HIGH RESOLUTION STRATIGRAPHY OF LOWER MISSISSIPPIAN STRATA AT BRANSON NORTH, MISSOURI

By

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HIGH RESOLUTION STRATIGRAPHY OF LOWER MISSISSIPPIAN STRATA AT BRANSON NORTH, MISSOURI

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CHAPTER I

Introduction

The Mississippian rocks are of great interest because recent hydrocarbon discoveries in the mid-continent region of Kansas and northern Oklahoma. Further understanding of the surface and subsurface rocks is necessary to develop a reliable sequence stratigraphic model for the Mississippian. This paper presents detailed stratigraphic analysis of the Lower Mississippian rocks that outcrop at the intersection of Hwy 465 and Hwy 248 Branson north, Missouri. The 44.1 m (144.6 ft) long section exposed at Branson north, is a good site because it exposes a uniquely complete section from the Bachelor Formation through the Reeds Spring Formation. No long sections in that region of the outcrop belt has been detailed tying the carbonate petrography and biostratigraphy.

Objectives

The primary objective of this study is characterization of the lithological history of the Lower Mississippian units found in the study area. Previous studies have not included a bed by bed depositional history or provided a detailed textural composition of Lower Mississippian rocks in southwestern Missouri. Subsequently, there has been no detailed analysis by which to establish a reliable sequence stratigraphic framework. Detailed descriptions focusing on the change of rock texture, using detailed stratigraphic and petrographic examination will be used to determine the sea level fluctuation history and thereby provide a basis to establish a sequence stratigraphic model. A comparison with the Lower Mississippian rocks at Jane, Missouri will further provide a framework as to the depositional history of these units.

Previous Studies

The stratigraphic succession of southwestern Missouri is well documented by Thompson (1969) and Thompson and Fellows (1970) yet not much is known about the depositional history of the strata. Thompson and Fellows (1970) published a comprehensive and detailed study on the Lower Mississippian strata in southwestern Missouri and the adjacent areas with the focus being developing a broad stratigraphic relationship and conodont biostratigraphy.

Lane and De Keyser (1980) constructed a paleogeographic map for the mid-continent region using the same faunal criteria used in Lane (1978). Lane (1978) recognized four distinct facies using conodonts which were later used in Lane and De Keyser (1980) as magnafacies to study the areal distribution which was determined to be nearly identical to depostional facies in the European Carboniferous (Carboniferous Limestone/Kohlenkalk and Culm facies) where a long-standing onshelf-offshelf model of deposition has been repeatedly tested. Much of the model produced by Lane (1978) and Lane and De Keyser (1980) is based on the numerous sections of Thompson and Fellows (1970).

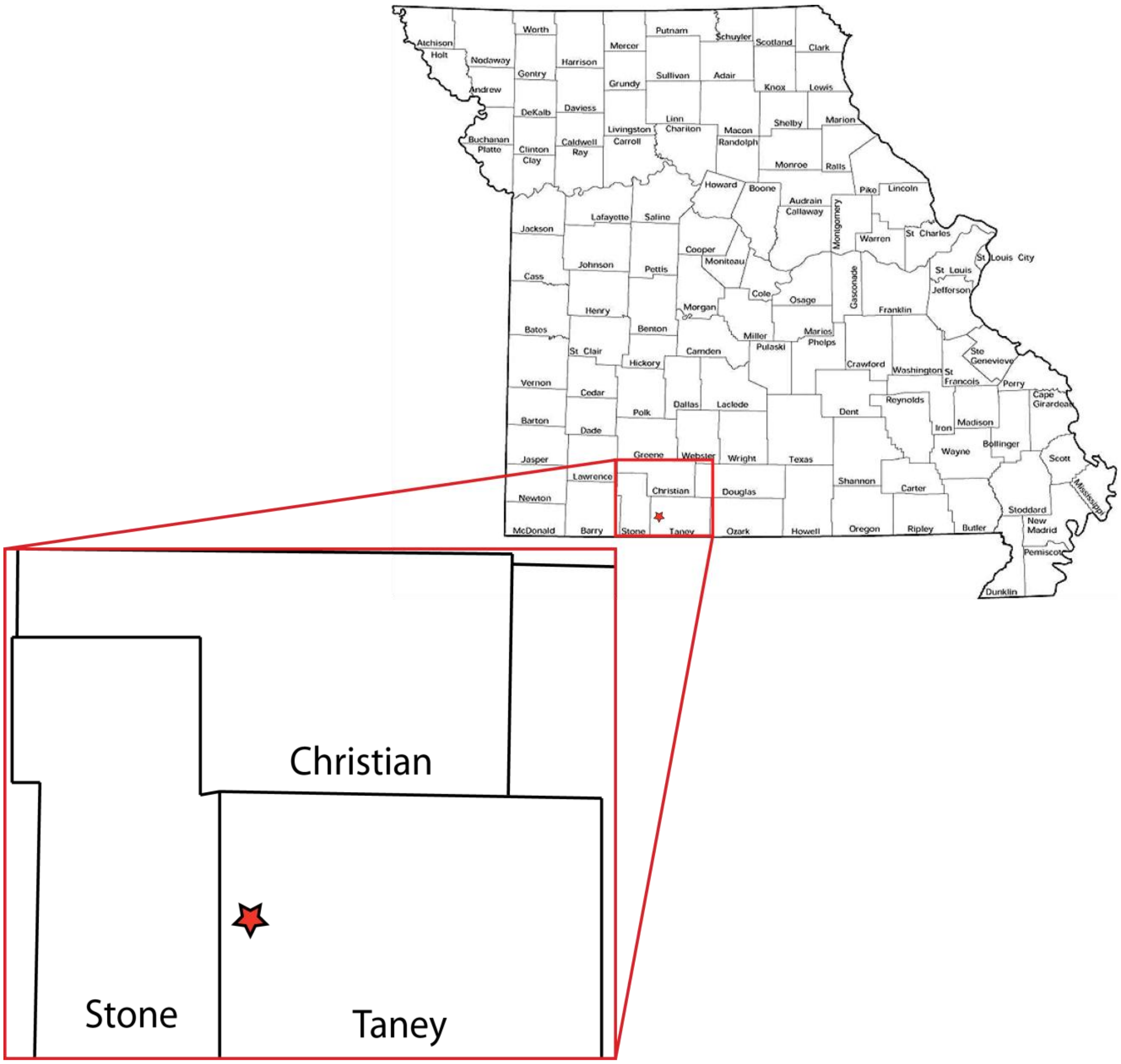

Figure 1.1. Study area located north of Branson, Missouri at the intersection of Hwy 465 and Hwy 248.

CHAPTER II

Geologic Framework

The Branson north outcrop is located on the southwestern edge of the Ozark Uplift and north of the Ouachita Trough. The rock units in this study were deposited near the contact of the Burlington Shelf margin and the main shelf during the late early Mississippian according to Lane and De Keyser (1980). The sediments were deposited in the Mississippian Valley Graben syndepositionally with tectonic activity in the Ouachita Fold Belt region (Thomas 2004). This area was characterized as a shallow marine carbonate shelf (Viele and Thomas 1989).

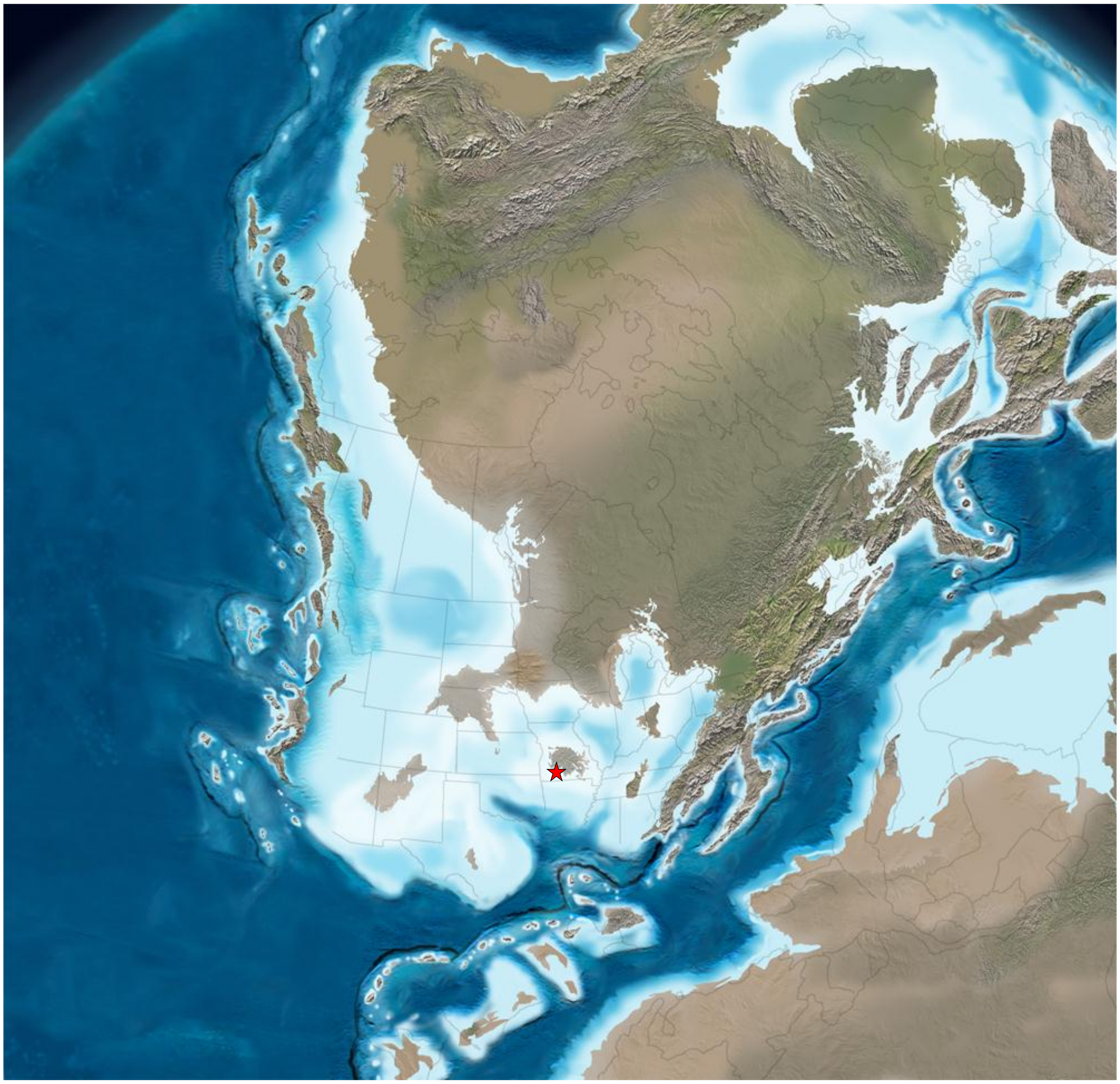

Figure 2.1. Paleogeographic map of the early Mississippian (Blakey, 2011). Red star shows approximate location of the Branson north outcrop.

Depositional History and Stratigraphic Distribution

The Lower Mississippian rock units in this study were deposited during the Kinderhookian and the Osagean Stages. In most areas in southwestern Missouri, the units are underlain by Devonian Woodford Shale. In other areas, such as this study location, they are underlain unconformably by the Lower Ordovician Cotter Dolomite.

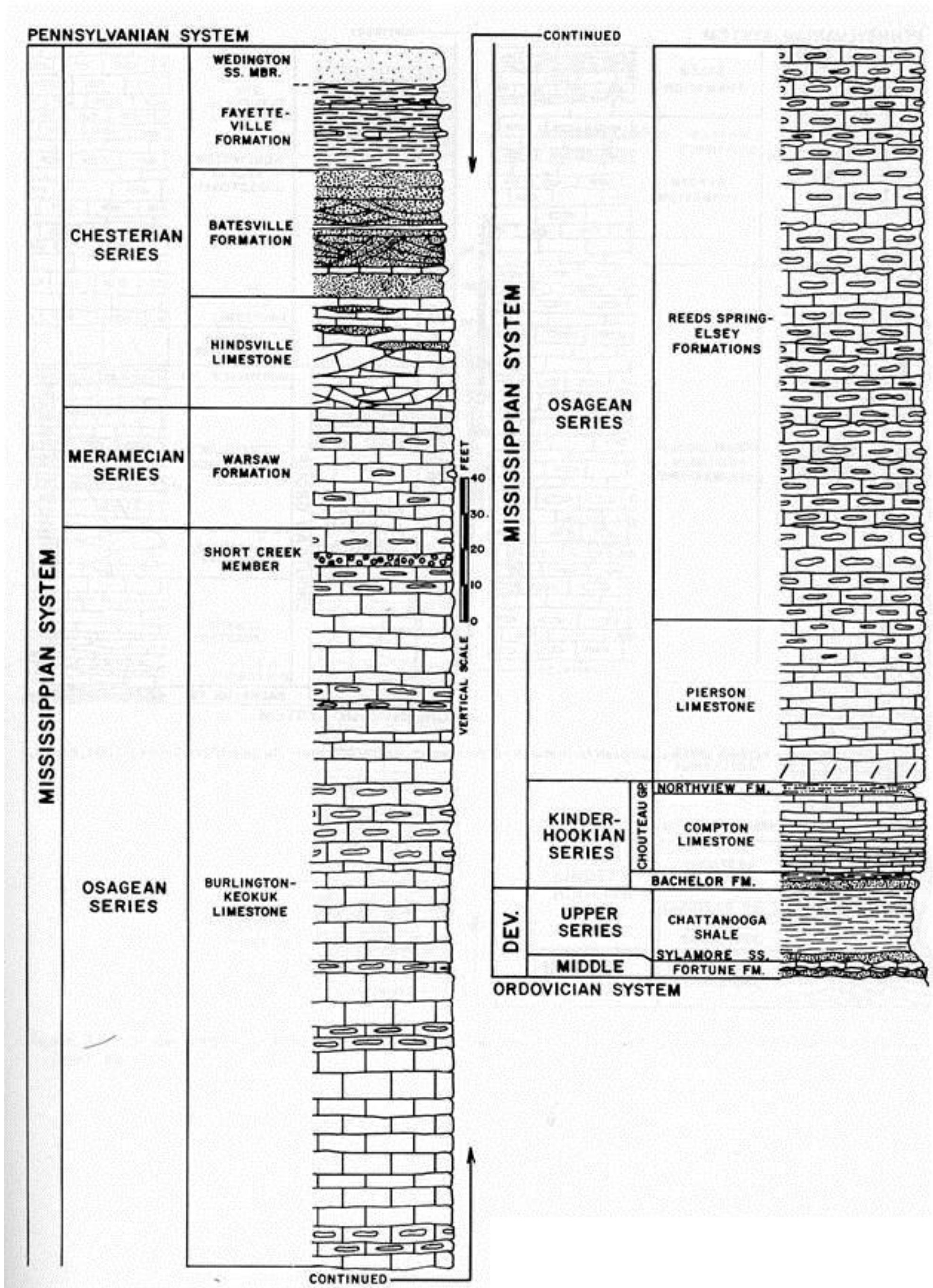

Figure 2.2. Typical stratigraphic nomenclature for Lower Mississippian rocks of southwestern Missouri. Adapted from (Spreng 1961, fig 13).

Bachelor Formation

Original description - "The lithology of the Bachelor Formation, is markedly varied although it consists dominantly of pale buff quartz sandstone of medium grain size, moderately well to poorly sorted" (Mehl, 1960, p. 95). The basal part of the Bachelor Formation has an abundance of spherical, flattened, irregular and elongate phosphatic nodules measuring up to several inches in diameter. Thompson and Fellows (1970) amended Mehl's original description to include a two-part Bachelor Formation in southwestern Missouri which included a lower sandstone and upper thin shale. Moving southward and southwestward the sandstone thins and disappears leaving only a single shale bed. Thompson (1975) studied and described the Bachelor formation of southeastern Missouri as comprising only the lower sandstone with the limestone of the Fern Glen Formation lying above it.

Type section – Mehl (1960, p.94) defined the type section of the Bachelor as an exposure in a streambed in the SE ¼ NW ¼ SW ¼ sec. 9, T. 48 N., R. 8 W., Callaway County, Missouri, Calwood 7 ½' Quadrangle.

Reference sections – Thompson (1986) identifies four reference sections are located around the state of Missouri to illustrate the nature of the Bachelor Formation due to the poor nature of the type section. Everywhere except extreme southwestern, east-central, and southeastern parts of Missouri the Bachelor Formation comprises a lower sandstone and an upper shale. The best example of the two-part Bachelor formation (fig.3.1) is found in the quarry at Baird Mountain, Taney County, Missouri (SW¼ N¼ sec. 26, T. 22 N., R. 22 W., Table Rock Dam 7½' Quadrangle). This section most closely resembles the study area.

A second outcrop of the Bachelor Formation is described lying on the Late Devonian Sylamore Sandstone at a section on the Missouri-Arkansas border in northern Boone County, northwestern Arkansas (NW¼ NE¼ sec. 9, T. 21 N., R. 21 W., Omaha 7½' Quadrangle), (Thompson and Fellows 1970, p. 188-189).

A third outcrop of the Bachelor Formation exposes the lower shale between Lower Ordovician dolomite and the overlying Compton Limestone at a roadcut on Missouri Highway 86 in southern Stone County, Missouri (center S½ NW¼ NW¼sec. 24, T. 21 N., R. 24 W., Lampe 7½' Quadrangle).

The fourth outcrop is a roadcut on Missouri Highway 30 exposes only the Bachelor Sandstone which is typical of the Bachelor Formation in eastern and southeastern Missouri. This outcrop is located near House Springs, Missouri (SE¼ SE¼ NE¼ sec. 33, T. 43 N., R. 4 E., House Springs 7½' Quadrangle, Jefferson County, Missouri) (Collinson et al., 1979, p. 99; Thompson, (1986)).

