegetation on very poorly drained ponded phases is herbaceous marsh species tolerant of excessive wetness such as, cattails, bulrushes, giant burreed, giant reed grass and hydrophytic sedges.

Altamont Till Plain – This region is the mid-central area of the Des Moines Lobe. It is mostly uncrossed by rivers or streams, associated with variable texture soils often more than 15% calcium carbonate or chalk/limestone, and fractured, stratified loam to silt loam to sandy loam, and a heterogenous mixture of clay, sand, gravel, with boulders. The ground relief is predominantly moraine, made up of material left behind by a moving glacier. Upland hilltops are usually loam, while the upland swales are typically clay loam in soil texture.

This region has good topography and inherently good organic matter stocks in the soil for row cropping. Slopes, though slightly higher than the Algona Till Plain to the north, are low allowing for large-scale row cropping. The big challenge in this region is the poorly drained soils. Tiling the soils can alleviate some of the drainage issues but even when drained some potholes will pond especially in wet years.

With a 1% median slope gradient, there are very few convex, concave or straight downhill areas as illustrated by the distribution of hillslope positions in the subregion: Summit (typically flat): (26%) Shoulder (typically convex): (10%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (11%) Footslope (typically concave): (11%) Toeslope (typically flat): (42%)

Dominant Soil Series: Canisteo (21%), Clarion (19%), Webster (17%), Nicollet (15%)

The **Canisteo** soil series consists of very deep, poorly and very poorly drained soils that formed in calcium carbonate rich, loamy till or in a thin mantle of loamy or silty sediments and the underlying chalky, loamy till. a frequently saturated zone occurs at the surface to a depth of 1 foot during the wettest periods of years when precipitation is within one standard deviation of 30 year mean annual precipitation. These soils are on rims of depressions, depressions and flats on material left behind by a moving glacier or till plains. Slopes range from 0 to 2 percent.

The **Clarion** soil series consists of very deep, moderately well drained soils on uplands. These soils formed in glacial till and are on higher landscape positions on convex slopes and have a frequently saturated zone between depths of 4 to 6 feet during March to June in normal years during the wettest periods of years when precipitation is within one standard deviation of 30 year mean annual precipitation. Slopes range from 1 to 9 percent.

The **Webster** soil series consists of very deep, poorly drained, moderately permeable chalky soils formed in glacial till or local alluvium derived from till on uplands. A saturated zone occurs within depths of 0 to 6 inches during the wettest period in normal years in natural conditions. Slope ranges from 0 to 3 percent.

The **Nicollet** soil series consists of very deep, somewhat poorly drained soils that formed in calcium carbonate rich (more than 15%) chalky/limestone, loamy glacial till on till plains and moraines that crumbles easily. They are on higher landscape positions on flat and rises. Nicollet soils are on till plains, ground and terminal moraines left by the retreating glacier. In an undrained condition, a frequently saturated zone occurs at the surface to a depth of a foot during the wettest periods of years when precipitation is within one standard deviation of 30 year mean annual precipitation. Slopes range from 0 to 5 percent.

Dominant Land Uses: Row Crop (84%), Urban (7%), Grassland/Pasture (6%)

Vegetation: Most areas are artificially drained and cultivated. The principal crops are corn, soybeans, small grains, and legume hay. Reed canarygrass commonly dominates partially drained pasture. Native Vegetation is predominantly wet-site tall prairie species such as prairie cordgrass, switchgrass, big bluestem, little bluestem wooly sedge, giant goldenrod and Canada goldenrod. The native Vegetation on very poorly drained ponded phases is herbaceous marsh species tolerant of excessive wetness such as, cattails, bulrushes, giant burreed, giant reed grass and hydrophytic sedges.

Glacial Lake Wright – This is an area of the mid-central Des Moines Lobe where a Glacial Lake formed creating soils that differ from other area of the Des Moines Lobe. It is mostly a glacial lake plain uncrossed by rivers or streams, created by the Late Wisconsinan glaciation, associated with the 'Dows Formation' that includes all upland glaciation deposits on the Des Moines Lobe with distinctive clay mineralogy. Typical soil texture silty clay loam.

Like the Altamont Till Plain in which this region lies, topography and inherently good organic matter stocks in the soil are good for large-scale row cropping. The challenge in this region is the poorly drained soils. These soils are slightly better drained than those to the north in the Algona and Altamont Till Plains and have fewer potholes, so tiling can alleviate some of the drainage issues. When originally mapped, soils in this region had patchy, thin layers of silt or clay that are

often indicative of lake deposited vs ice deposited soils. Years of agricultural practices have largely erased evidence of this, but some summit areas may still have more silty or clayey soil deposits.

With a 1% median slope gradient, there are very few convex, concave or straight downhill areas as illustrated by the distribution of hillslope positions in the subregion: Summit (typically flat): (29%) Shoulder (typically convex): (11%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (10%) Footslope (typically concave): (11%) Toeslope (typically flat): (39%)

Dominant Soil Series: Brownton (16%), Marna (13%), Kossuth (12%), Ottosen (11%)

Each of the soils encompassing above 10% of the subregion has similar characteristics having been formed in the same glacial lake. The **Brownton** and **Marna** soil series consists of very deep, poorly drained silty clay loam soils. Brownton formed in 30 to 60 or more inches of clayey sediments from a glacial lake or in sediments and underlying loamy glacial till and Marna in about 24 to 40 inches. These soils are on glacial lake plains or landscapes created by glacial movement. They have slow permeability. Surface runoff is slow. Their slopes are less than 2 percent.