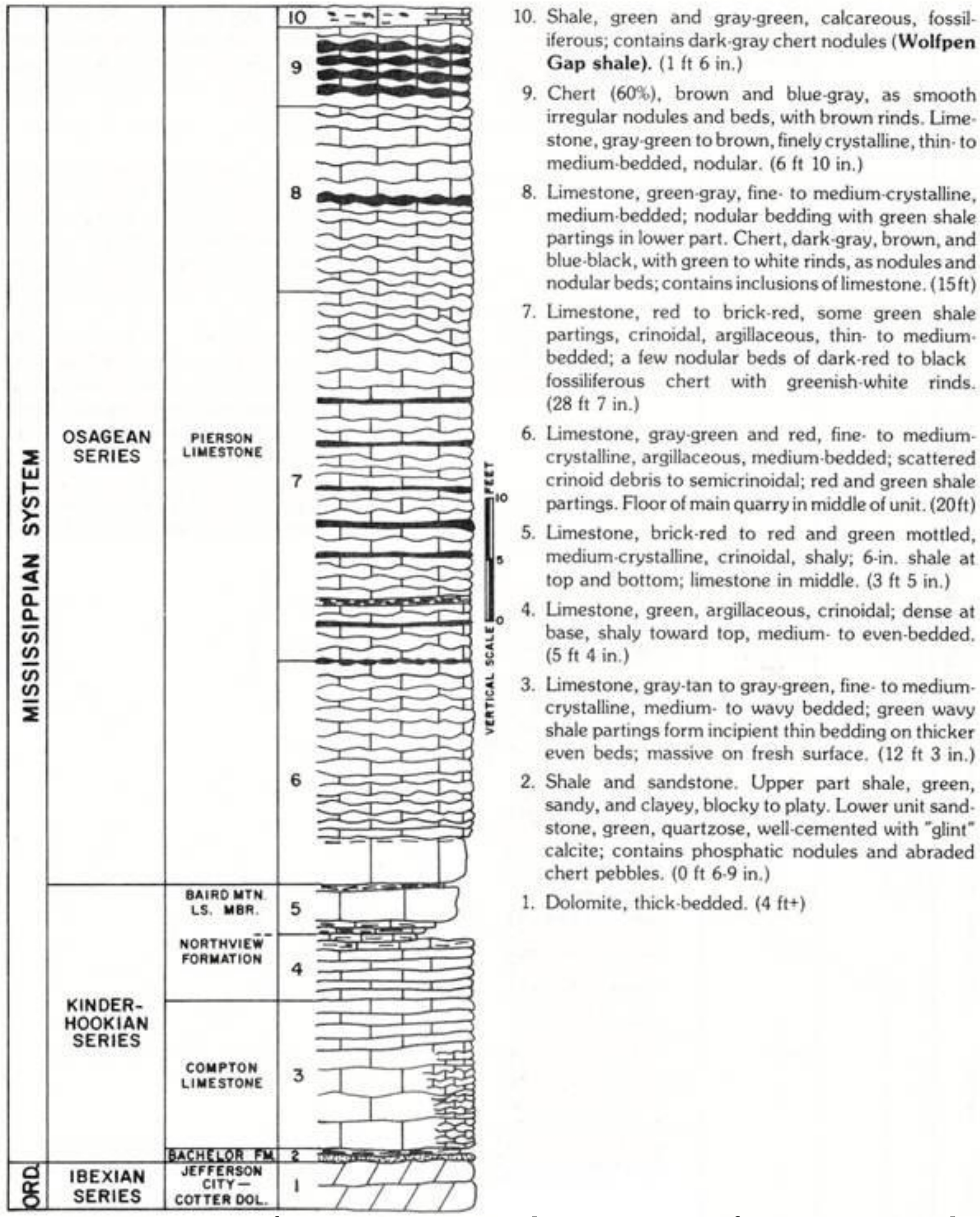

Figure 2.3. Primary reference section is a columnar section of exposure in Baird Mountain Quarry. SW¼ NW¼ sec. 26. T. 22 N .• R. 22 W ., Table Rock Dam 7½' Quadrangle. Taney County. southwestern Missouri. (Thompson (1986) adapted from (Thompson and Fellows 1970. sec. B. p. 149-155).

Compton Limestone

Original description - (Moore, 1928, p. 120) "The Compton Limestone is a light bluish drab or grayish blue, compact limestone, very fine-grained and breaking with a conchoidal fracture. . . . . The beds are generally of moderate thickness, averaging 15-20 centimeters (6 - 8 inches), but in places they are of as much as 0.6 meters (2 feet) thick. The upper beds merge into the soft bluish shale of the Northview Formation. As observed on Finley Creek, the rock is very compact, hard, fine-grained, breaking with a splintery, conchoidal fracture."

Type section – Moore (1928, p. 118) originally described a section measured by Weller at Bridwell's Hill (sec. 3, T. 29 N., R. 19 W.), on James River near Compton, Missouri to represent the Compton Formation. The name was derived from the former post office in Webster County.

Beveridge and Clark (1952, p. 73) stated, "The original type area is along the James River in the vicinity of the now non-existent Compton post office which stood in the NW/ 4 NW/ 4 SE/ 4 sec. 8, T. 29 N., R. 19 W., Webster County.

The Compton Limestone is not exposed in the immediate vicinity of the post office site and so the type section was designated by Beveridge and Clark (1952, p.73) at SE¼ NE¼ SE½ sec. 3, T. 29 N., R. 19 W., on the northwest side of a gravel road, Webster County, Missouri. This section shows the Compton Limestone in its entirety and is located two miles northeast of the Compton post office site."

Because section 3 is almost 3.22 km (2 mi) long north-south, Thompson and Fellows (1970, p. 14) indicated the site as "SE¼ E½ E½ Lot 2 of the NE1/4 sec. 3..." Fordland 7½' Quadrangle (fig. 32). No type section currently exists for the Compton

Limestone because this exposure has been nearly completely buried during the gravel road relocation to the above outcrop.

Reference sections – The type section no longer exists so two reference sections established by Thompson and Fellows (1970) can be used to determine the characteristics of the Compton Limestone. One reference section is located on U.S. Highway 65 south of Springfield, in Christian County, Missouri (fig.3.2) (SW ¼ SW ¼ NE ¼ sec. 22, T. 25 N., R. 21 W., *Day 7 ½' Quadrangle*) (Thompson and Fellows, 1970, section M, p. 180; fig. 33). This reference section most closely resembles the Compton in the study area. The other reference section located on I-44 is a roadcut exposure located just east of Mt. Vernon, Lawerence County, Missouri (NW ¼ NE ¼ SE ¼ sec. 7, T. 28 N., R. 25 W., Halltown 7 ½' Quadrangle) (Thompson and Fellows, 1970, section J, p. 170-172).

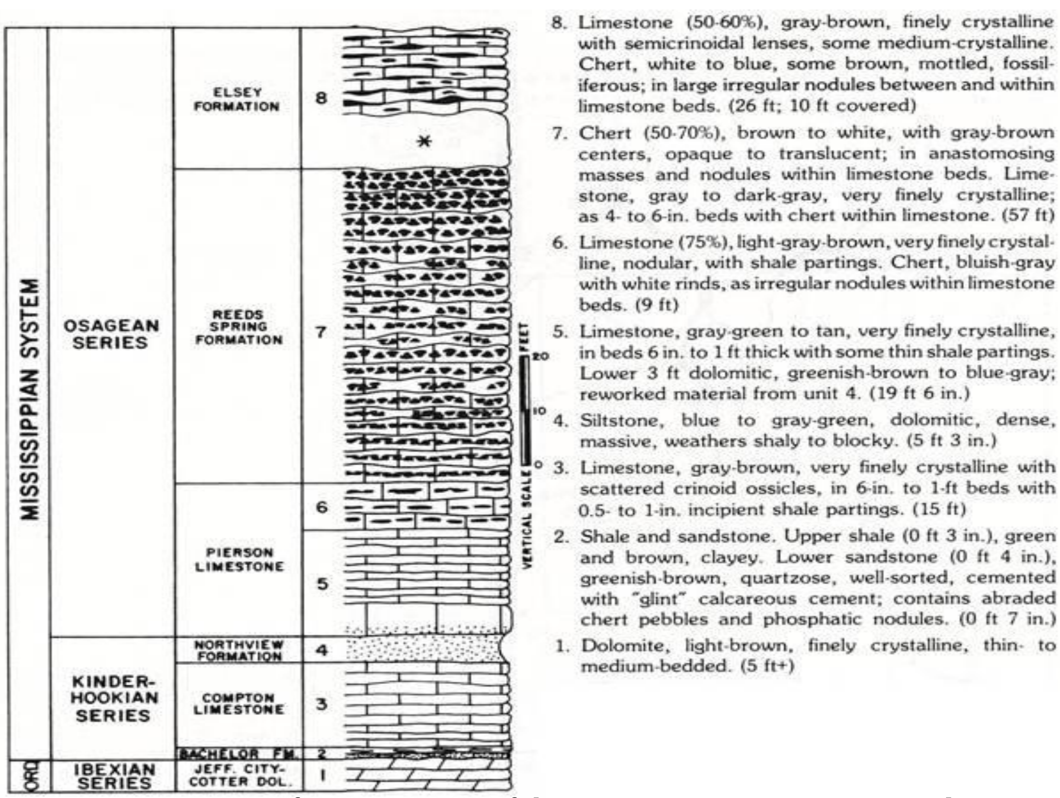

Figure 2.4. Primary reference section of the Compton Limestone. Located at a roadcut on U.S. Highway 65 south of Springfield, SW ¼ SW ¼ NE ¼ sec. 22, T. 25N, R. 21 W., Day 7 ½ 'Quadrangle, Christian County, Missouri. (Thompson 1986 P.42) adapted from Thompson and Fellows (1970. Sec, M, P. 180-184)

Northview Formation

<u>Original description</u> - (Weller, 1901, p. 140) "In the older geological reports these beds have been known as the Vermicular sandstone and shales from the abundance of worm burrows which occur in the sandstones."

The name Northview was derived from the fossiliferous sandstones located near Northview, in the western edge of Webster Coutny.

Shephard's investigations show the Northview Formation ranging in thickness from 3.05-27.43 m (10-90 ft). Typically the Northview Formation comprises two members, a lower bluish shale and an upper fine-grained yellowish sandstone. These two members of the Northview Formation have a gradational contact with no sharp contact or line of separation being present. One member, normally the lower shale, is frequently thickened at the expense of the other member.

<u>Type section</u> – The Northview Formation was originally named by Weller (1901) from multiple exposures near Northview, Webster County, Missouri. Two sections were used to make one composite type section by Beveridge and Clark (1952, p. 74). One section, the lower part, is located at SW¼ SW¼ SW¼ sec. 23, T. 30 N., R. 19 W., on what was supposed to be the south (eastbound) lane of U.S. Highway 66 (now Webster County road B). The upper part of the Northview Formation is exposed on the eastbound lane of I-44, in NE¼ SE¼ SE¼ sec. 22, T. 30 N., R. 19 W., Strafford 7½' and Marshfield 7½' Quadrangles. Thompson and Fellows (1970, p. 17) reported new construction on I-44 which completely destroyed the upper part of this type section.

Reference sections –The principle reference section for the Northview Formation is exposed at King Butte, Greene County, Missouri (fig. 3.3). This section is approximately 24 km (15 mi) northwest of the original type section and exposes almost 18.25 m (60 ft) of the Northview Formation. This section is located in the SE¼NE¼ NE¼sec. 27, T. 31 N., R. 22 W., Pleasant Hope 7½' Quadrangle, and was described by Clark and Beveridge (1952, p. 39).

The roadcut on Missouri Highway 123, southwest of Aldrich, Polk County, Missouri is another excellent complete exposure of the Northview Formation in the "Northview basin". The exact location is NE¼ SE¼ NE¼ sec.4, T. 32 N., R. 24 W., Aldrich 7½' Quadrangle.

Two other sections illustrating the Northview as a dolomitic siltstone or silty dolomite are present. The section most closely resembling the study area is a roadcut on U.S. Highway 65 in Christian County, Missouri (fig. 3.2); SW¼ SW¼ NE¼ and NW¼ NW¼ SE¼ sec. 22, T. 25 N., R. 21 W., Day 7½' Quadrangle (Thompson and Fellows, 1970, section M, p. 180). The other section containing approximately 1.82 meters (6 feet) of silty dolomite, is a roadcut on 1-44, near Mt. Vernon, Lawrence County, Missouri, NW¼ NE¼ SE¼ sec. 7, T. 28 N., R. 25 W., Halltown 7½ Quadrangle (Thompson and Fellows, 1970, section J, p. 170).

The Northview Formation is described as an argillaceous limestone in a section located in a in Lanagan, McDonald County, Missouri, on the east side of County Road EE , NW¼ SE¼ NE¼ sec. 36, T. 22 N., R. 33 W., Noel 7½' Quadrangle (Thompson and Fellows, 1970, section K, p. 173- 176). A section similar to the Lanagan section is in Baird Mountain Quarry, near Table Rock Dam, Taney County, Missouri, SW¼ NW¼ sec. 26, T. 22 N., R. 22 W., Table Rock Dam 7½' Quadrangle (Thompson and Fellows, 1970, section B, p. 153).

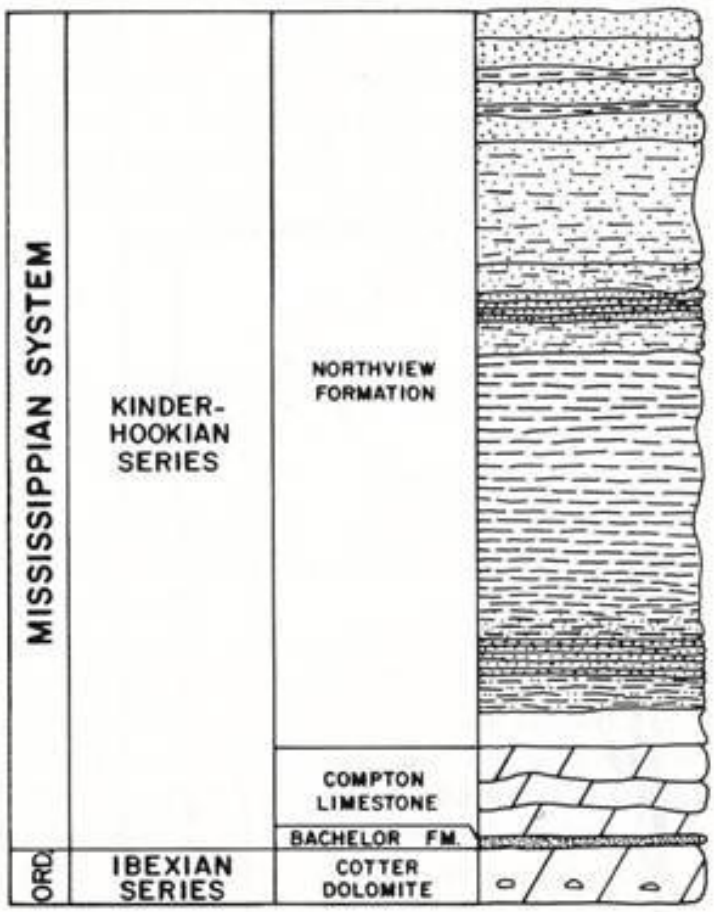

Figure 2.5. Columnar section of Northview Formation exposed at King Butte, SE¼. NE¼. NE¼. sec. 27, T. 31 N. R. 22 w., Pleasant Hope 7 ½' Quadrangle, Greene County, Missouri. This is designated a Principal Reference Section for the Northview Formation. Thompson (1986 P.54) adapted from Clark and Beveridge (1952, fig. 13).

Pierson Limestone

Original description - (Weller, 1901, p. 144) *"Pierson limestone* - This is a fine-grained buff colored, gritty limestone having a maximum thickness, according to Shepard, of 9.1 m (30 ft), being the formation designated by him as the Chouteau limestone."

Type section – The Pierson Limestone was described as well exposed along Pierson Creek [actually spelled Pearson Creek] near the zinc mines Weller (1901). The cut on the north side of County Road 0 in the NE¼ SW¼ SW¼ sec. 29, T. 29 N., R. 20 W., near Turner Station, in Greene County was designated the type section by Beveridge and Clark (1952, p. 76). Described by Robertson (1967, p. 54-57) and Thompson and Fellows (1970, p. 147), this section is east of the bridge over James River, Galloway 7½' Quadrangle (Fig. 3.4). The upper Pierson and overlying Elsey have more exposure than previously described because of reconstruction to Road 0. The new road was moved slightly north of the old road locating the original type section on the blacktop paralleling Road 0.

Reference sections – The Pierson Limestone at its type section is more dolomitic than the Pierson Limestone characteristically found in the region so it is suggested that other sections of Pierson strata be studied to determine characteristics. A good example of the Pierson Limestone is a roadcut on 1-44, near Mt. Vernon, NW¼ NE¼ SE¼ sec. 7, T. 28 N., R. 25 W., Halltown 7½' Quadrangle, Lawrence County, Missouri (Thompson and Fellows, 1970, section J, p. 170-172).

The best representative section for the Pierson Limestone in the study area is a roadcut on U.S. Highway 65, NW¼ NW¼ SE¼ sec. 22, T. 25 N., R. 21 W., Day 7½’ Quadrangle, Christian County, Missouri (fig. 3.2).

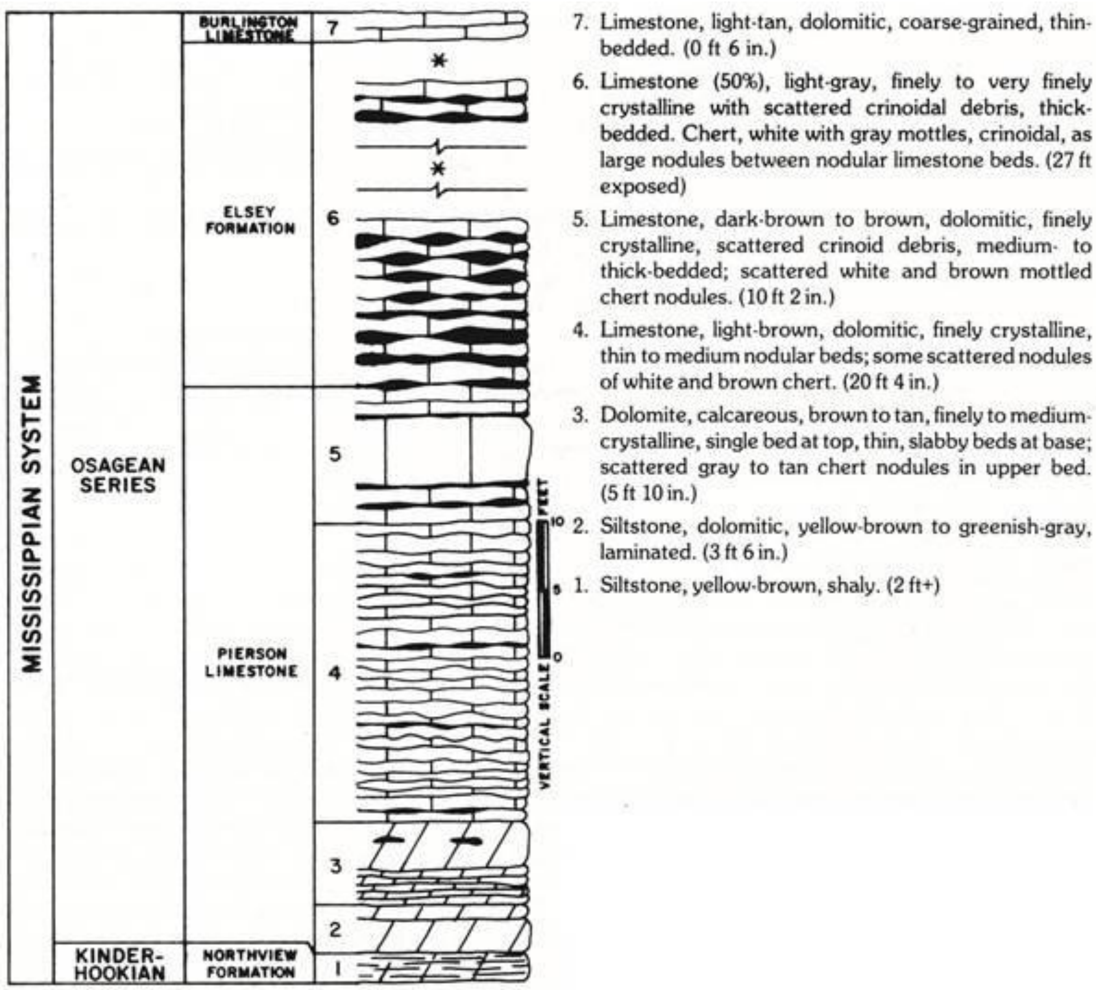

Figure 2.6. Columnar section of the type section of the Pierson Limestone exposed in roadcut near Turner station on old Highway D, 0.1 mile northeast of Turner store, NW ¼ SW ¼ SW ¼ sec. 29, T. 29. N., R. 20 W., Galloway 7 ½ ‘ Quadrangle, Greene County, southwestern Missouri. (Thompson (1986) adapted from (Thompson and Fellows 1970, sec. A, p. 146-148)).