Dominant Land Uses: Row Crop (84%), Urban (6%), Grassland/Pasture (5%)

Vegetation: Most of these soils are cropped to corn and soybeans. Native Vegetation was a wet-site community of the tall grass prairie species such as prairie cordgrass, switchgrass, big bluestem, wooly sedge, giant goldenrod and Canada goldenrod.

Bemis Till Plain – This is the oldest part of the Des Moines Lobe with the most irregular topography. It surrounds the Algona and Altamont till plains and extends further to the south. It is partially crossed by streams and rivers and has variable texture soils often chalky with calcium carbonate and layered with loam to silt loam or sandy loam, a heterogenous mixture of clay, sand, gravel, and boulders. The ground is predominantly moraine which is material left behind by a moving glacier. Upland hilltops are usually loam, while the upland depressions or channels are typically clay loam in soil texture.

Although poorly drained soils and potholes also dot the landscape in this subregion of the Des Moines Lobe, the concentration of poorly drained soils in this region is the lowest of the Des Moines lobe subregions. This region has slightly higher slopes and less extensive flat areas than the northern Algona and Altamont till plains subregions, but good organic matter and complimentary topography make this region good for growing crops.

Although not quite as flat as other areas of the Des Moines Lobe, with a 2% median slope gradient, there are relatively few significantly convex, concave or straight downhill areas as illustrated by the distribution of hillslope positions in the subregion: Summit (typically flat): (18%) Shoulder (typically convex): (13%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (20%) Footslope (typically concave): (16%) Toeslope (typically flat): (33%)

Dominant Soil Series: Clarion (29%), Nicollet (13%), Webster (13%), Canisteo (11%)

The **Clarion** soil series consists of very deep, moderately well drained soils on uplands. These soils formed in glacial till and are on higher landscape positions on convex slopes and have a frequently saturated zone between depths of 4 to 6 feet during March to June in normal years during the wettest periods of years when precipitation is within one standard deviation of 30 year mean annual precipitation. Slopes range from 1 to 9 percent. Mean air annual temperature is about 48 degrees F.

The **Nicollet** soil series consists of very deep, somewhat poorly drained soils that formed in calcium carbonate rich (more than 15%) chalky/limestone, loamy glacial till on till plains and moraines that crumble easily. They are in higher landscape positions on flat and rises. Nicollet soils are on till plains, ground and terminal moraines left by the retreating glacier. In an undrained condition, a frequently saturated zone occurs at the surface to a depth of a foot during the

wettest periods of years when precipitation is within one standard deviation of 30 year mean annual precipitation. Slopes range from 0 to 5 percent.

The **Webster** soil series consists of very deep, poorly drained, moderately permeable chalky soils formed in glacial till or local alluvium derived from till on uplands. A saturated zone occurs within depths of 0 to 6 inches during the wettest period in normal years in natural conditions. Slopes range from 0 to 3 percent.

The **Canisteo** soil series consists of very deep, poorly and very poorly drained soils that formed in calcium carbonate rich, loamy till or in a thin mantle of loamy or silty sediments and the underlying chalky, loamy till. a frequently saturated zone occurs at the surface to a depth of 1 foot during the wettest periods of years when precipitation is within one standard deviation of 30 year mean annual precipitation. These soils are on rims of depressions, depressions and flats on material left behind by a moving glacier or till plains. Slopes range from 0 to 2 percent.

Dominant Land Uses: Row Crop (75%), Urban (10%), Grassland/Pasture (9%)

Vegetation: Most areas are artificially drained and cultivated. The principal crops are corn, soybeans, small grains, and legume hay. Reed canarygrass commonly dominates partially drained pasture. Native Vegetation is predominantly wet-site tall prairie species such as prairie cordgrass, switchgrass, big bluestem, little bluestem wooly sedge, giant goldenrod and Canada goldenrod. The native Vegetation on very poorly drained ponded phases is herbaceous marsh species tolerant of excessive wetness such as, cattails, bulrushes, giant burreed, giant reed grass and hydrophytic sedges.

Hartley Plains – These plains are just west of the northern and central Des Moines Lobe compromised of older glacial till than the Des Moines Lobe capped by loess. Soils are calcium carbonate rich. The landscape is some of the easiest to farm if the weather isn't in drought, capped by up to 6.5 feet of silty clay loam Peoria Loess. It lacks uneven features like potholes and knobs, is rich in organic matter and drains well but can store moisture.

With a slightly more challenging topography to farm at a large scale than the Des Moines Lobe subregions, this subregion makes up for topographical irregularity with ideal drainage and no obvious challenges to growing row crops, which has resulted in higher land values.

Although not quite as flat as the Des Moines Lobe, with a 2% median slope gradient, there are relatively few significantly convex, concave or straight downhill areas as illustrated by the distribution of hillslope positions in the subregion: Summit (typically flat): (26%) Shoulder (typically convex): (14%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (14%) Footslope (typically concave): (16%) Toeslope (typically flat): (29%)

Dominant Soil Series: Galva (20%), Sac (14%), Primghar (14%), Marcus (5%)

The **Galva** soil series consists of very deep, well drained soils on uplands and loess covered stream terraces. A saturated zone does not occur within a depth of 6 feet during April to June in most years. These soils formed in loess, a fine, mineral-rich material from glaciers grinding rocks to a fine powder and wind-blown dust. Slopes range from 0 to l5 percent.

The **Sac** soil series consists of very deep, moderately well drained soils formed in 20 to 40 inches of loess and in the underlying till. A frequently saturated zone occurs between depths of 2 and 3 feet during the wettest periods of years when precipitation is within one standard deviation of the 30 year mean of annual precipitation, this saturation may rise above the water table for transitory periods. These soils occur on ridgetops and convex side slopes on the till plain. Slope ranges from 0 to 14 percent.

The **Primghar** soil series consists of very deep, somewhat poorly drained, silty clay loam soils formed in loess on uplands flats and high stream benches but are found also at lower elevations in depressions or channels and have a saturated zone within depths of 1 to 3.5 feet during the wettest period of most years. Surface runoff low. Slopes range from 0 to 5

percent. A coarser-textured band as much as 6 inches thick is between the loess and till in most sample areas. Terrace phases are recognized. They have layers of gravel or sand.

Dominant Land Uses: Row Crop (81%), Grassland/Pasture (8%), Developed (7%)

Vegetation: Most areas are cultivated. The principal crops are corn, soybeans, small grains, and legume hay. The native Vegetation is big bluestem, little bluestem, indiangrass, switchgrass, and other grasses of the tall grass prairie.

Orange City Plains – This Plain from the Pre-Illinoian glaciation that is mostly crossed by streams or rivers. The landscape capped by up to 6.5 feet of silty clay loam Peoria Loess. Unlike the Hartley Plains, this region lacks significant exposure of any calcium carbonate or chalky/limestone till and contains steeper backslopes.

Although this subregion has a slightly more challenging topography to farm at a large scale than the Des Moines Lobe or the Hartley Plains subregion, ideal drainage, deep loess and no obvious challenges to growing row crops has resulted in higher land values. A larger percentage of backslopes means that erosion can be more of a challenge here than the flatter subregions in central Iowa.

With a median slope gradient of 3%, the possibility of erosion only increases with longer and steeper backslopes. The distribution of hillslope positions for this subregion is: Summit (typically flat): (16%) Shoulder (typically convex): (17%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (30%) Footslope (typically concave): (19%) Toeslope (typically flat): (18%)

Dominant Soil Series: Galva (49%), Primghar (9%), Moody (7%), Colo (5%)

The **Galva** soil series consists of very deep, well drained soils on uplands and loess covered stream terraces. A saturated zone does not occur within a depth of 6 feet during April to June in most years. These soils formed in loess, a fine, mineral-rich material from glaciers grinding rocks to a fine powder and wind-blown dust. Slopes range from 0 to l5 percent.

Dominant Land Uses: Row Crop (83%), Grassland/Pasture (8%), Developed (7%)

Vegetation: Most areas are cultivated. The principal crops are corn, soybeans, small grains, and legume hay. The native Vegetation is big bluestem, little bluestem, indiangrass, switchgrass, and other grasses of the tall grass prairie.

Woodbine Rolling Plains– This is a landscape with branching streams and a drainage pattern formed in an earlier glaciation than the Des Moines Lobe. The area has an underlying, older, glacial limestone formation (Alburnett) with a younger one (Wolf Creek) on top. This landscape is capped by up to 200 feet of silt loam loess, and an underlying stratified sequence of sand, silt, and gravel. Hardened layers of sediment and their relationship to one another suggest that soils evolved from a river environment into a low-energy slack water environment. Eroded backslopes will show signs of calcium carbonate within the silt loam loess.

Topography is the biggest challenge for farming in this subregion. The high slopes add challenges for row cropping in addition to increasing the likelihood of erosion. This subregion has the state's highest rates of erosion making practices like terraces necessary to manage soil loss. Thanks to a deep layer of loess, the subregion has idea drainage. High levels of erosion have reduced organic matter in places creating farming challenges.

This subregion has a median slope gradient of 9% and a very high potential for significant erosion on longer and steeper backslopes. The distribution of hillslope positions for this subregion is: Summit (typically flat): (7%) Shoulder (typically convex): (6%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (72%) Footslope (typically concave): (8%) Toeslope (typically flat): (8%)

Dominant Soil Series: Monona (34%), Ida (25%), Napier (16%), Judson (6%)

The **Monona** soil series consists of very deep, well drained soils formed in loess. These soils are on areas of higher ground between rivers and side slopes on loess hills and on risers and treads on stream terraces in river valleys. Saturation does not occur within a depth of 6 feet during the wettest periods of most years. Slope ranges from 0 to 40 percent.

The **Ida** soil series consists of very deep, well drained soils formed in loess with calcium carbonate. These soils are on side slopes and crests on stream-crossed till plains and on risers on stream terraces. Saturation does not occur within a depth of 6 feet during the wettest periods of most years. Slopes range from 2 to 60 percent.

The **Napier** soil series consists of very deep, well drained soils on foot slopes, upland drainageways, and alluvial fans. A frequently saturated zone does not occur within a depth of 6 feet during April to June in normal years.
These soils formed from accumulations at the foot of steep slopes or deposited by flowing streams and derived from loess. Slopes range from 0 to 20 percent.

Dominant Land Uses: Row Crop (66%), Grassland/Pasture (17%), Forest (8%)

VEGETATION: The areas with less slope are cultivated. Some steeply sloping areas are forested or pastured. The principal crops are corn, soybeans, small grains, and hay. The native Vegetation is big bluestem, little bluestem, indiangrass, switchgrass, and other grasses of the tall grass prairie.