Reeds Spring Formation

Original description - (Moore, 1928, p. 163) ". . . interstratified dense, dark blue limestone and dark chert . . . is characteristic of the Reeds Spring Limestone member of the Boone in southwestern Missouri."

Type section – Moore (1928) named the Reeds Spring Formation from exposures near Reeds Spring, Stone County, Missouri. The type section is located along the Missouri-Pacific Railroad south of the town, N½ NW¼ SW¼ sec. 31, T. 24 N., R. 22 W., Garber 7 ½' Quadrangle (Fig. 3.5). This type section was described by Thompson and Fellows (1970, section D, p. 161-163).

Reference section – An excellent exposure, that is more accessible than the type section of the Reeds Spring, is in a roadcut on U.S. Highway 65, 0.8 km (0.5 mi) north of the junction with Christian County Road BB (fig. 2), SW¼ SW¼ NE¼ and NW¼ NW¼ SE¼ sec. 22, T. 25 N., R. 21 W., Day 7 1/2' Quadrangle. Thompson and Fellows (1970, section M, p. 180) were responsible for describing this section.

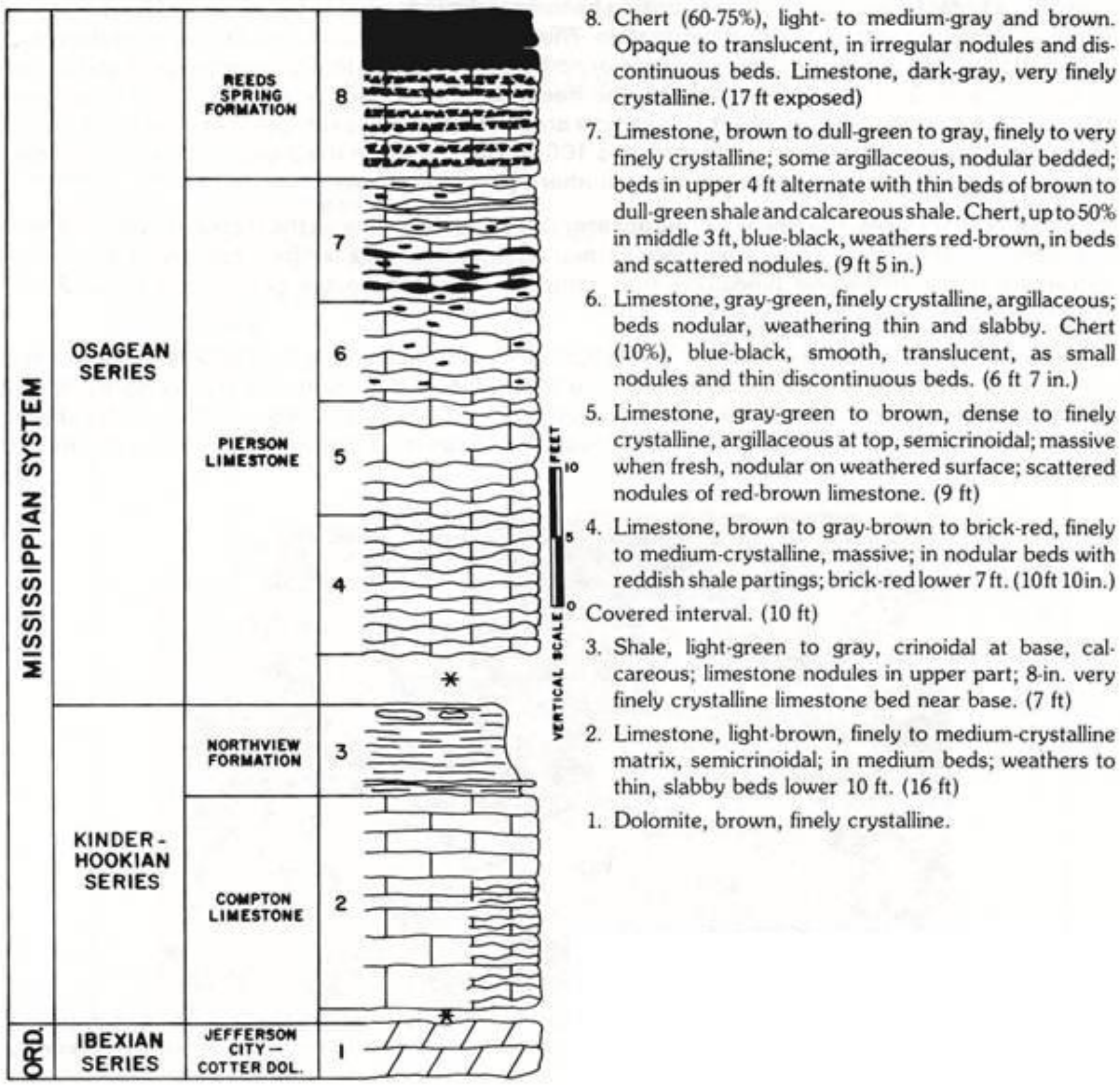

Figure 2.7. Columnar section of the type section of the Reeds Spring Formation, in a railroad cut south of the tunnel at Reeds Spring, N½ NW¼ SW¼ sec. 31, T. 24 N., R. 22 W., Garber 7 ½' Quadrangle., Stone County, southwestern Missouri. (Thompson 1986) adapted from (Thompson and Fellows 1970, sec. D, p. 161-163).

CHAPTER III

Methodology

Field Methods:

The Branson north outcrop, located at the intersection of Hwy 248 and Hwy 465, was measured with measuring tape. The process began with finding the bottom of the section (which is the Bachelor Formation) and breaking each subsequent unit into bedsets. Bedsets were determined by lithologic breaks in the rock. Major breaks were classified as bedsets first and then the smaller breaks were determined to be beds within the set. Each bed from the Bachelor Formation through the Reed Springs Formation was measured to within .64 cm (.25 in) to accurately represent the actual outcrop. Samples were taken from each limestone bed for later microscope and conodont study.

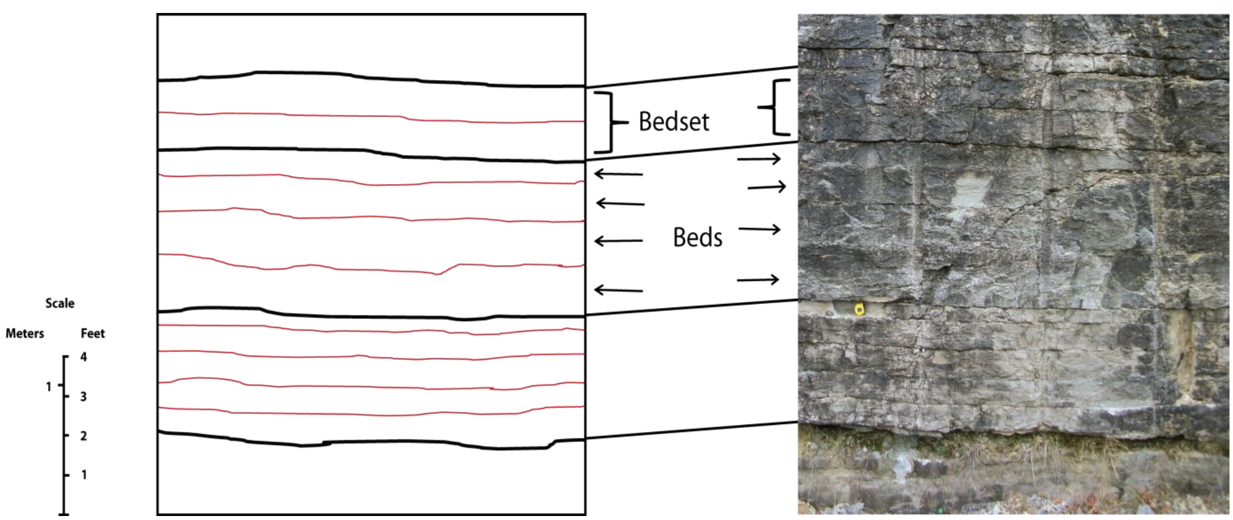

Figure 3.1. Example of the divisions of the rocks into beds and bedsets based on significance of breaks. Bedsets represent significant breaks in the outcrop that could be seen at a distance. These were subdivided into small bed units based on closer examination.

Lab Methods:

Acetate peels:

Sixty-seven samples averaging 1 to 2 kg were selected to make acetate peels. The materials and tools for making acetate peels are a rock saw, 120, 240, and 600-grit silicon carbide powder, 10% dilute hydrochloric acid, acetone, plastic acetate sheets and oversized thin section glass.

Each sample was cut into approximately a 5.08 cm by 10.16 cm (2 in by 6 in) or a 10.16 cm by 7.62 cm (4 in by 3 in) rectangle when possible for maximum surface exposure. This size allows for two oversized thin sections. One was stored away in case the selected one did not accurately represent the rock or was lost. Rough surfaces were first polished with 120 grit to remove saw marks. A 200 grit was then used to make a smooth surface and finally 600 grit was used to complete the process until the rock had a nice sheen. Once polishing was complete each sample's polished side was held in 10% hydrochloric acid (HCL) for 10 seconds. Samples were removed at the end of the 10 seconds and rinsed in water until all acid was removed. Samples were covered with a film of acetone. A pre-cut acetate sheet was then pressed onto the surface of the rock while it was still covered with acetone. Acetate sheets were rolled on from one edge to the opposite edge of the rock to help remove any excess acetone and to ensure the acetate paper was flush with the polished surface. After drying for 20 minutes the acetate sheet was gently peeled away to avoid ripping. The peel was then cut to fit between two 5.08 cm by 7.62cm (2 in by 3 in) oversized thin section slides that were taped together at the top edge. Finally the samples were labeled and set aside for petrographic examination.

Description:

Each acetate peel was described based on overall texture, fossil identification, cements, and diagenesis by using a Leica DM EP polarizing microscope and a Color Guide to the Petrography of Carbonate Rocks book (Sholle et.al 2006). Photographs were then taken of each acetate peel using an Olympus BX 51 Microscope.

Conodont Recovery:

There were 104 samples taken for conodont recovery. All samples were broken with a 1.36 kg (3 lb) sledgehammer to approximately 2cm^3 (.79 in^3) pieces. Each sample was measured on a triple balance to 2 kgs (4.4 lbs), and was divided into 2 buckets containing 1 kg (2.2 lb) each. The samples were then acidized overnight in 10% formic acid solution for a minimum of 24 hours. At the end of the 24 hours samples were wet sieved in mesh sizes of 30 (.59mm) and 100(.149mm) to recover the non-calcareous residue. The residue left in the small mesh (.149mm) was collected and dried in an oven. After the sediment was dry it was soaked in kerosene for 4 hours to separate the clay from the rest of the sediment. The samples were then sieved and dried again. After the second drying the samples were put into envelopes and labeled for conodont identification.

CHAPTER IV

Location

The Lower Mississippian rocks are well exposed at the intersection of Hwy 248 and Hwy 465 and all the rock units in this study can be found at this one outcrop in succession. This outcrop was selected to do a detailed stratigraphic and petrographic analysis because it is a complete section that is conformable. The outcrop is approximately at 36° 42' 50.21" N Latitude 93° 16'04.83" W Longitude, at the intersection of Hwy 465 and Hwy 248 8.8 km (5.5 mi) northwest of Branson in Taney County, southwest Missouri. The units included in the study in ascending order are the Bachelor Formation, Compton Limestone, Northview Formation, Pierson Limestone, and Reeds Spring Formation.

The Bachelor Formation consists of two parts at this locality; a lower marine sandstone and an upper shale member. The shale is unconsolidated green clay continuing abundant quart clastics which continues through the bottom of the Compton Limestone. The Compton Limestone is comprised of 9 bedsets with textures shifting between packstone and mudstone-wackestone throughout the formation. Dolomite does become present in small amounts within the Compton Limestone. Siliciclastics become present at the end of the Compton Limestone transitioning into the Northview Formation. The Northview Formation contains 2 bedsets with a total of 6 beds of mudstone-wackestone and wackestone-mudstone. The rocks in the Northview Formation are dolomitic and contain abundant siliclastics in all the beds. Two shales are also present within this formation but were collected for later lab work. The Pierson Limestone is a transitional contact with the Northview Formation and contains siliclastics through bed P4A which are largely present in the Northview Formation. The bottom Pierson Limestone is dolomitic but the dolomite content decreases significantly after bed P4B and is only present in small amounts. Textures in the Pierson Limestone fluctuate dominantly between wackestone-packstone to wackestone-mudstone. Starting in Pierson 15 the mudstone-wackestone texture reveals a deepening transition into the Reeds Spring Formation. Pierson 15 D contains abundant chert nodules that also suggest a transitional contact into the Reeds Spring which is known to contain abundant chert. Figure 4.5 shows the lithology of the entire Branson north section that underwent microscope work. Five depositional cycles have been picked out and the boundaries are represented by horizontal black lines found on the texture representation of the Stratigraphic column. Each beds texture has been placed to the right of the lithology section of the Stratigraphic column and is connected by a dark black line to help aid in the identification of cycles.

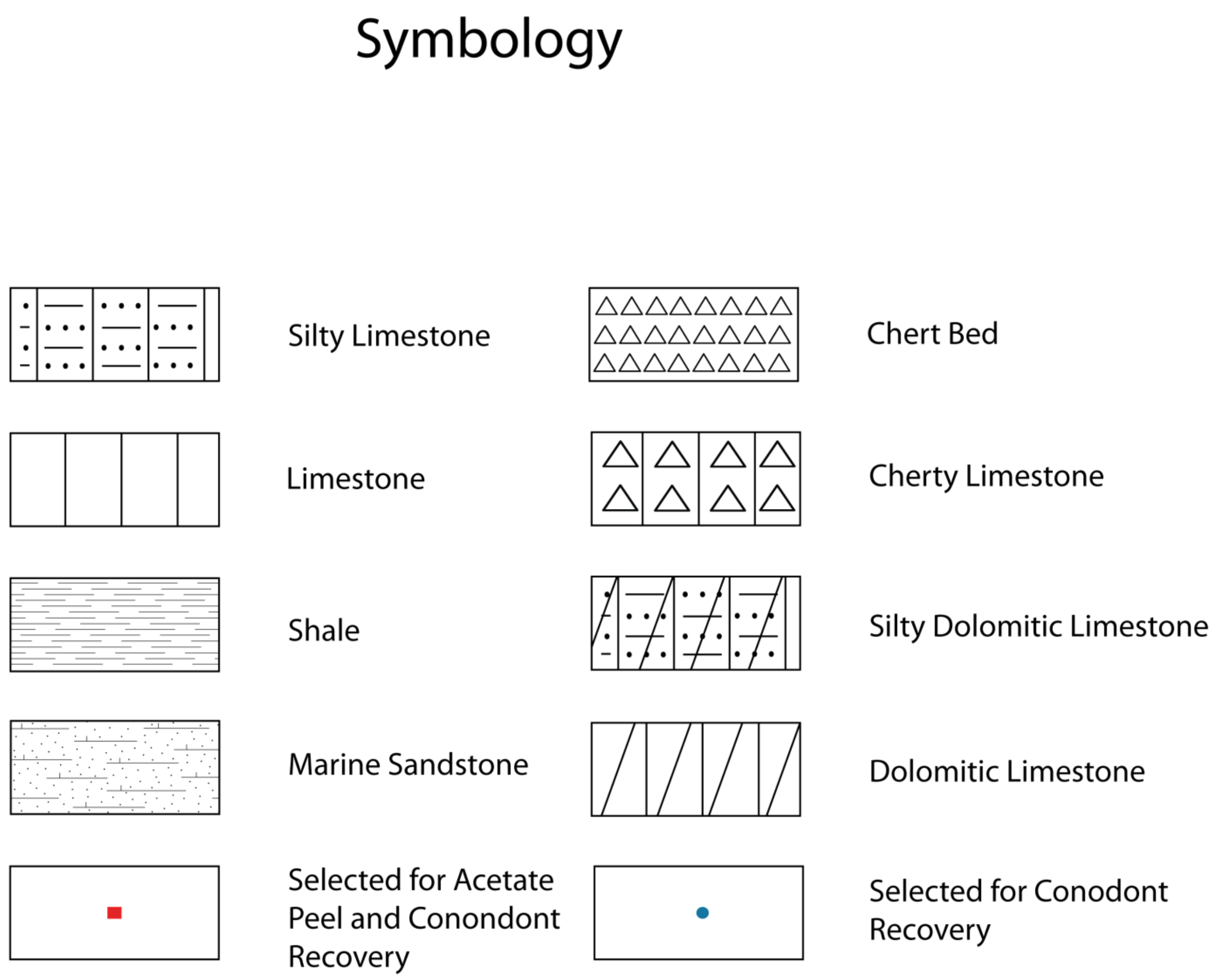

Figure 4.1. Symbology for figures 4.1, 4.2, and 4.3.