Audubon Rolling Plains – Like the Woodbine Rolling Plains, this is a landscape with branching streams and a drainage pattern formed in an earlier glaciation than the Des Moines Lobe. Slopes, on average, are not quite as steep as the neighboring plains to the West. The area has an underlying, older, glacial limestone formation (Alburnett) with a younger one (Wolf Creek) on top. This landscape is capped by up to 65 feet of silt loam loess, and an underlying stratified sequence of sand, silt, and gravel. Hardened layers of sediment and their relationship to one another suggest that soils evolved from a river environment into a low-energy slack water environment. Eroded backslopes will show signs of calcium carbonate within the silt loam loess.

The topography in this subregion is less steep than the Woodbine Rolling Plains to the west making it easier to manage even though the loess is not quite as thick. Relatively high slopes add challenges for row cropping in addition to increasing the likelihood of erosion. Practices like terraces are necessary to manage soil loss. Thanks to a layer of loess, the subregion has idea drainage. Erosion has reduced organic matter in places creating some farming challenges.

This subregion has a median slope gradient of 6% and a very high potential for significant erosion on longer and steeper backslopes. The distribution of hillslope positions for this subregion is: Summit (typically flat): (9%) Shoulder (typically convex): (9%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (62%) Footslope (typically concave): (11%) Toeslope (typically flat): (9%)

Dominant Soil Series: Marshall (39%), Exira (16%), Judson (12%), Colo (8%)

The **Marshall** series consists of very deep, well drained silty clay loam soils formed in loess. These soils are on areas of higher ground between rivers and hill slopes on uplands and on risers and treads on stream terraces. A frequently saturated zone does not occur within a depth of 6 feet during the wettest periods of normal years. Slope ranges from 0 to 25 percent.

The **Exira** series consists of very deep, well drained soils formed in loess. These soils are on side slopes and head slopes on dissected till plains and risers on stream terraces. Saturation does not occur within a depth of 6 feet during the wettest periods of most years. Surface runoff potential--medium or high. Slope ranges from 5 to 30 percent.

The **Judson** series consists of very deep, well drained soils formed in silty soil at the foot of steep slopes derived from non-calcium carbonate rich loess. These soils are on foot slopes, upland drainageways, and alluvial fans. A frequently

saturated zone does not occur within a depth of 6 feet during the wettest periods of years when precipitation is within one standard deviation of the 30 year mean of annual precipitation Slope ranges from 0 to 12 percent.

Dominant Land Uses: Row Crop (78%), Grassland/Pasture (10%), Urban (6%)

Vegetation: The more gently sloping areas are cultivated. The principal crops are corn, small grains, soybeans, and legume/alfalfa hay. The more steeply sloping areas are used for hay production or are pastured. The native Vegetation is big bluestem, little bluestem, switchgrass, and other grasses of the tall grass prairie.

Tama Rolling Plains – This region to the east of the lower Des Moines Lobe is crossed by streams and rivers with a branching drainage pattern. Slopes, on average, are less steep than the Audubon Rolling Plains to the west but greater than areas of the younger Des Moines Lobe. The subregion has an underlying, older, glacial limestone formation (Alburnett) with a younger one (Wolf Creek) on top. This landscape is capped by up to 65 feet of silt loam loess, and an underlying stratified sequence of sand, silt, and gravel. As loess was blown east from the Missouri River and Woodbine Rolling Plains across the Audubon Rolling Plains, the heavier particles dropped out making this loess a bit finer with an increased clay content. Although not as deep as the loess in Northwest Iowa, the soils here are nearly equally productive. Due to topography, however, field sizes are necessarily smaller than some of the flat tracts of the Hartley and Orange City Plains.

Farming in this subregion is very similar to the Audubon rolling plains to the west, but lower slopes make management easier and reduce the amount of erosion compared to steeper areas. The loess texture here is finer due to being further from the source of the loess in Nebraska, but still creates ideal drainage.

With a median slope gradient of 4%, the possibility of erosion increases with length and steepness of backslopes. The distribution of hillslope positions for this subregion is: Summit (typically flat): (13%) Shoulder (typically convex): (11%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (51%) Footslope (typically concave): (12%) Toeslope (typically flat): (13%)

Dominant Soil Series: Tama (23%), Fayette (12%), Colo (11%), Downs (8%)

The Tama soil series consists of very deep, well drained soils silty clay loam formed in loess. A frequently saturated zone does not occur within a depth of 6 feet during the wettest periods of years when precipitation is within one standard deviation of 30 year mean of annual precipitation. These soils are on higher ground between rivers and side slopes on uplands and on treads or level strips of land, and risers or steeper strips of land on stream terraces in river valleys. Slope ranges from 0 to 20 percent.

The **Fayette** soil series consists of very deep, well drained soils formed in loess. These soils are on convex crests, higher ground between rivers and side slopes on uplands and on treads or level strips of land, and risers or steeper strips of land on high stream terraces. Saturation does not occur within a depth of 6 feet during the wettest periods of normal years. Surface runoff potential--negligible to high. Slope ranges from 0 to 60 percent.

The **Colo** soil series consists of very deep, poorly drained silty clay loam soils formed in running water. These soils are on floodplains, low stream terraces, alluvial fans, and upland drainageways. These soils are frequently saturated at the soil surface during the wettest portions of normal years and is considered apparent. Surface runoff potential is negligible to low. Rarely flooded to frequently flooded for very brief to long periods during the months of February to November from precipitation events and snowmelt. Slopes range from 0 to 5 percent.

Dominant Land Uses: Row Crop (62%), Grassland/Pasture (16%), Urban (9%)

VEGETATION: Nearly level to gently sloping areas are cultivated. The principal crops are corn, soybeans, small grains, and legume hays. Steeper slopes are pastured, wooded or both wooded and pastured. The native Vegetation is

deciduous trees, mainly oak and hickory, big bluestem, little bluestem, switchgrass, and other grasses of the tall grass prairie.

Winterset Rolling Plains – This region to the south of the Des Moines Lobe is very different than areas further to the south. It is crossed by streams and rivers with a branching drainage pattern. Slopes, on average, are Steeper than the Tama Rolling Plains to the north and east. The subregion has an underlying, older, glacial limestone formation (Alburnett) with a younger one (Wolf Creek) on top. This landscape, like the Tama Rolling Plains is capped by silt loam loess, and an underlying stratified sequence of sand, silt, and gravel, but only about half as deep, up to 33 feet.

The big farming challenge here is if the loess has eroded down to expose the denser till to reduce some plant productivity. As loess was blown east from the Missouri River and Woodbine Rolling Plains across the Audubon Rolling Plains, the heavier particles dropped out making this loess a bit finer with an increased clay content, and due to erosion, backslopes consist more of clay loam and older glacial till soils. Despite lower depth of loess, these soils are often nearly as productive as those in Northwest Iowa. Due to topography, however, field sizes are necessarily smaller than some of the large, flat tracts of the Hartley and Orange City Plains.

This subregion has a median slope gradient of 6% and a very high potential for significant erosion on longer and steeper backslopes. The distribution of hillslope positions for this subregion is: Summit (typically flat): (12%) Shoulder (typically convex): 9%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (62%) Footslope (typically concave): (9%) Toeslope (typically flat): (8%)

Dominant Soil Series: Sharpsburg (17%), Ladoga (10%), Colo (9%), Shelby (7%)

The **Sharpsburg** soil series consists of very deep, moderately well drained silty clay loam soils formed in loess. These soils are on higher ground between rivers and hill slopes on uplands and on treads or level strips of land, and risers or steeper strips of land on stream terraces in river valleys. A frequently saturated zone occurs at depths between 4 and 6 feet during the wettest periods when precipitation is within one standard deviation of the 30 year mean of annual precipitation. Slope ranges from 0 to 18 percent.

The **Ladoga** soil series consists of very deep, moderately well drained silt loam soils formed in loess. These soils are on summits of higher ground between rivers, side slopes, and nose slopes on dissected till plains and treads or level strips of land, and risers or steeper strips of land on stream terraces. A frequently saturated zone occurs within a depth of 4 feet during April to June in normal years and is considered apparent. Surface runoff potential is negligible to high. Slope ranges from 0 to 30 percent.

Dominant Land Uses: Row Crop (55%), Grassland/Pasture (26%), Forest (11%)

VEGETATION: Most areas are cultivated. The principal crops are corn, soybean, small grain, and grass-legume hay. The native Vegetation is mixed big bluestem, little bluestem, switchgrass, western wheatgrass, sedges, blue grama other grasses of the tall grass prairie and deciduous trees (oak-hickory).

Corydon Rolling Plains –This landscape is significantly different than other subregions of the Southern Iowa Drift Plain. The soils are both more weathered and more compacted from heavier ice during glaciation. The landscape is crisscrossed rivers and streams with branching drainage patterns etched from the earliest glaciation period, associated with multiple glaciers and erosions.

The landscape is capped by comparatively much less silt loam loess than other subregions in this landform, only up to 13 feet leading to more issues where thin loess leads to a lot more areas that of till at the surface or close to the surface reducing row crop productivity. Due to weathering, backslopes consist largely of clay loam and much older till.

Although this subregion has a median slope gradient of 6% like the Winterset Rolling Plains, the soils and topography are different enough to significantly impact productivity. The distribution of hillslope positions for this subregion is: Summit (typically flat): (12%) Shoulder (typically convex): (9%) Backslope (Backslopes have the greatest potential for erosion with

water speed able to increase on any straight part of the down slope): (66%) Footslope (typically concave): (7%) Toeslope (typically flat): (6%)

Dominant Soil Series: Gara (10%), Armstrong (6%), Lindley (6%), Olmitz (5%)

The **Gara** soil series consists of very deep, well drained loam soils formed in till. These soils are on higher ground between rivers, side slopes, and nose slopes on stream crossed uplands. A frequently saturated zone does not occur within a depth of 6 feet during the wettest periods of years when precipitation is within one standard deviation of 30 year mean of annual precipitation. Slope ranges from 5 to 40 percent.

The **Armstrong** series consists of very deep, somewhat poorly drained loam soils formed in 10 to 20 inches of hillslope sediments or loess and in the underlying soil weathered from till. These soils are on side slopes and summits of higher ground between rivers on till plains. A frequently saturated zone occurs between depths of 1 and 3 feet during the wettest periods of years when precipitation is within one standard deviation of the 30 year mean of annual precipitation, and this saturation is considered perched, or above the water table. Slope ranges from 2 to 25 percent.