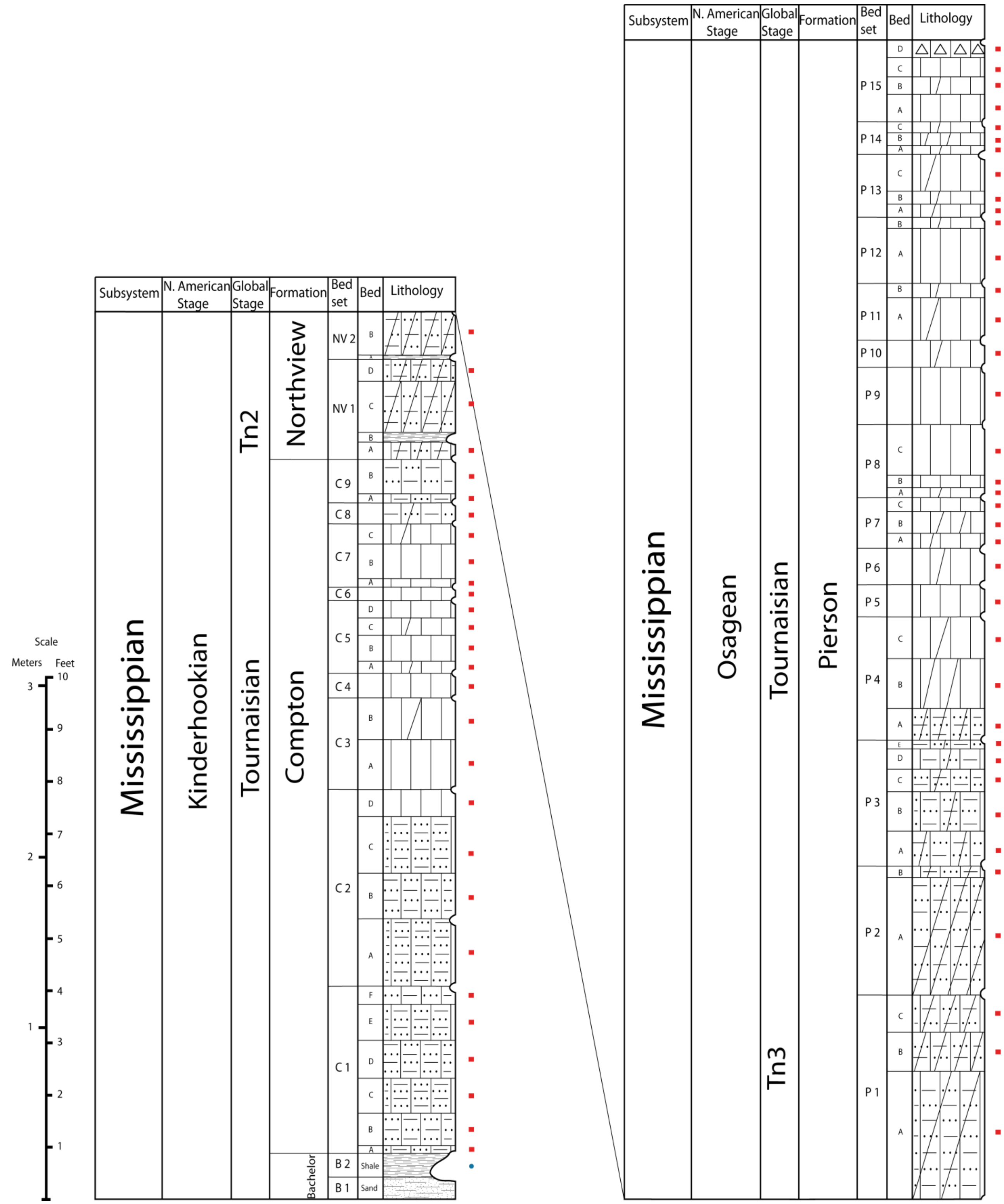

Figure 4.2. Stratigraphic column of the Bachelor Formation, Compton Limestone, Northview Formation, and Pierson Limestone showing bedsets, beds, and lithology.

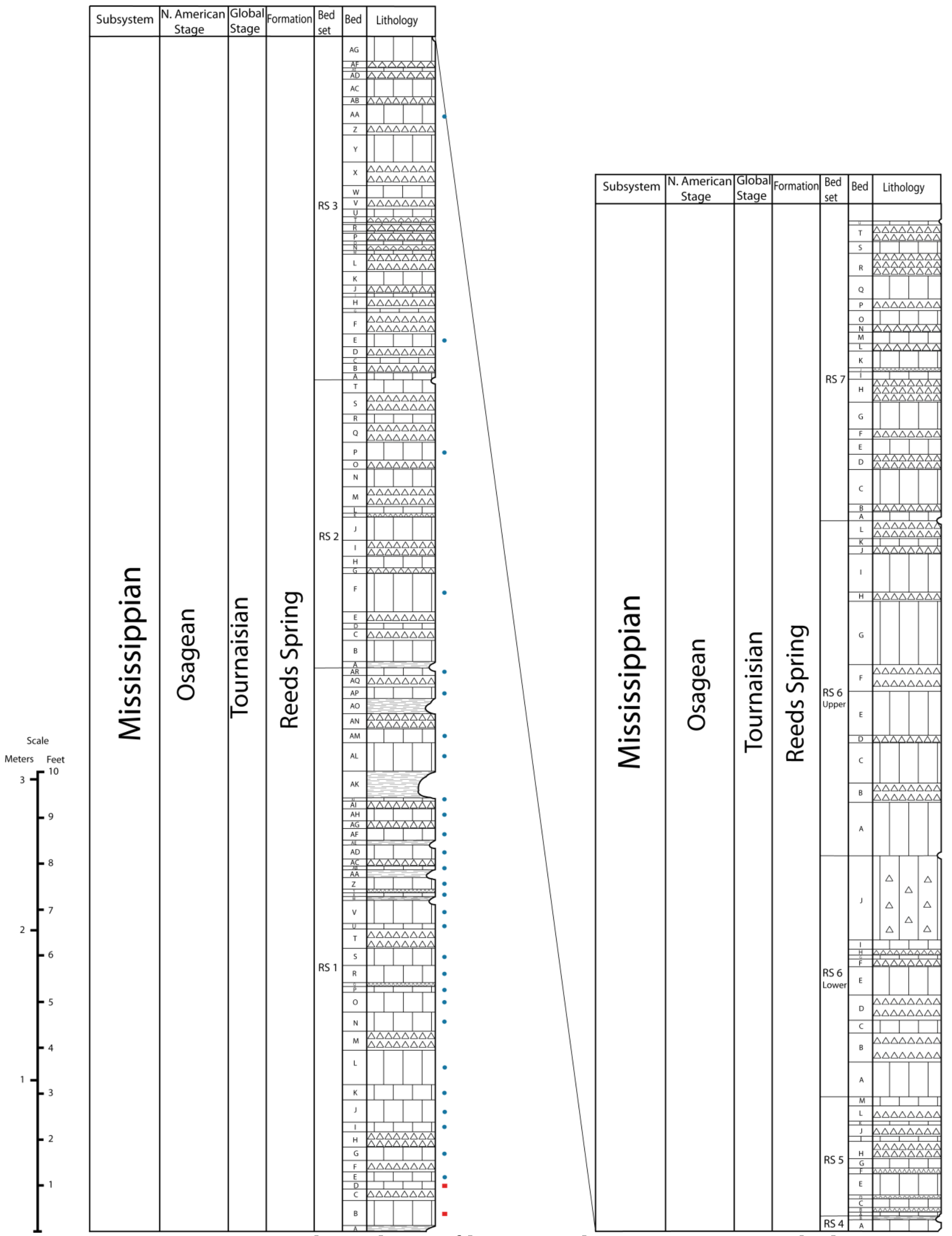

Figure 4.3. Stratigraphic column of lower Reeds Spring Formation beds RS1 through RS7 showing bedsets, beds, and lithology.

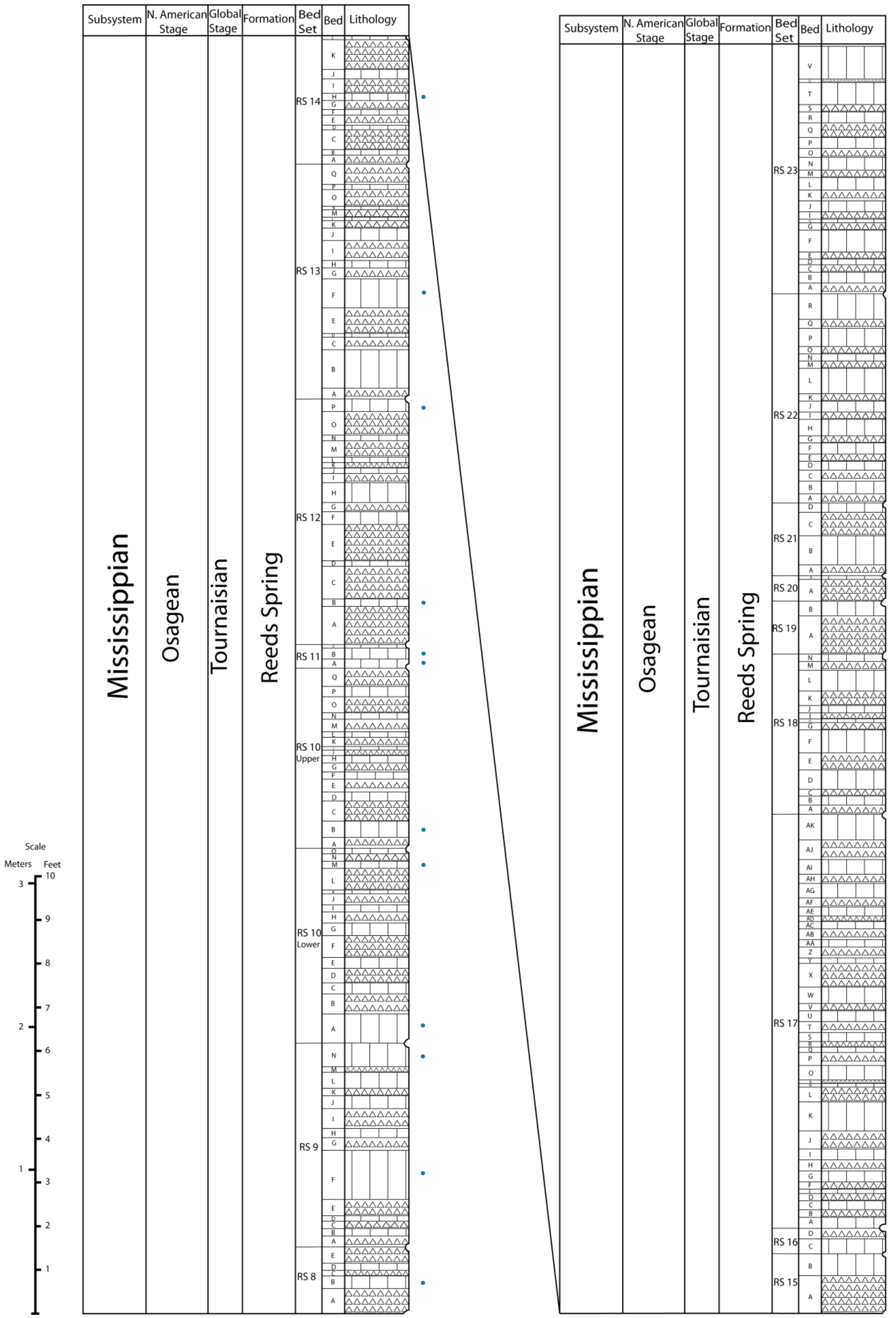

Figure 4.4. Stratigraphic column of upper Reeds Spring Formation beds RS8 through RS23 showing bedsets, beds, and lithology.

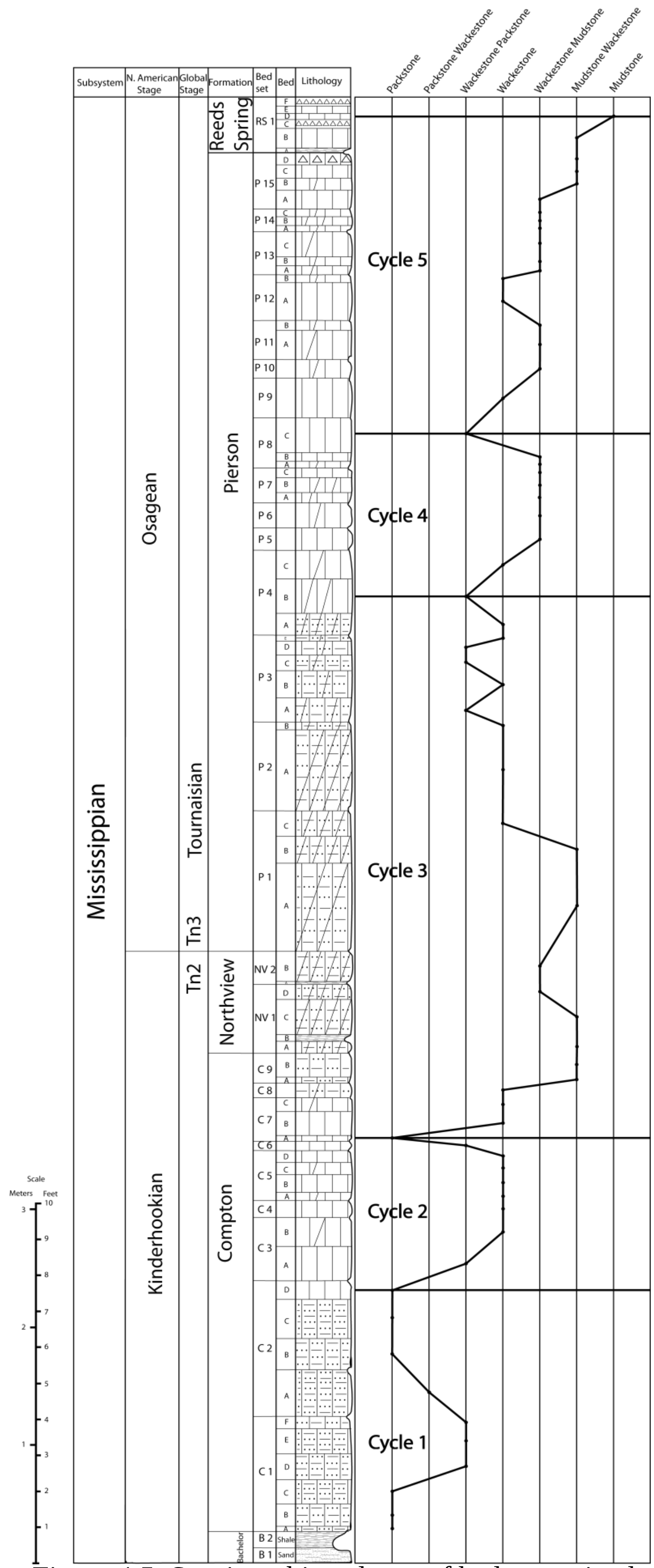

Figure 4.5. Stratigraphic column of beds examined in thin section and the textures found therein.

Bachelor Formation

The Bachelor Formation at this location contains both the lower sand and the upper shale member Fig 4.2 and is a total of 26.67 cm (10.5 in) thick. The lower sandstone member is approximately 11.43cm (4.5 in) thick in this area. It has a poikilitic calcareous cement and has a greenish color which is indicative of it's marine origin. The sandstone member is very resistant to weathering and is easily distinguished from the Ordovician age Cotter Dolomite which lies below it and the overlying shale member.The upper shale member is 15.24 cm (6 in) thick. The shale member is a green unconsolidated soft clay and contains a fair amount of siliciclastic grains.

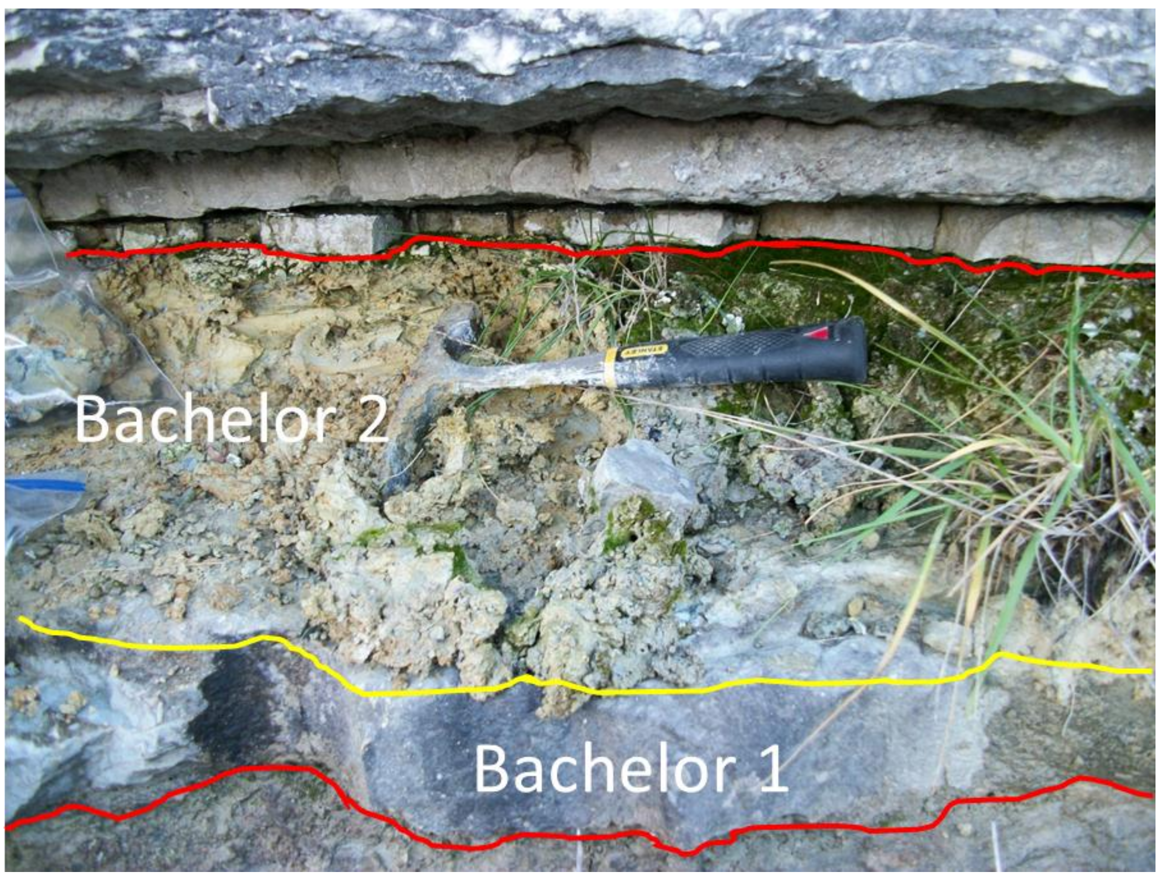

Figure 4.6. An example of the Bachelor Formation in the study area. The boundary of the Bachelor Formation is marked by red lines. The divisions of the beds within the Bachelor Formation are marked by the yellow line.

Compton Limestone

The Compton Limestone is 4.04 m (13.27 ft) thick in the study area. The beds range anywhere from 5.08-40.64 cm (2-16 in) thick. The textures range from packstone to mudstone-wackestone (Fig 4.5) and are loaded with bryozoans and echinoderms (crinoids). There are shale whisp within the formation which is seen in cut hand samples and in the microscope. The formation was broken into 9 bedsets and several beds within those bedsets. Beds and bedsets were determined by the significance of the breaks in the rock. Bedset breaks were significant and seen from a distance while the beds within the bedset were not seen until more closely examined.

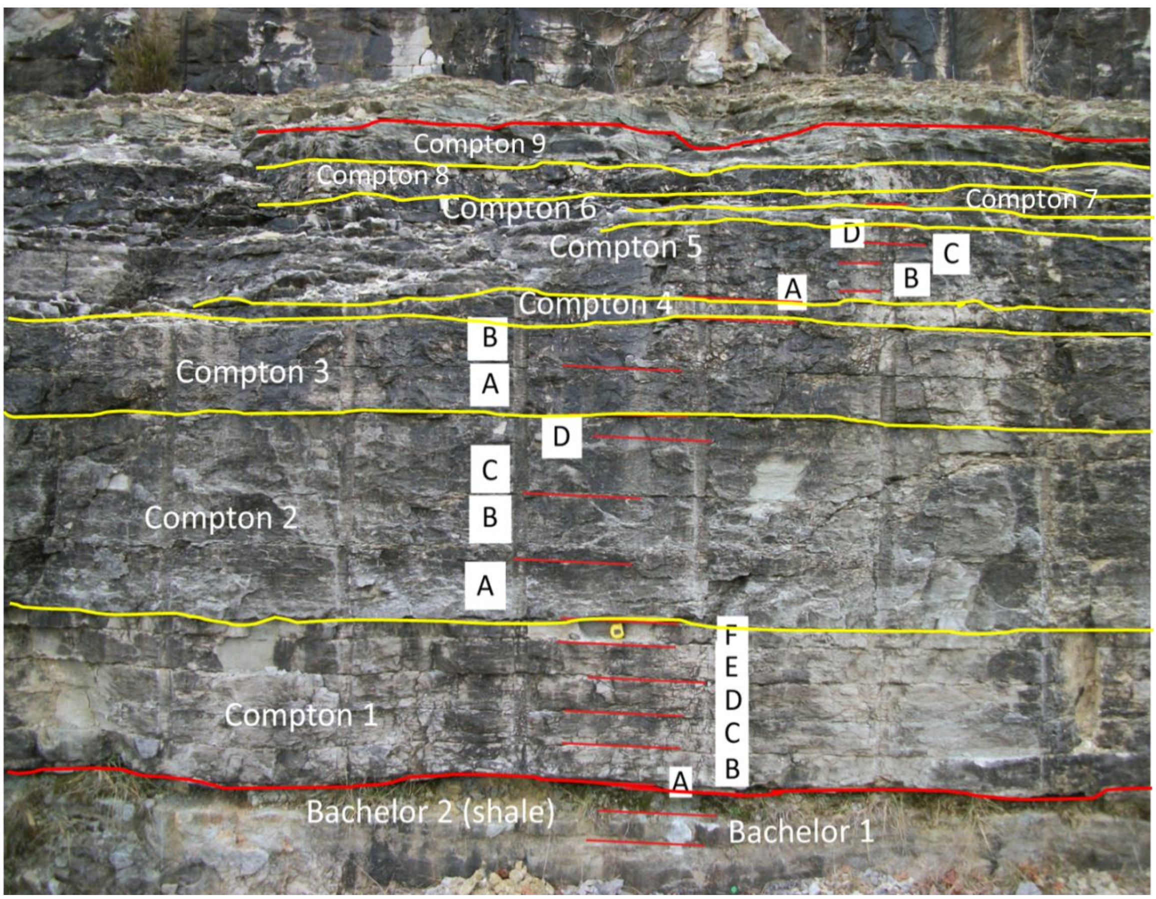

Figure 4.7. The Compton Limestone in the study area. Continuos red lines separate formations, yellow lines separate bedsets, and short red lines separate beds.

Petrographic Analysis:

Petrographic analysis of the Compton Limestone on a bed by bed basis reveals that the texture ranges anywhere from a packstone at the base to a mudstone-packstone at the top of the Compton Limestone (Figure4.8). Most textures range from a packstone to wackestone for the entirety of the formation.

The contact between the Compton Limestone and the Bachelor Formation is an abrupt change from the upper shale member of the Bachelor Formation and the packstone found at the base of the lower Compton Limestone. An abundant amount of silt sized clastics were found in the upper shale member of the Bachelor Formation and this continues into the lower Compton Limestone until they disappear in Compton 2D. Very small amounts of dolomite were found in Compton 3B, 5C, 7C, and C8 usually in mud dominated areas of the acetate peel and shale partings. Starting at Compton 7A the rock texture is mudstone-wackestone which indicates a transition into the lower Northview Formation. The transition is also seen in the amount of clastics that are found at the top of the Compton Limestone. Starting at C8 the rocks become silty and the carbonates fine upward from a wackestone to a mudstone-wackestone at the Compton Limestone and Northview Formation contact. This texture continues into the bottom of the Northview Formation making the contact transitional (Figure 4.13).

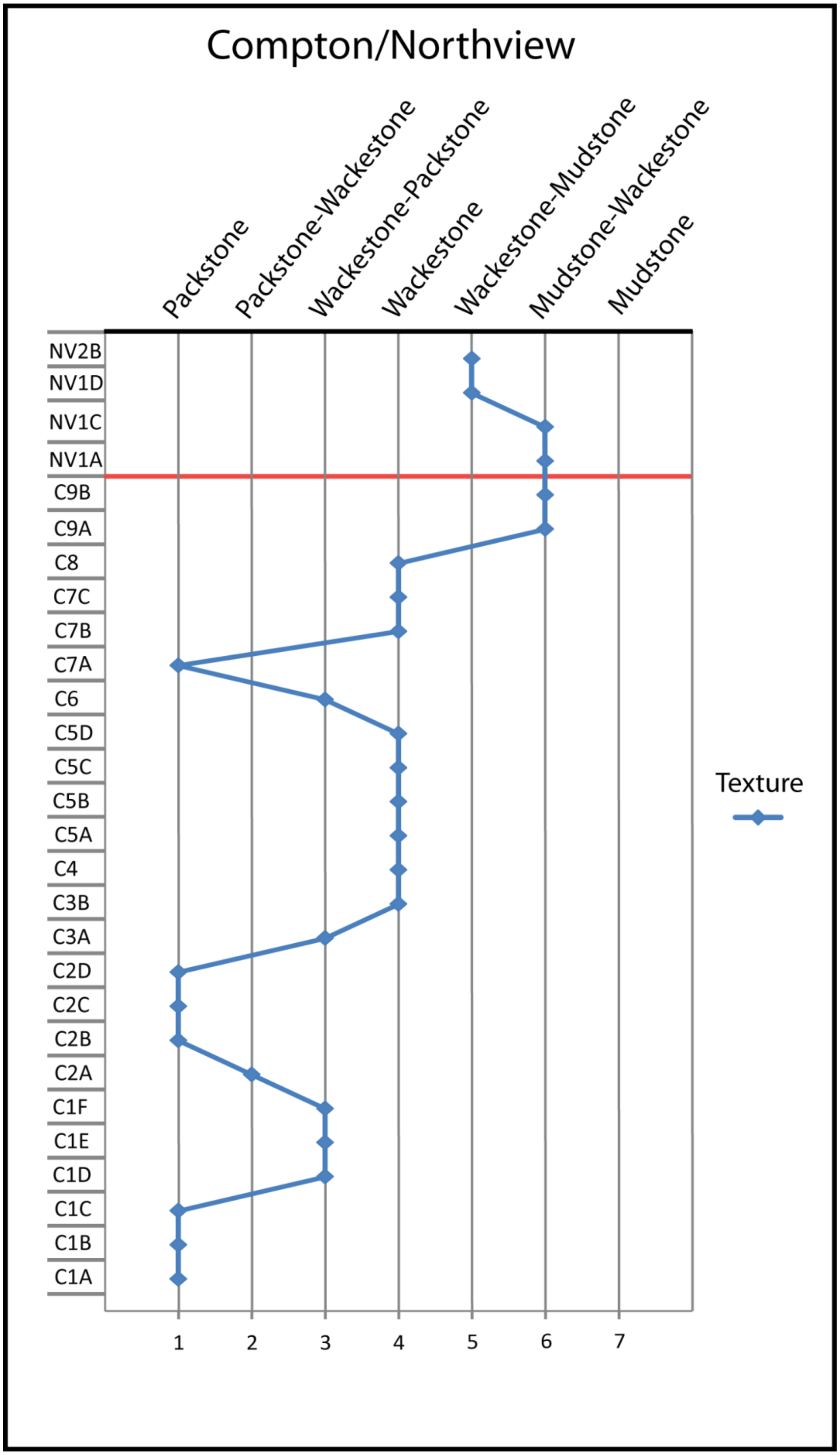

Figure 4.8. Petrographic texture chart showing the textural fluctuation of the Compton Limestone and Northview Formation.

The lower Compton Limestone contains siliclastics which continue through C2D suggesting a transitional change from the Bachelor Formation to the lower Compton Limestone. The texture from C1A through C3A ranges from packstone to wackestone-packstone. Unit C3B is wackestone and fines upward through the rest of the formation.

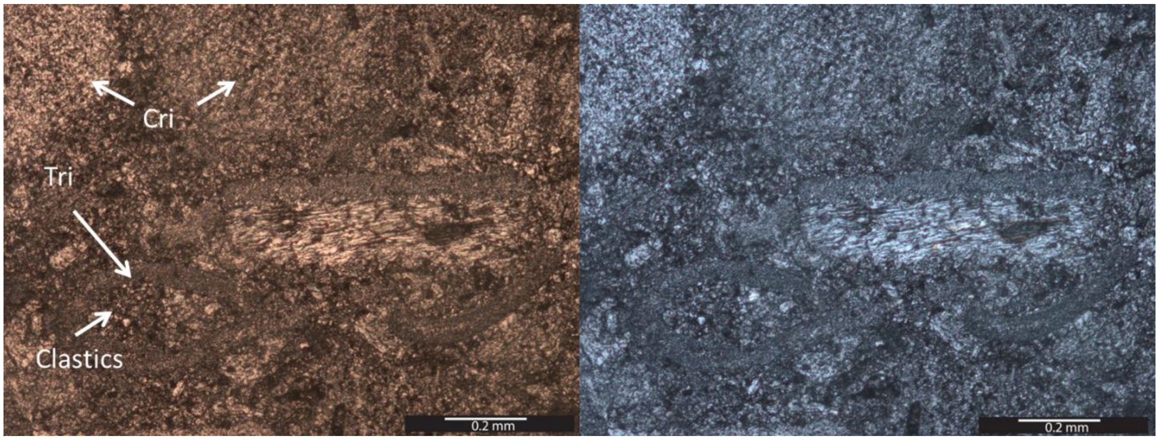

Figure 4.9. Bed C1A is a packstone that contains clastics (quartz silt). Clastics, which are common in the Bachelor Formation continue into the lower Compton Limestone. Bioclast included are crinoids (Cri) and trilobites (Tri). Left-Plane Polarized Light (PPL). Right-Cross Polarized Light (CPL). Pictures shown are acetate peels.

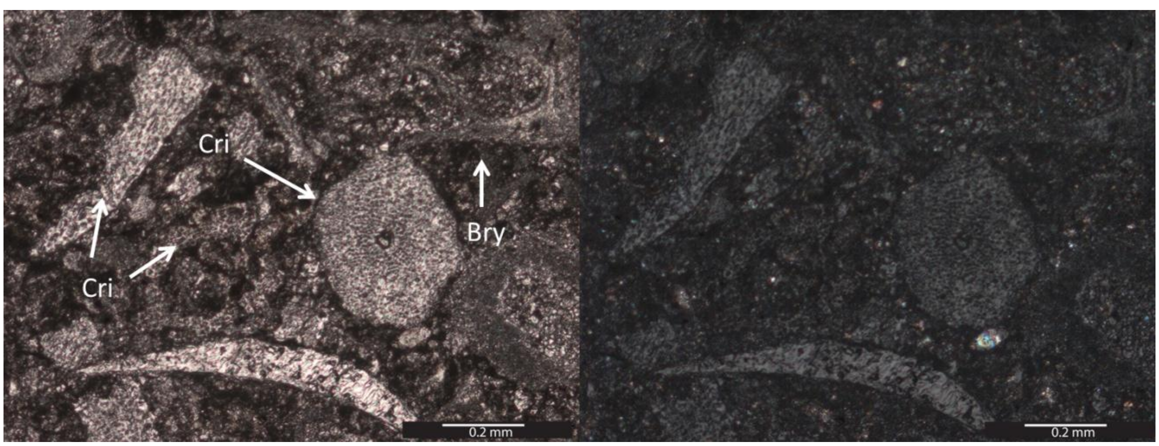

Figure 4.10. Bed C1B is a packstone that contains clastics (quartz silt). Clastics, which are common in the Bachelor Formation continue into the lower Compton Limestone. Crinoids (Cri) and bryozoans (Bry) are the main constituents. Brachiopods and trilobites are also present in a small amount. Left (PPL). Right (CPL).

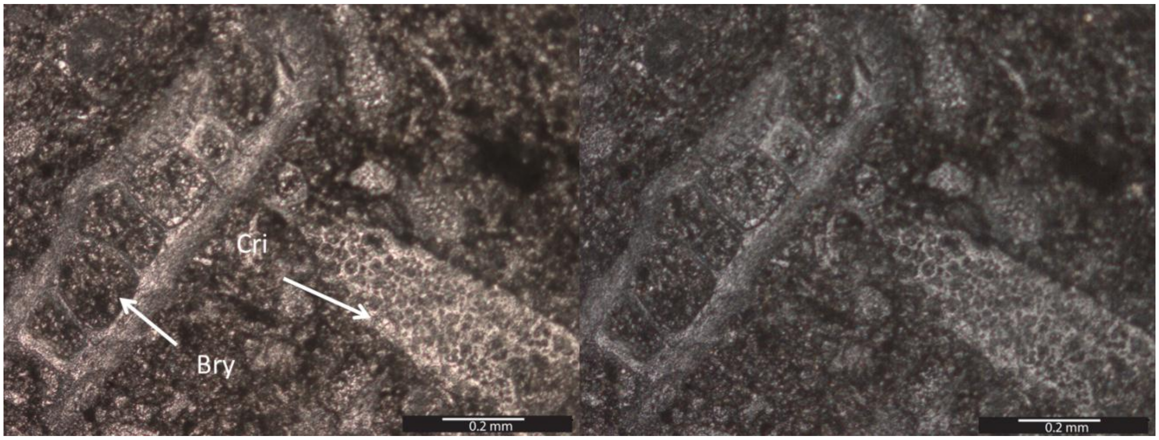

Figure 4.11. Bed C1D is a wackestone-packstone containing crinoids (Cri), bryozoans (Bry) and silt size siliciclastics in the matrix. Left (PPL). Right (CPL).

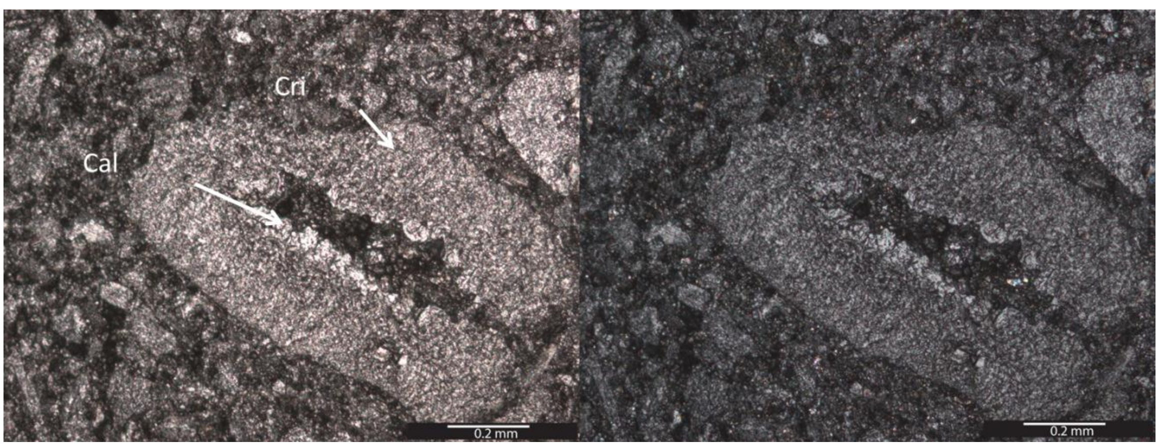

Figure 4.12. Bed C1E is a wackestone-packstone with abraded crinoid bioclast (Cri) containing blocky calcite cement (Cal). Left (PPL). Right (CPL).

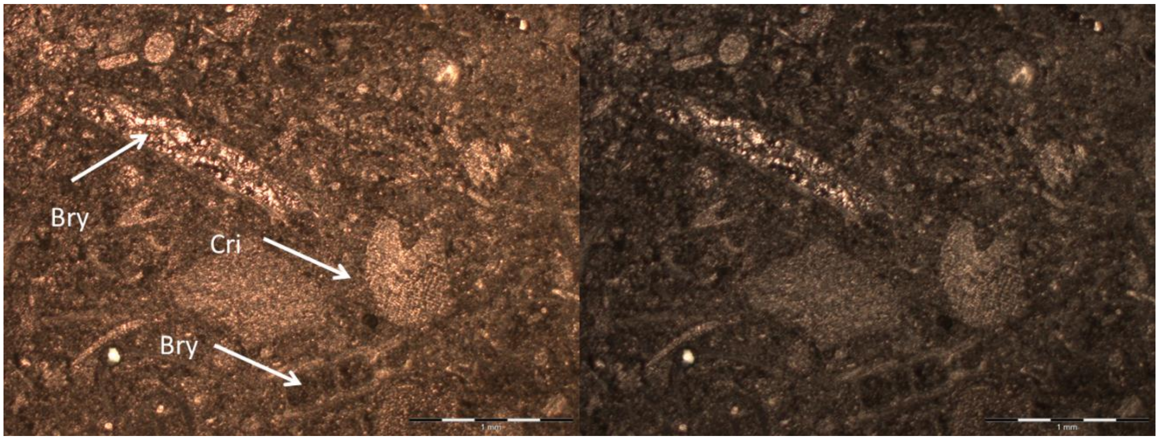

Figure 4.13. Bed C2C is a packstone containing crinoids (Cri) and bryozoans (Bry). Left (PPL). Right (CPL).

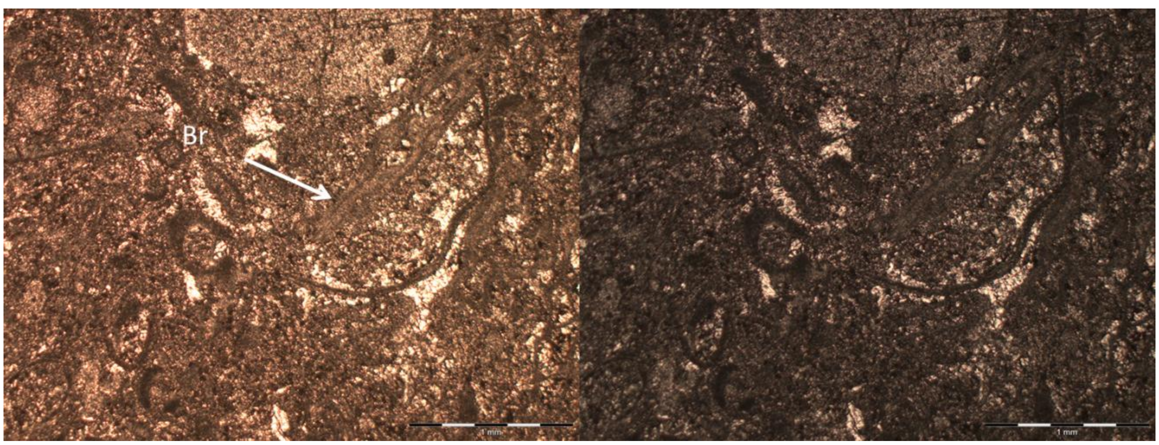

Figure 4.14. Bed C7A is a packstone containing brachiopod (Br) with some infilling of calcite occurring. Left (PPL). Right (CPL).

At the top of the Compton Limestone the texture changes to wackestone and mudstone-wackestone. Siliciclastics are reintroduced in C8 and continue through the top of the Compton Limestone and into the Northview Formation suggesting the contact between the Compton Limestone and the Northview Formation is transitional.