Dominant Land Uses: Row Crop (31%), Grassland/Pasture (26%), Forest (22%)

VEGETATION: More gently sloping areas are cultivated. More steeply sloping areas are pastured. The principal crops are corn, soybeans, oats, and grass-legume hay. The native Vegetation is mixed deciduous trees (oak and hickory) and big bluestem, little bluestem, switchgrass, and other grasses of the tall grass prairie.

Southern Iowa Upland Flats – This is a unique area of the Iowa landscape with relief characterized by upland flats and depressions that are atypical in the loess capped landscapes of Iowa, essentially, plateau-like flat areas with steep sides. The landscape includes rivers, streams and a branching drainage pattern from the earliest glaciation period in the state. The area was subjected to multiple glaciations and erosions, and the exact history of its topographical development is still speculative.

Like the Corydon Rolling Plains to the west, the landscape is capped by up to 13 feet of silty clay loam Loess from the most recent glacier, but the flat summits make the land easier to farm. However, due to weathering, backslopes consist largely of clay loam much older till which is not as productive and subject to erode, including soils from the summits.

With a median slope gradient of 4%, the possibility of erosion increases with length and steepness of backslopes. The distribution of hillslope positions for this subregion is: Summit (typically flat): (21%) Shoulder (typically convex): (11%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (50%) Footslope (typically concave): (8%) Toeslope (typically flat): (9%)

Dominant Soil Series: Lindley (8%), Mahaska (8%), Clinton (8%), Otley (7%)

The **Lindley** series consists of very deep, well drained, moderately slowly permeable loam soils on uplands and may have a thin mantle of loess. Permeability is moderately slow. Moderately wet units have a perched water table with an upper limit of 3.5 to 5.0 feet during November to April in most years. Slopes range from 5 to 60 percent.

The **Mahaska** series consists of very deep, somewhat poorly drained silty clay loam soils formed in loess. These soils are on summits of higher ground between rivers on dissected till plains and on treads or level strips of land, and risers or steeper strips of land on stream terraces. A frequently saturated zone occurs within depths of 1 to 3.5 feet sometime during April to June in normal years. Surface runoff potential is negligible to low. Slopes range from 0 to 5 percent.

Dominant Land Uses: Row Crop (56%), Grassland/Pasture (19%), Forest (17%)

VEGETATION: Cultivated soils are principally in corn, soybeans, small grains, and legume hay. Difficult to farm soil is mostly in second growth timber; some is native forest. Some areas are cleared and used mostly for growing hay or pasture crops. Native Vegetation is deciduous hardwoods (oak-hickory). The native Vegetation is big bluestem, little bluestem, switchgrass, and other grasses of the tall grass prairie.

Iowa-Cedar River Lowland –This subregion consists of two flat, fertile plains occupied by the Iowa River in the west fork and the Cedar River in the east fork. Formed from the meandering of the individual rivers eroding and incising into their own banks and soils. 'The entire (North American) western river system is characterized by an entrenched drainage network that presents unique management problems and land-use hazards. The drainage system is developed in easily eroded materials and the streams are characterized by flash flows and high sediment discharge. Bed and bank instability problems are widespread and costly to maintain or repair.'

The challenge with farming in this region is related to the drainage class of the soils which are either very poorly drained or excessively drained, both of which make growing crops a challenge and installing tile is not very effective due to the shallow depth to the water table. Flood frequency makes this region challenging as well. Slope would be the least challenging aspect as a majority of the region is classified as summit or toeslope and the median slope is 0.

With a 0% median slope gradient, there are very few convex, concave or straight downhill areas as illustrated by the distribution of hillslope positions in the subregion: Summit (typically flat): (29%) Shoulder (typically convex): (8%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (12%) Footslope (typically concave): (8%) Toeslope (typically flat): (43%)

Dominant Soil Series: Sparta (9%), Ambraw (6%), Colo (5%), Perks (5%)

This region often consists of larger areas of water than soils. The Sparta soil series consists of very deep, excessively drained loamy fine sand soils formed in sandy outwash that has been reworked by wind. These soils range from nearly level to very steep treads or level strips of land, and risers or steeper strips of land on stream terraces in river valleys, outwash terraces, outwash plains, and dune fields. A frequently saturated zone does not occur within a depth of 6 feet during the wettest periods of years when precipitation is within one standard deviation of the 30 year mean of annual precipitation. Flooding occurs very rarely or rarely flooded for very brief or brief duration on stream terrace position with slopes of less than 5 percent. Slope ranges from 0 to 40 percent.

Dominant Land Uses: Row Crop (56%), Wetland (19%), Grassland/Pasture (14%)

Vegetation: Most areas are cultivated. The principal crops are corn, small grain, and hay. Many areas are irrigated and used for vegetable crops such as sweet corn, beans, potatoes, and carrots. The native Vegetation is mixed big bluestem, little bluestem, switchgrass, other grasses of the tall grass prairie with widely spaced oak and hickory trees.

Illinoian Till Plain – This is the only part of Iowa with soils deposited by the Illinoian glacier from the northeast. The landscape includes rivers, streams and a branching drainage pattern, associated with the higher dolomite content with crystalline structure vs limestone which also contains biological material from fossils. This landscape is capped by up to 20 feet of silty clay loam Loess. Backslopes consist of clay loam Illinoian till. Unless highly eroded, this subregion does not have many farming challenges.