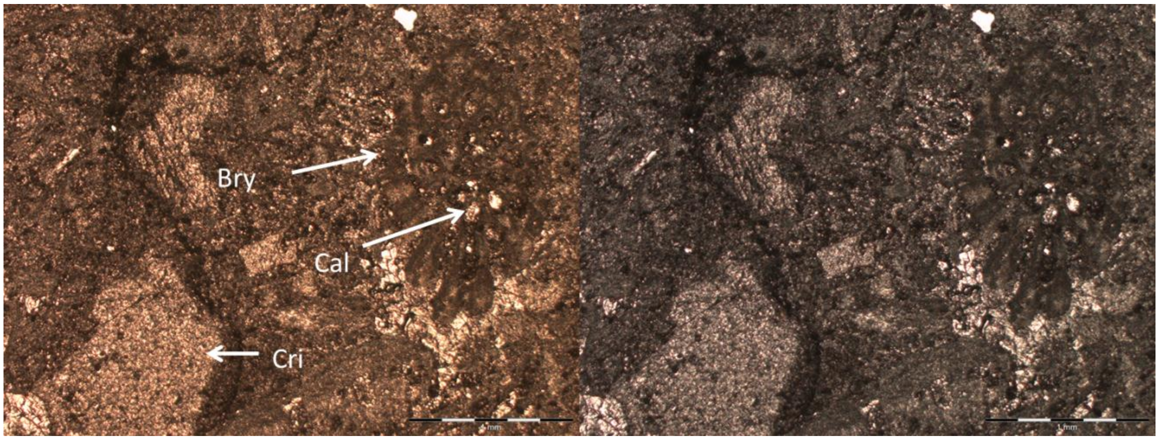

Figure 4.15. Bed C8 is a wackestone with bryozoan (bry), crinoids (Cri), and blocky calcite (Cal) shown. Left (PPL). Right (CPL).

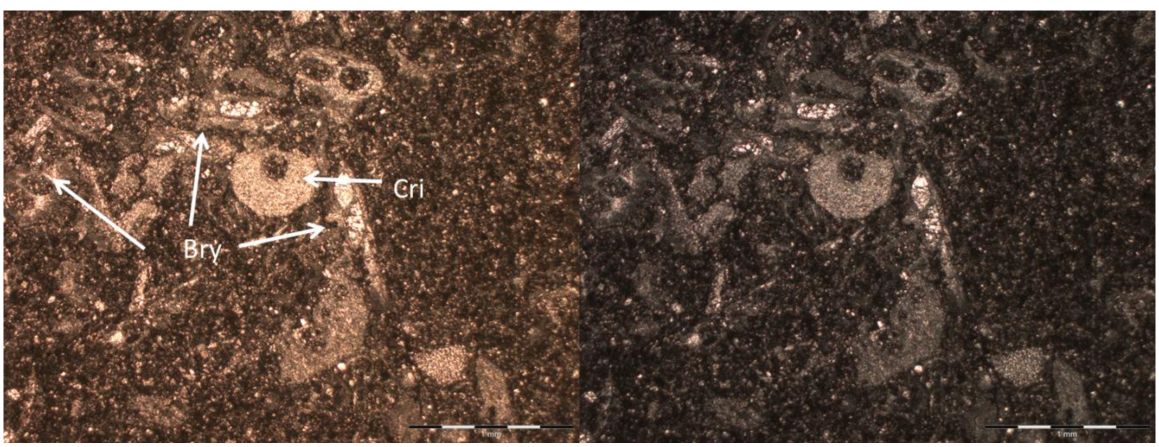

Figure 4.16. Bed C9B is mudstone-wackestone containing bryozoans (Bry) with intraparticle blocky calcite, and crinoids (Cri). Left (PPL). Right (CPL).

Northview Formation

The Northview Formation is a total of 0.91m (3 ft) thick at this site (Fig 4.2 and 4.5). This formation is broken into 2 bedsets. The first bedset consist of four beds of which 3 are silty dolomitic/calcitic limestones with textures of mud-wacke and wacke-mud with a bluish to bluish grey color and the other bed being light gray shale. The upper bedset contains 2 beds, a light gray shale at the base and a buff brownish wackestone-mudstone textured dolomitic/calcitic silty limestone (Fig. 4.5). The top of the Northview Formation which is wackestone-mudstone transitions into the mudstone-wackestone at the bottom of the Pierson limestone which appears to make this contact transitional.

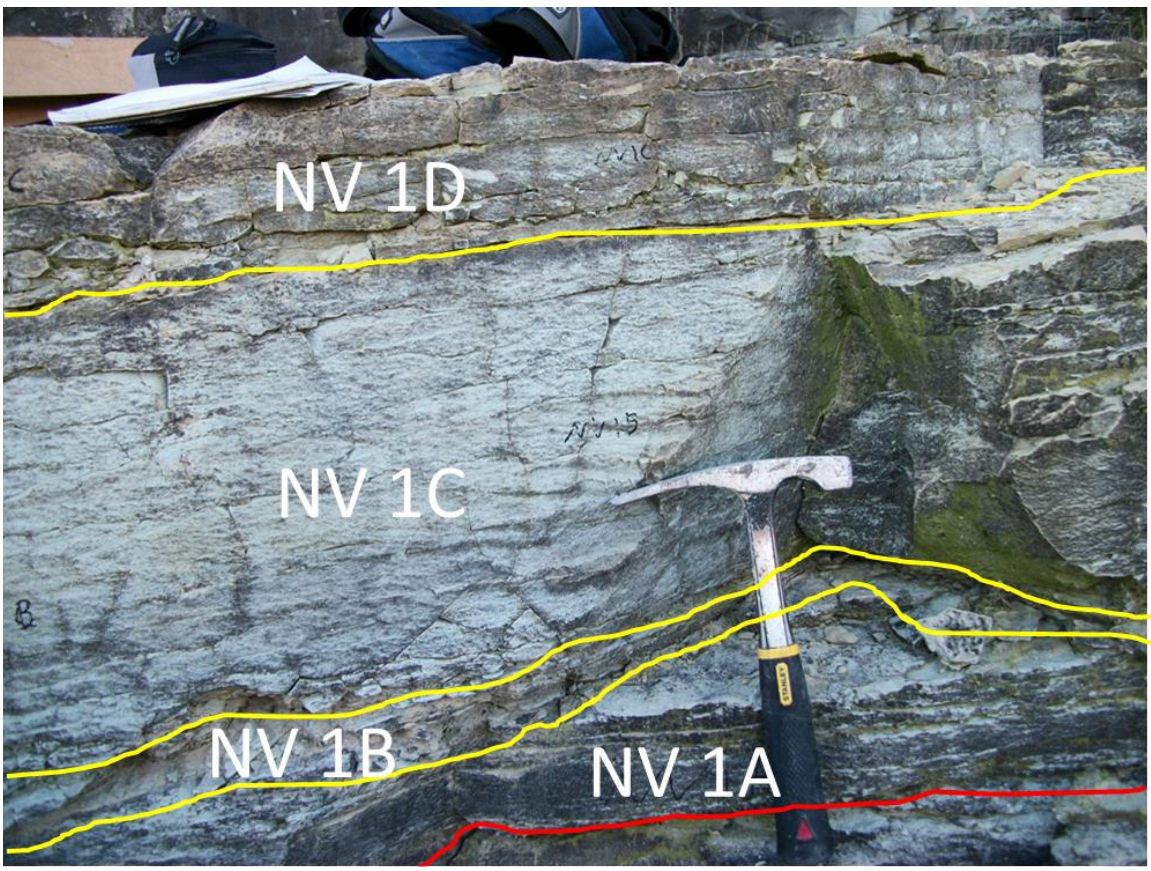

Figure 4.17. The Northview Formation in the study area. Red line indicates the contact between the Northview Formation and the underlying Compton Limestone. Yellow lines indicate bed boundaries.

Petrographic Analysis:

Petrographic analysis of the Northview Formation (Fig 4.18) revealed the rocks to be dolomitic throughout the entirety of this formation. Siliciclastics, which started at the end of the Compton Limestone, continue into the Northview formation and persist across the entire formation making it a silty limestone. The texture changes from mudstone-wackestone at the base to wackestone-mudstone at the top where it is in contact with the underlying Pierson Limestone.

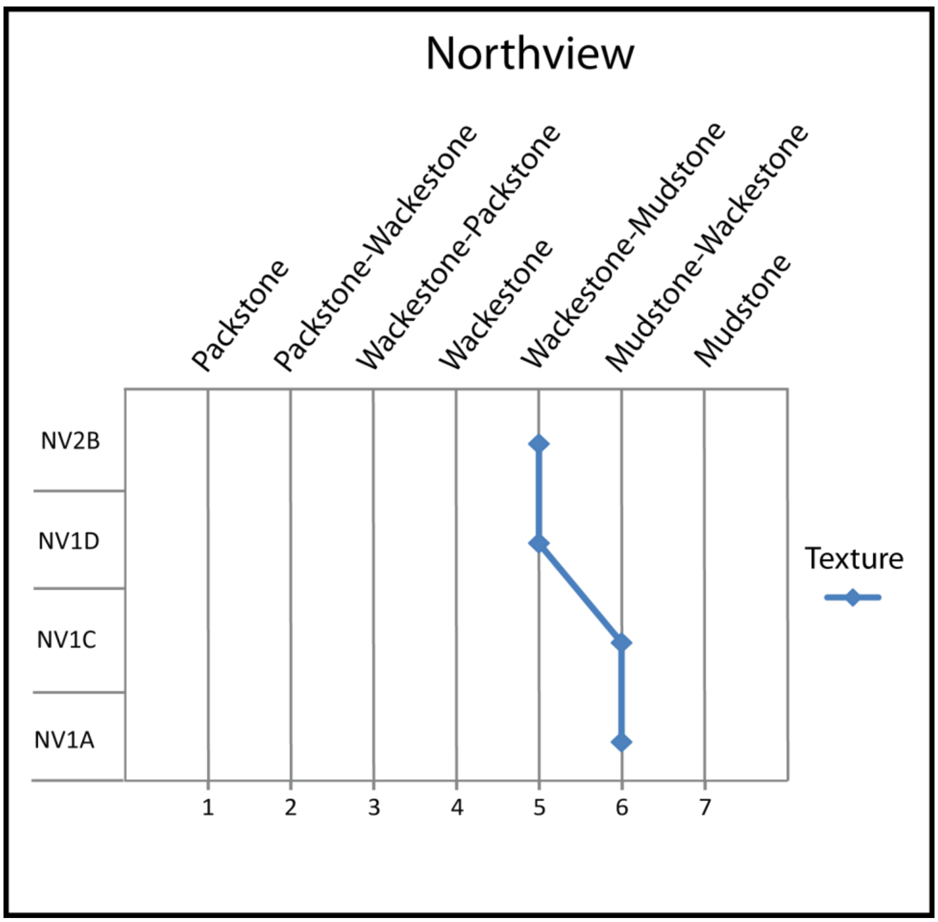

Figure 4.18. Petrographic texture chart showing the textural change across the Northview Formation.

The base of the Northview Formation is increasingly dolomitic compared to the dolomite found at the top of the Compton Limestone. Sample NV1A is a silicieous dolomitic silty mudstone-wackestone. Several fossils contain intraparticle blocky calcite fillings.

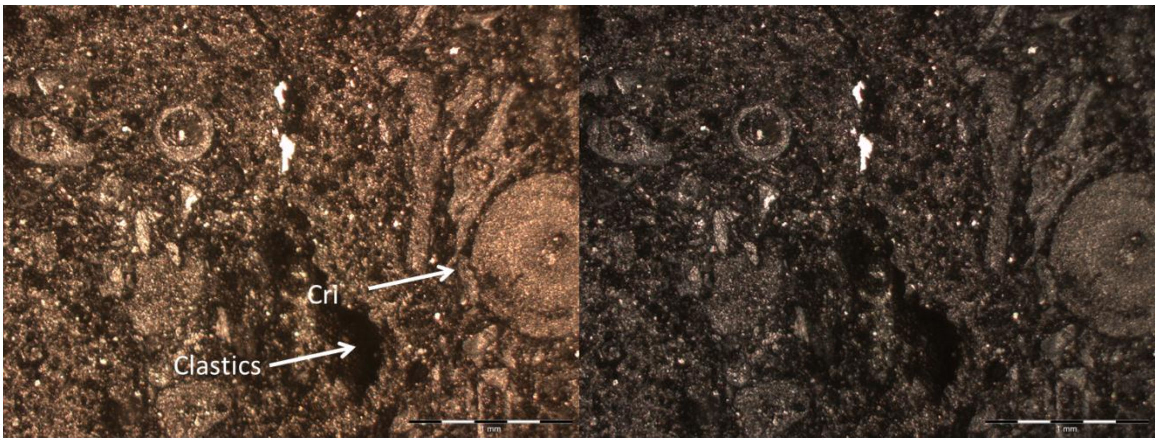

Figure 4.19. Bed NV1A is a mudstone-wackestone containing dolomite and is loaded with clastics. The most common biological constituent found are crinoids (Cri). Left (PPL). Right (CPL).

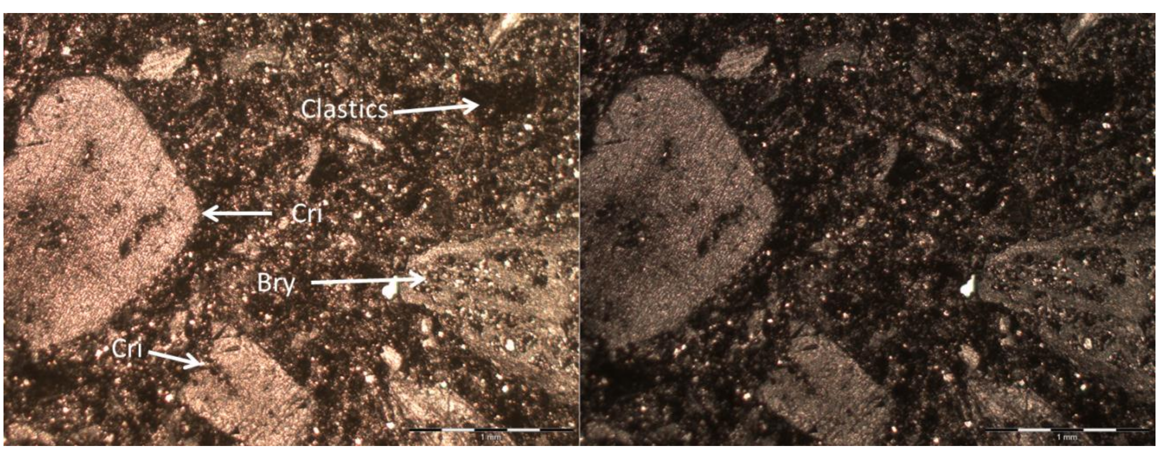

Figure 4.20. Bed NV1C is a mudstone-wackestone containing crinoids (Cri) and bryozoans (Bry). Clastics as shown still dominate the matrix this formation. Left (PPL). Right (CPL).

At the top of the first bedset (sample NV1D) the texture changes to wackestone-mudstone and becomes even siltier. In addition, the color of NV1D and NV2B are darker than the base of the Northview Formation. Sample NV2B is a silty wackestone-mudstone containing abundant bryozoans and crinoids (fig. 4.21)

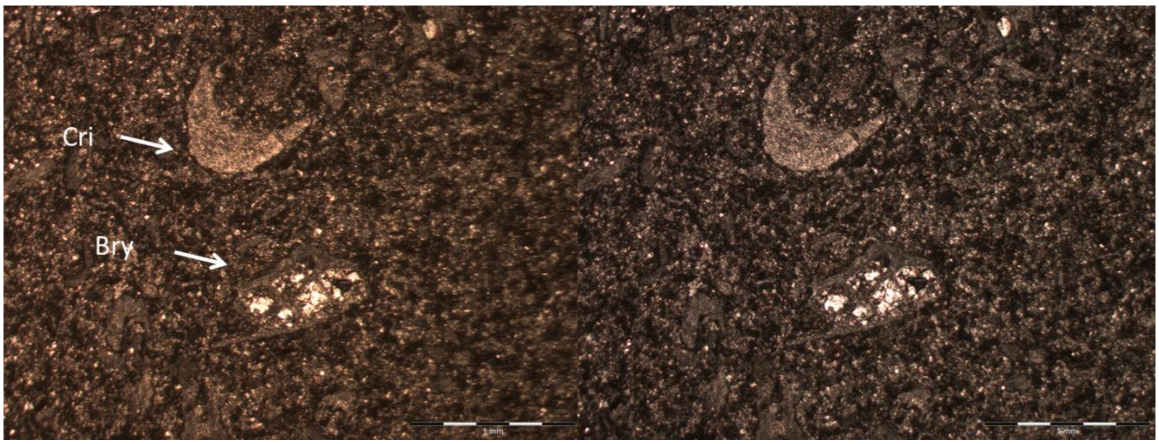

Figure 4.21. Bed NV2B is a wackestone-mudstone containing quartz silt. Some of the fossils that can be found in this bed include crinoids (Cri) and bryozoans (Bry). Some calcite infilling is occurring. Left (PPL). Right (CPL).

Pierson Limestone

The Pierson Limestone (Fig 4.2 and 4.5) is 6.7m (22 ft) of thinly bedded limestone ranging anywhere from 5.08cm to 76.2cm (2in to 30 in) beds. The lower Pierson beds contain abundant dolomite and silt/siliciclastics through bed A of bedset 4 where siliclastics end. Dolomite is present throughout the Pierson Limestone in varying amounts. Pierson 15 D contains chert nodules at the contact with the Reeds Spring Formation. The Pierson Limestone texture gradually fines upward to a mudstone-wackestone texture, transitioning into the lower Reeds Spring (Fig. 4.5). The Pierson Limestone was subdivided into 15 bedsets for the purpose of petrographic analysis.

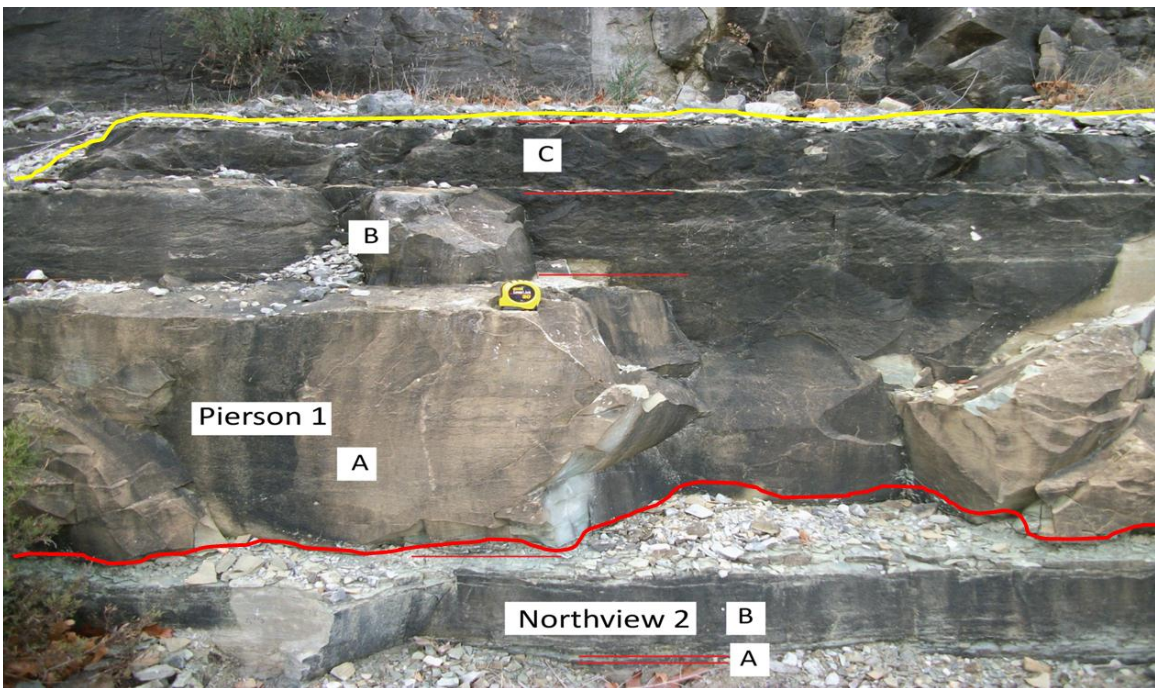

Figure 4.22. The lower Pierson Limestone and top of the Northview Formation in the study area. Continuousred lines separate formations, short red lines separate individual beds, and the yellow line separates the beds within the same formation.