With a median slope gradient of 3%, the possibility of erosion only increases with longer and steeper backslopes. The distribution of hillslope positions for this subregion is: Summit (typically flat): (20%) Shoulder (typically convex): (12%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (45%) Footslope (typically concave): (10%) Toeslope (typically flat): (14%)

Dominant Soil Series: Tama (12%), Lindley (8%), Fayette (7%), Clinton (7%)

The **Tama** series consists of very deep, well drained soils silty clay loam formed in loess. A frequently saturated zone does not occur within a depth of 6 feet during the wettest periods of years when precipitation is within one standard deviation of 30 year mean of annual precipitation. These soils are on higher ground between rivers and side slopes on uplands and on treads or level strips of land, and risers or steeper strips of land on stream terraces in river valleys. Slope ranges from 0 to 20 percent.

Dominant Land Uses: Row Crop (54%), Forest (18%), Urban (14%)

VEGETATION: Nearly level to gently sloping areas are cultivated. The principal crops are corn, soybeans, small grains, and legume hays. Steeper slopes are pastured. The native Vegetation is big bluestem, little bluestem, switchgrass, and other grasses of the tall grass prairie.

Grundy Center Rolling Plains – This is a stream and river crossed landscape with a branching drainage pattern formed during an early glaciation period. The area has an underlying, older, glacial limestone formation (Alburnett) with a younger one (Wolf Creek) on top. The landscape is capped by only up to 6.5 feet of silty clay loam loess and differs from all other rolling plains due to its proximity to the Iowan Erosion Surface with a lower average slope. Unless highly eroded, this subregion does not have many farming challenges.

This subregion is a bit of a transition area between the steeper rolling hills of the Southern Iowa Upland Flats and the Iowan Erosion Surface. With a 2% median slope gradient, its topography is similar to some areas of the Iowan Erosion Surface with relatively few significantly convex, concave or straight downhill areas as illustrated by the distribution of hillslope positions in the subregion: Summit (typically flat): (17%) Shoulder (typically convex): (17%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (23%) Footslope (typically concave): (23%) Toeslope (typically flat): (20%)

Dominant Soil Series: Dinsdale (22%), Tama (19%), Colo (14%), Muscatine (7%)

The **Dinsdale** series consists of very deep, moderately well drained silty clay loam soils that formed in 20 to 40 inches of loess and the underlying glacial till. Dinsdale soils are on higher ground between rivers, ridges and side slopes on dissected till plains. Saturation occurs within depths of 3.5 to 5.0 feet during April to June in normal years and both perched and apparent saturation can occur on this soil based on the season and intensity of rainfall during a given time. Surface runoff potential--low or medium. Slopes range from 0 to 14 percent.

The **Tama** series consists of very deep, well drained soils silty clay loam formed in loess. A frequently saturated zone does not occur within a depth of 6 feet during the wettest periods of years when precipitation is within one standard deviation of 30 year mean of annual precipitation. These soils are on higher ground between rivers and side slopes on uplands and on treads or level strips of land, and risers or steeper strips of land on stream terraces in river valleys. Slope ranges from 0 to 20 percent.

The **Colo** series consists of very deep, poorly drained silty clay loam soils formed in alluvium. These soils are on floodplains, low stream terraces, alluvial fans, and upland drainageways. These soils are frequently saturated at the soil surface during the wettest portions of normal years and is considered apparent. Surface runoff potential--negligible to low. Rarely flooded to frequently flooded for very brief to long periods during the months of February to November from precipitation events and snowmelt. Slopes range from 0 to 5 percent.

Dominant Land Uses: Row Crop (83%), Grassland/Pasture (7%), Urban (7%)

VEGETATION: Nearly level to gently sloping areas are cultivated. The principal crops are corn, soybeans, small grains, and legume hays. Steeper slopes are in permanent pasture. The native Vegetation is big bluestem, little bluestem, switchgrass, and other grasses of the tall grass prairie.

Iowan Erosion Surface – Although slopes may be similar in other subregions, they are longer from summit to toeslope in this area, which the word Erosion in the name is used to explain this feature rather than the erodibility of the surface. The area is a stream and river crossed plain with a branching drainage pattern, in an area with an underlying, older, glacial limestone formation (Alburnett) with a younger one (Wolf Creek) on top. The subregion has an underlying till from earlier glaciations that is capped by a sandier mixture of loess, leading it to drain more readily than soils in subregions to the west and south, with. Unless highly eroded, this subregion does not have many farming challenges.

With a 2% median slope gradient, its topography contains relatively few significantly convex, concave or straight downhill areas as illustrated by the distribution of hillslope positions in the subregion: Summit (typically flat): (22%) Shoulder (typically convex): (15%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (17%) Footslope (typically concave): (19%) Toeslope (typically flat): (27%)

Dominant Soil Series: Clyde (16%), Kenyon (11%), Floyd (6%), Readlyn (4%)

The **Clyde** series consists of very deep, poorly and very poorly drained silty clay loam soils formed in 30 to 60 inches of loamy glacial outwash or erosional sediments and the underlying loamy till. These soils are on nearly level positions, swales and concave drainageways on higher ground between rivers on dissected till plains. These soils are frequently saturated at the soil surface to a depth of one foot during the wettest periods portions of years when precipitation is within one standard deviation of the 30 year mean of annual precipitation, both perched and apparent saturation can occur on this soil based on precipitation frequency and intensity during a given time. Occasionally to frequently flooded for brief or very brief duration in drainageway positions. Slope ranges from 0 to 4 percent.