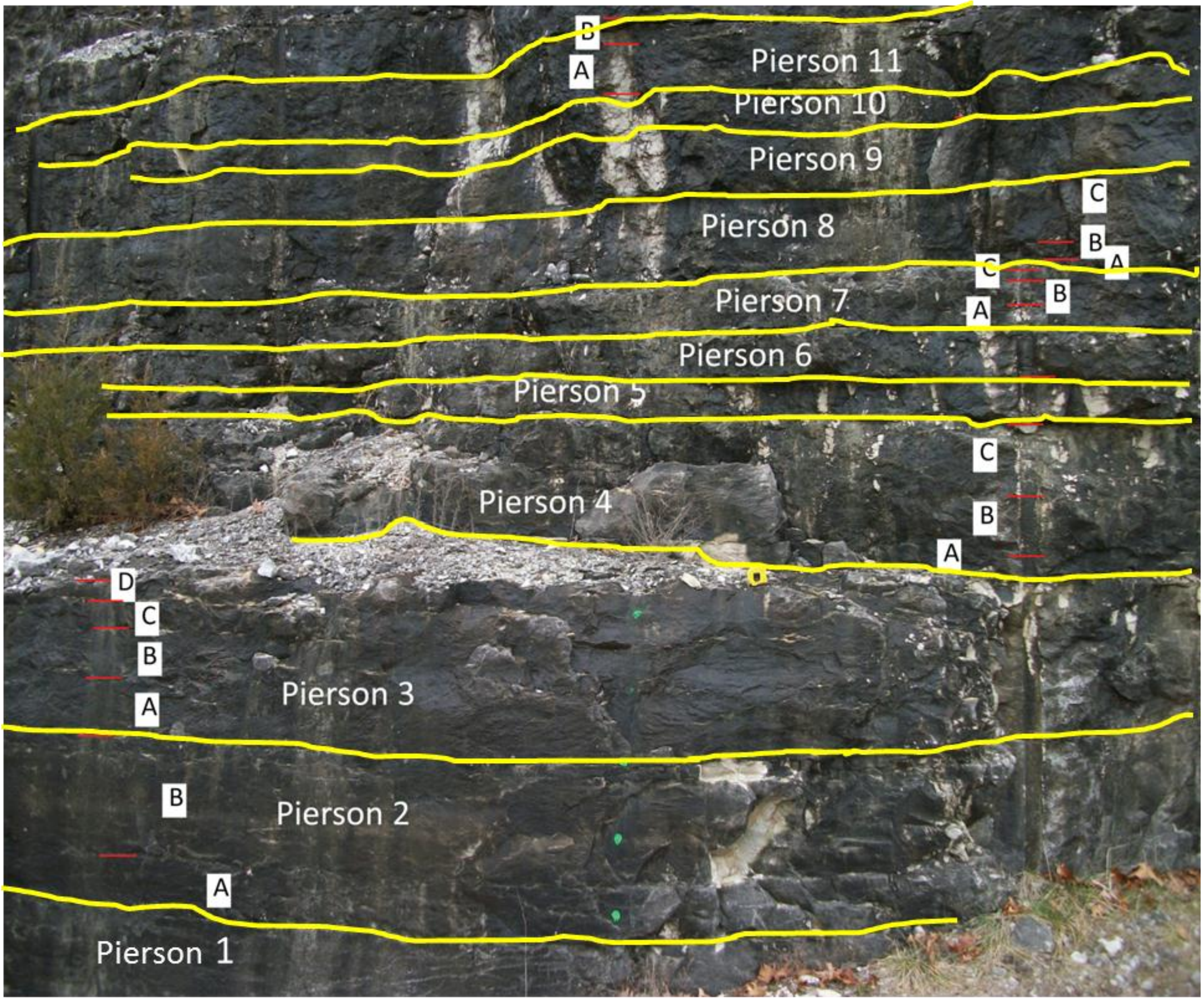

Figure 4.23. The middle Pierson Limestone in the study area. Short red lines separate beds and yellow lines separate bedsets within the same formation.

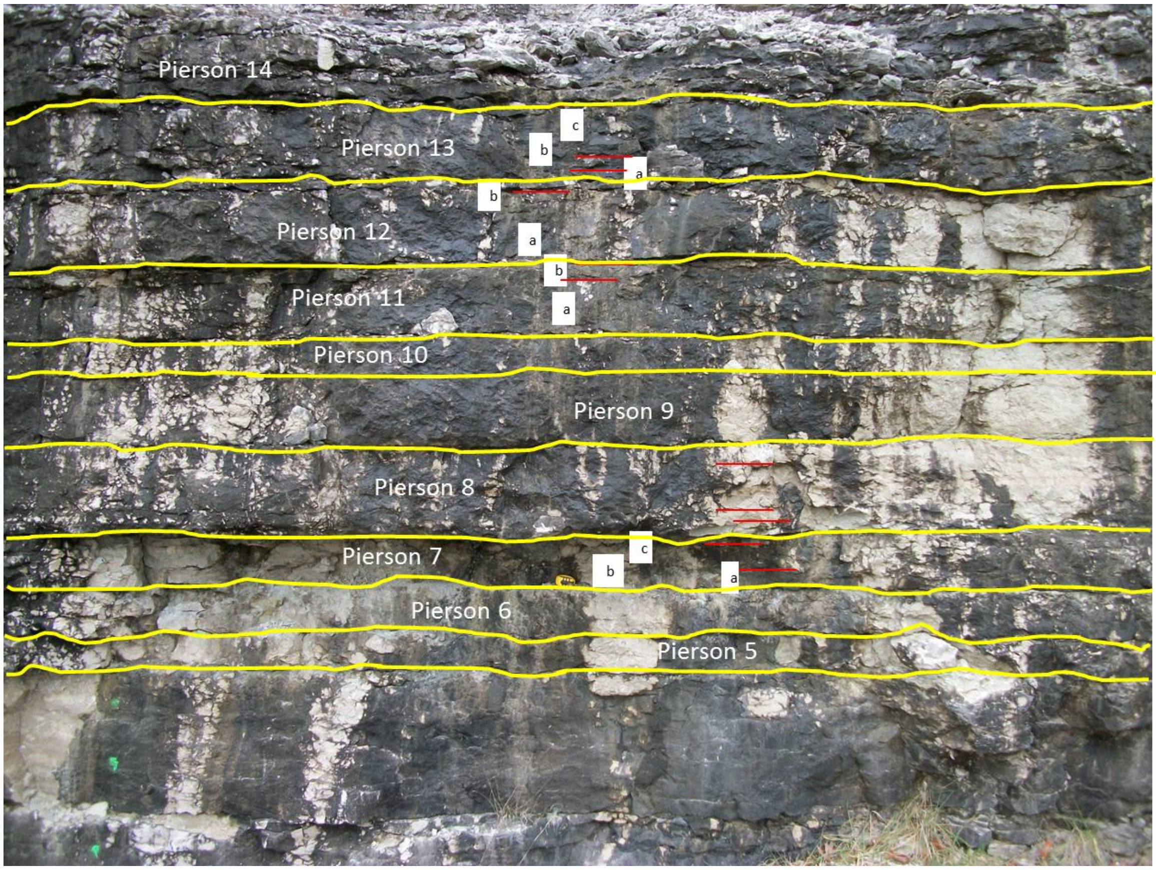

Figure 4.24. The middle Pierson Limestone in the study area. The short red lines separate beds that are visible. Yellow lines separate beds within the same formation.

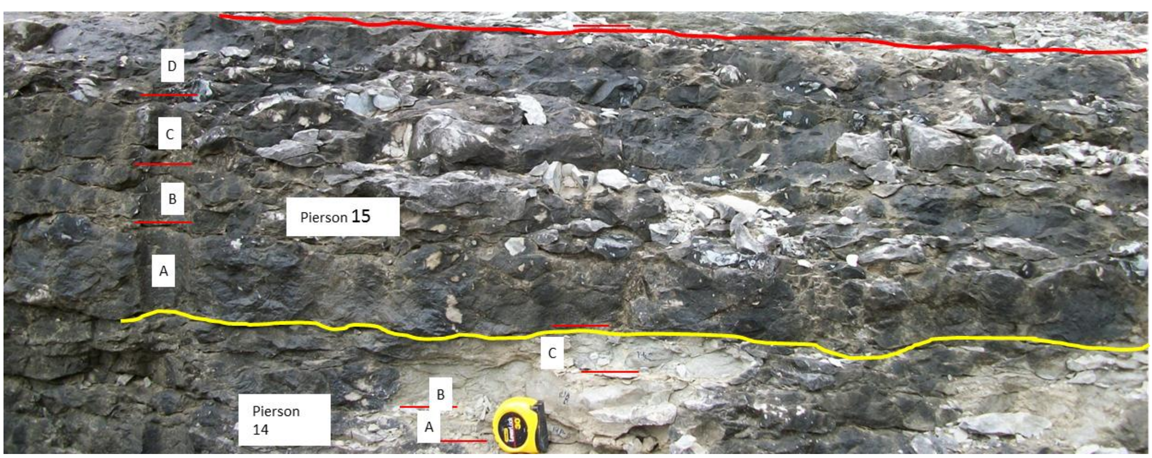

Figure 4.25. The top of Pierson Limestone in the study area. Continuous red lines separate formations, short red lines mark bed boundaries, and yellow lines separate bedsets within the same formation.

Petrographic Analysis:

The Pierson Limestone exhibits several textural changes as determined from petrographic analysis. (Fig. 4.26) The contact between the Northview Formation and the Pierson Limestone is transitional with the texture fining upward from a wackestone-mudstone at the top of the Northview Formation into a mudstone-wackestone at the base of the Pierson Limestone. The siliciclastics of the silty limestone continue at the base of the Pierson Limestone from the Northview Formation and persists through P4A. Dolomite is quite abundant at the base of the Pierson Limestone. Beds P1A-P2A are dolomitic and P2B-P4C contain smaller amounts of dolomite usually found in mud whisps and shale partings with minute amounts found in the matrix. From bed P6 to the top of the Pierson, dolomite is present in the formation in small amounts. Evidence suggest the top of the Pierson Limestone is transitional with the base of the Reeds Spring Formation. The top of the Pierson Limestone is a mustone-wackestone transitioning into the lower mudstone found at the base of the Reeds Spring Formation. Pierson 15D contained large inclusions of chert that do not show in acetate peels, providing more evidence of a transitional contact into the Reeds Spring Formation which is known to contain abundant chert.

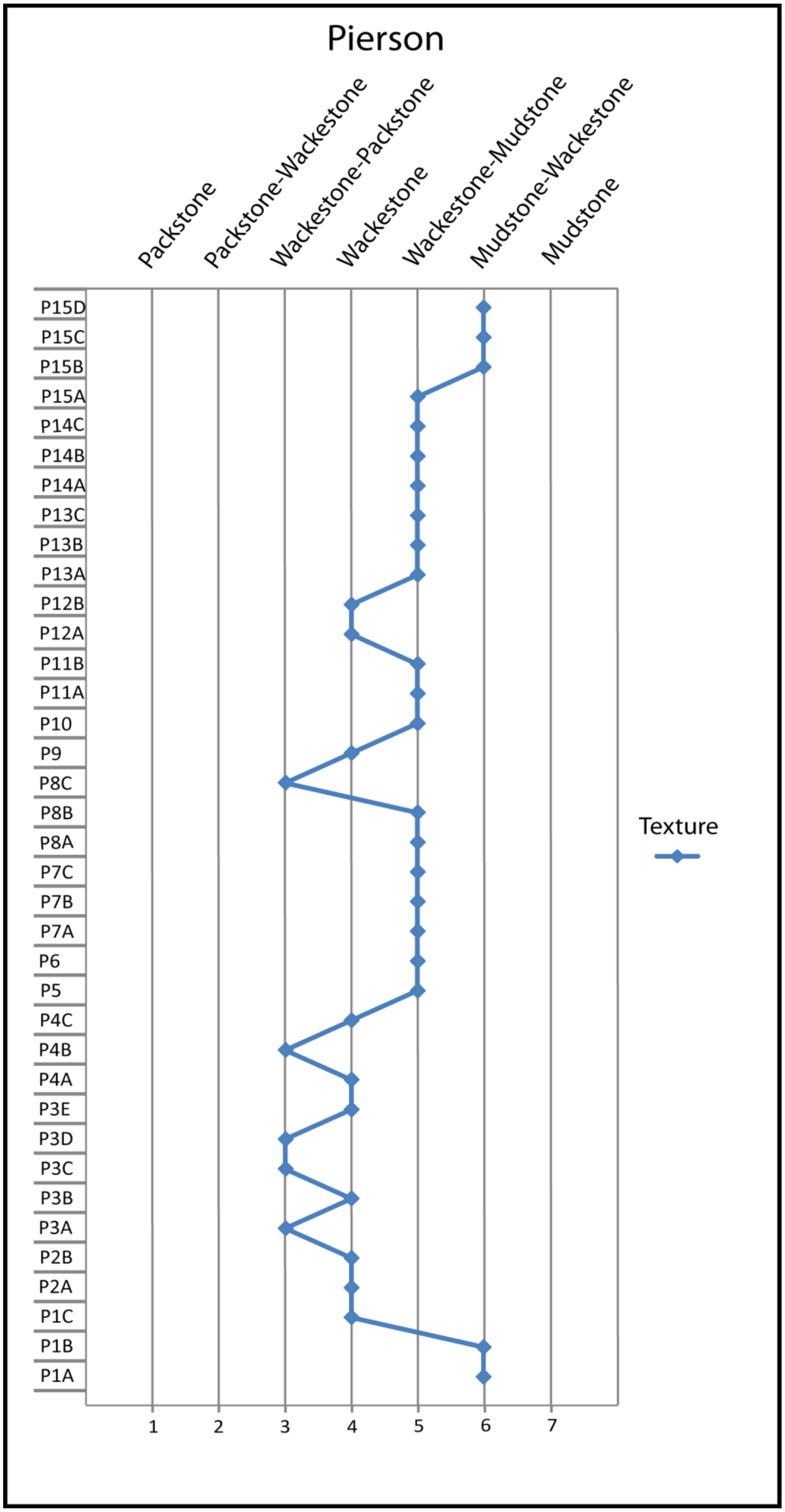

Figure 4.26. Petrographic texture chart showing the changes in texture across the Pierson Limestone.

The lower Pierson Limestone and upper Northview Formation contact appear transitional as the textures are very similar. The amount of dolomite in the lower Pierson remains similar to the Northview Formation except for P1A (4.26) where the dolomite amount is less than the rest of the lower Pierson.

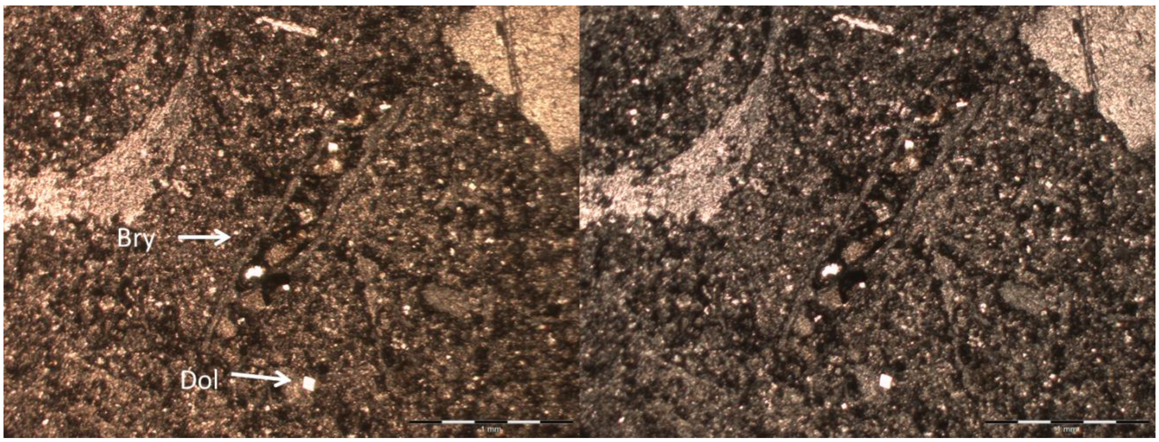

Figure 4.27. Bed P1A is a wackestone-mudstone containing dolomite rhombs (Dol) which are present in the matrix and contains bryozoans (Bry) with intraparticle clastics. Left (PPL). Right (CPL).

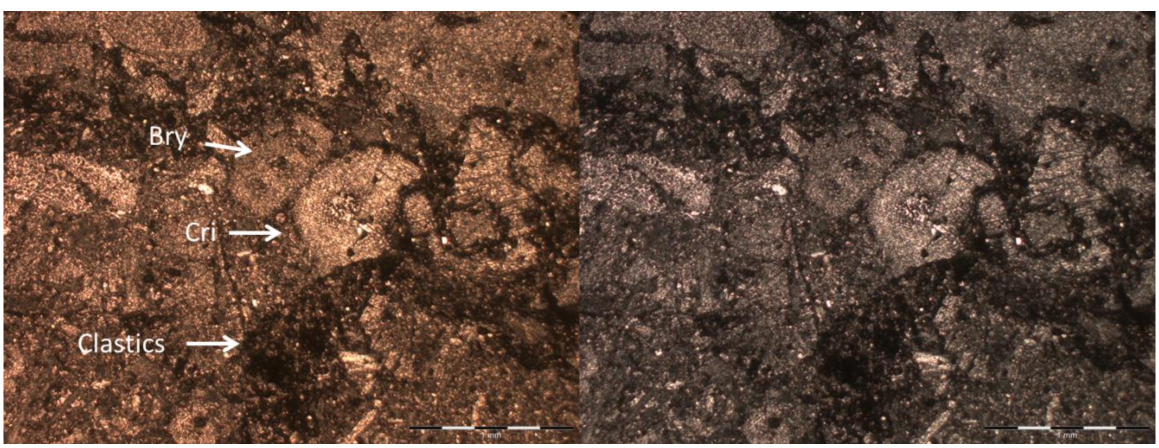

Figure 4.28. Bed P3A is a wackestone-packstone containing bryozoans (Bry), crinoids (Cri), and quartz silt. Also present but not in the picture are trilobites, ostracods, and spicules. Left (PPL). Right (CPL).