The **Kenyon** series consists of very deep, moderately well drained loam soils formed in 12 to 30 inches of silty or loamy sediments and the underlying till. These soils are on higher ground between rivers and side slopes on dissected till plains on the Iowan Erosion Surface. A frequently saturated zone occurs between depths of 1.0 and 6 feet during the wettest period of years when precipitation is within one standard deviation of the 30 year mean of annual precipitation, this saturation is considered both perched and apparent based on the season and intensity of rainfall during a given time. Slope ranges from 2 to 35 percent.

Dominant Land Uses: Row Crop (74%), Grassland/Pasture (12%), Developed (9%)

Vegetation: Where artificially drained, Clyde soils are cultivated. The principal crops are corn, soybeans, small grains, and legume hay. Where not artificially drained, Clyde soils are pastured. Kenyon areas are cultivated. The native Vegetation is big bluestem, western wheatgrass, sedges, blue grama and other species of the tall grass prairie that are tolerant of excessive wetness.

Maquoketa Rolling Plains – This subregion has slopes like those in the Paleozoic Plateau but with much deeper soils above bedrock. The landscape is crossed with streams and rivers with a branching drainage pattern from early glaciation, in an area that has an underlying, older, glacial limestone formation (Alburnett) with a younger one (Wolf Creek) on top. The landscape is capped by up to 65 feet of silt loam loess. It differs from the Tama Rolling Plains, because of increased sand content in the loess and thinner deposits of underlying till. With steeper slopes, this subregion has areas eroded close to bedrock which are the most challenging to farm. The loess is higher in sand content so will drain more readily than siltier soils in subregions to the west.

This subregion has a median slope gradient of 8% and a very high potential for significant erosion on steeper backslopes. The distribution of hillslope positions for this subregion is: Summit (typically flat): (5%) Shoulder (typically convex): (8%) Backslope (greatest potential for erosion with water speed able to increase on any straight part of the down slope): (71%) Footslope (typically concave): (9%) Toeslope (typically flat): (7%)

Dominant Soil Series: Fayette (38%), Downs (11%), Nordness (7%), Tama (4%)

The **Fayette** soil series consists of very deep, well drained soils formed in loess. These soils are on convex crests, higher ground between rivers and side slopes on uplands and on treads or level strips of land, and risers or steeper strips of land on high stream terraces. Saturation does not occur within a depth of 6 feet during the wettest periods of normal years. Surface runoff potential--negligible to high. Slope ranges from 0 to 60 percent.

The **Downs** soil series consists of very deep, well drained silt loam soils formed in loess. These soils are on higher ground between rivers and side slopes on uplands and on treads or level strips of land, and risers or steeper strips of land on stream terraces. Frequent saturation does not occur within a depth of 6 feet during the wettest periods of normal years. Surface runoff potential--negligible to high. Slopes range from 0 to 35 percent

Dominant Land Uses: Row Crop (51%), Grassland/Pasture (20%), Forest (19%)

VEGETATION: Nearly level to gently sloping areas are cultivated. The principal crops are corn, soybeans, small grains, and legume hays. Steeper slopes are pastured, wooded or both wooded and pastured. The native Vegetation is big bluestem, little bluestem, switchgrass, other grasses of the tall grass prairie and widely spaced oak and hickory trees.

Paleozoic Plateau – This part of Northeastern Iowa is characterized by shorter, steeper slopes and sedimentary bedrock capped by up to 33 feet of silt loam and loess from most recent glacial age, but thin till beneath. The bedrock-controlled landscape is strongly crisscrossed with branching drainage patterns, springs and disappearing streams, along with limestone and dolomite carbonate rocks forming caves, sinkholes and fissures in the topography. Isolated uplands contain remnants of Iowa's oldest till under the loess. The subregion is a rather challenging area to farm due to steeper slopes and areas with sinkholes and significant erosion that has left areas of shallow soil above the bedrock limiting productivity.

This subregion has a median slope gradient of 9% and a very high potential for significant erosion on steeper backslopes. The distribution of hillslope positions for this subregion is: Summit (typically flat): (4%) Shoulder (typically convex): (7%) Backslope (Backslopes have the greatest potential for erosion with water speed able to increase on any straight part of the down slope): (79%) Footslope (typically concave): (6%) Toeslope (typically flat): (4%) The large percentage of backslope in this region indicates high probability of erosion due to water being able to gather speed on a straight, downhill slope.

Dominant Soil Series: Fayette (35%), Downs (16%), Nordness (6%), Lacrescent (4%)

The **Fayette** and **Downs** soils consist of very deep, well drained silt loam soils formed in loess. **Fayette** soils are on convex crests (shoulders), higher ground between rivers and side slopes on uplands and on treads or level strips of land, and risers or steeper strips of land on high stream terraces. **Downs** are on higher ground in the same areas. Saturation does not occur within a depth of 6 feet during the wettest periods of normal years. Surface runoff potential--negligible to high. **Fayette** slopes range from 0 to 60 percent. **Downs** Slopes range from 0 to 35 percent.

Dominant Land Uses: Row Crop (36%), Forest (30%), Grassland/Pasture (27%)

VEGETATION: Nearly level to gently sloping areas are mostly cultivated. The principal crops are corn, soybeans, small grains, and legume hays. Steeper slopes are pastured, wooded or both wooded and pastured. The native **Fayette** Vegetation is deciduous trees, mainly oak and hickory. The native **Downs** Vegetation is big bluestem, little bluestem, switchgrass, other grasses of the tall grass prairie and widely spaced oak and hickory trees.