P4B marks the boundary where siliciclastics disappear and dolomite becomes less dominant. Dolomite continues to be present in varying proportions through the top of the Pierson Limestone.

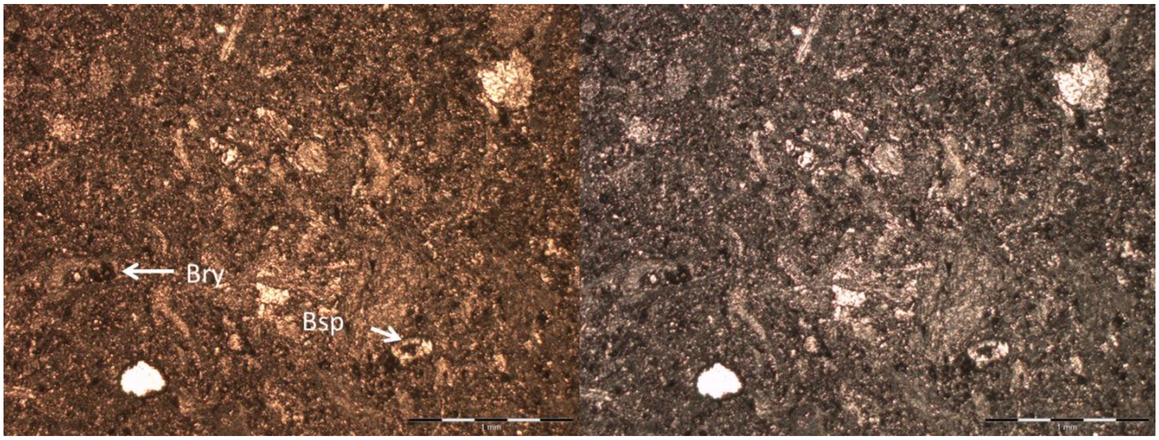

Figure 4.29. Bed P4B is a wackestone-packstone that marks the end of clastics in the lower Pierson Limestone. Grain constituents shown include bryozoans (Bry) and brachiopod spines (Bsp). A pore space is shown but is most likely from the process used to make the acetate peel. Left (PPL). Right (CPL).

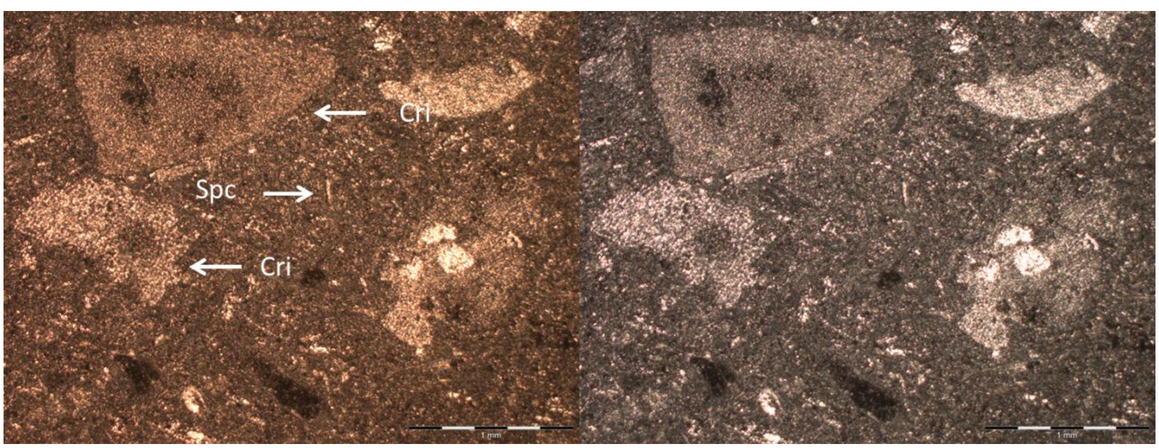

Figure 4.30. Bed P7A is a wackestone-mudstone containing spicules (Spc) and crinoids (Cri). Left (PPL). Right (CPL).

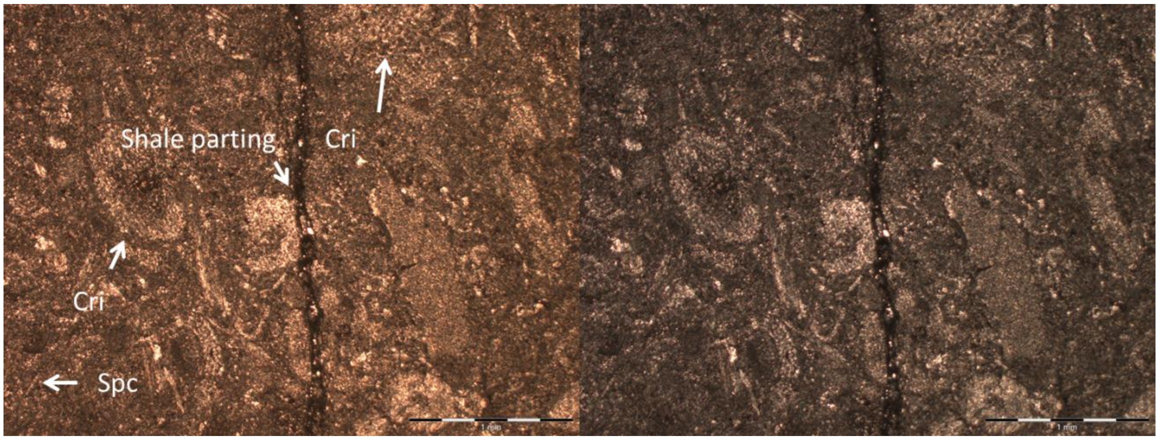

Figure 4.31. Bed P8C is a wackestone-packstone containg crinoids (Cri) and spicules (Spc). The shale parting contains silt. Left (PPL). Right (CPL).

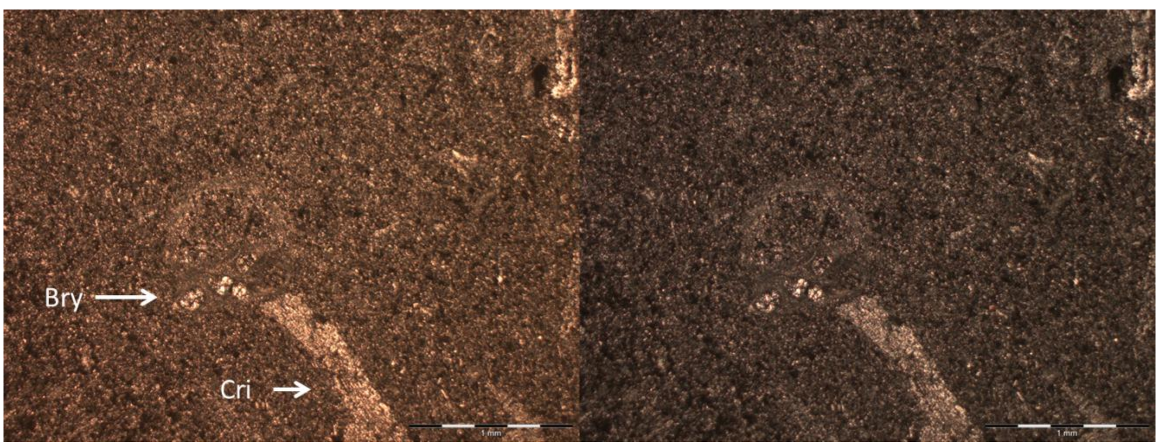

Figure 4.32. Bed P14A is a wackestone-mudstone containing bryozoans (Bry) and crinoids (Cri). Blocky calcite can be seen filling the pore space of the bryozoan Left (PPL). Right (CPL).

P15B (Fig 4.5 and Fig. 4.33) starts the trend of a slow fining upward and transition into the lower Reeds Spring Formation. The top of the Pierson Limestone fines upward to a mudstone-wackestone with the main bioclast being spicules, bryozoans, and trilobites.

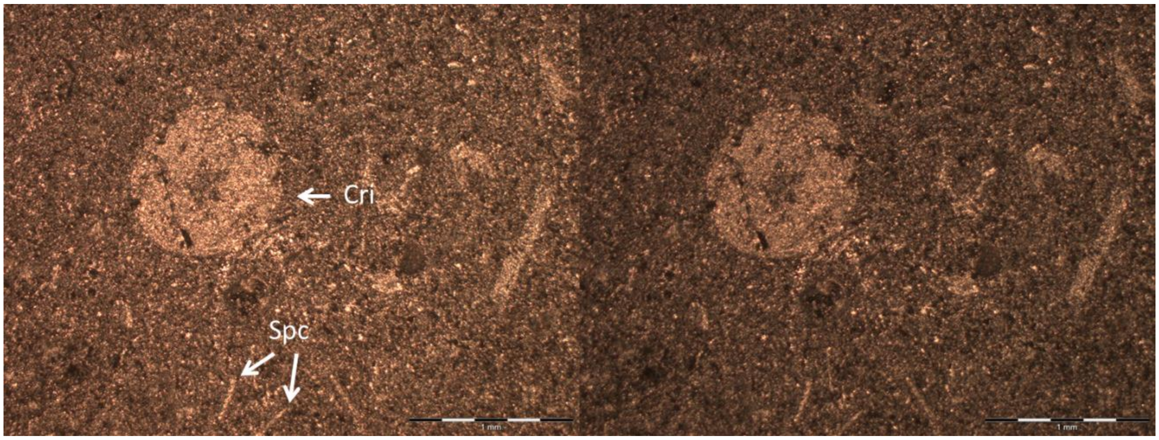

Figure 4.33. Bed P15B is mudstone-wackestone containing crinoids (Cri) and spicules (Spc). Left (PPL). Right (CPL).

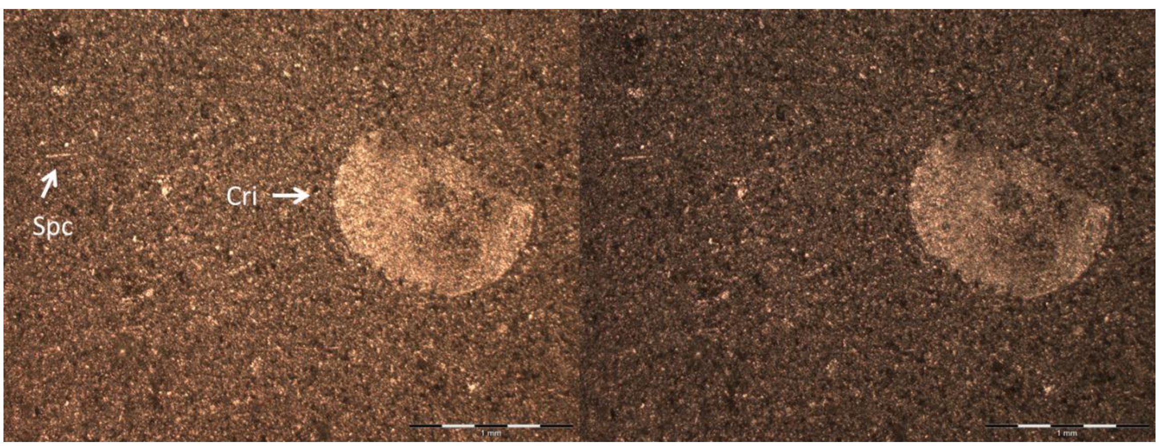

Figure 4.34. Bed P15D is mudstone-wackestone containing spicules (Spc) and crinoids (Cri) within a mud matrix. Left (PPL). Right (CPL).

Reeds Spring Formation

The Reeds Spring Formation is the last and thickest Formation in this study area at 32 m (105 ft) (Fig 4.3, 4.4). The Reeds Spring is a tan limestone with blue and white cherty layers. Two acetate peels were made to help distinguish the contact between the Pierson and Reeds Spring Formations.

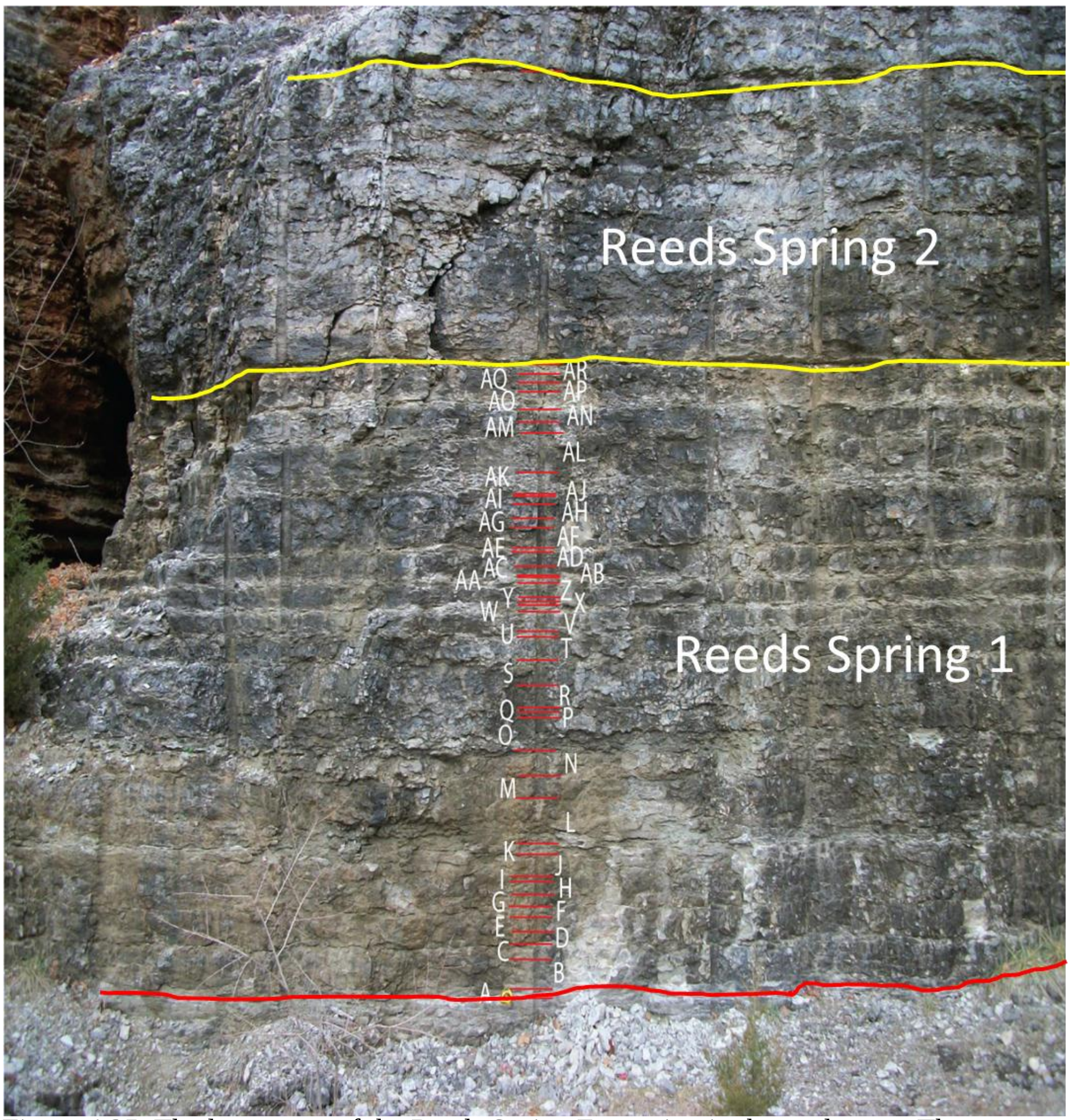

Figure 4.35. The lower part of the Reeds Spring Formation in the study area. The continuous red line represents the separation between the lower Reeds Spring Formation and the Upper Pierson Limestone, the short red lines separate beds within the Reeds Spring 1, and the yellow lines represent the breaks between the bedsets within the Reeds Spring Formation.

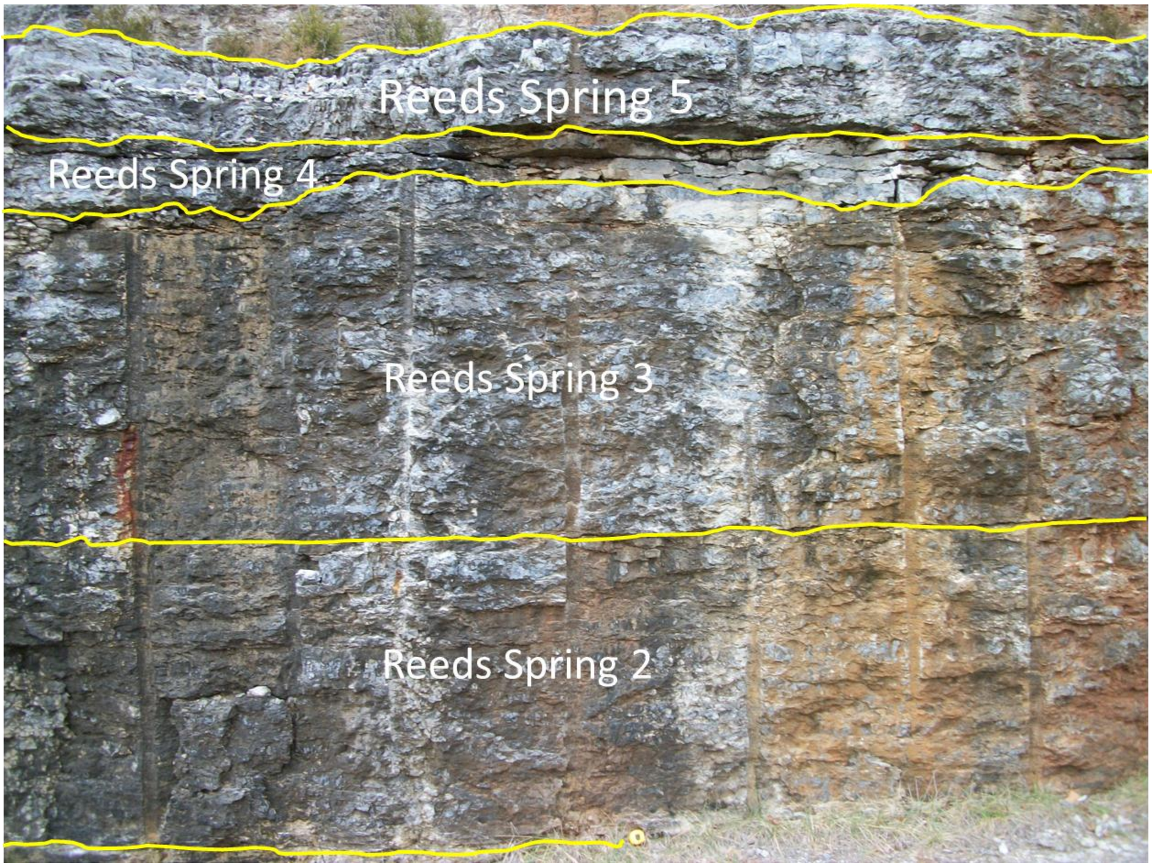

Figure 4.36. The lower part of the Reeds Spring Formation in the study area. The continuous yellow lines represent the separation between bedsets.

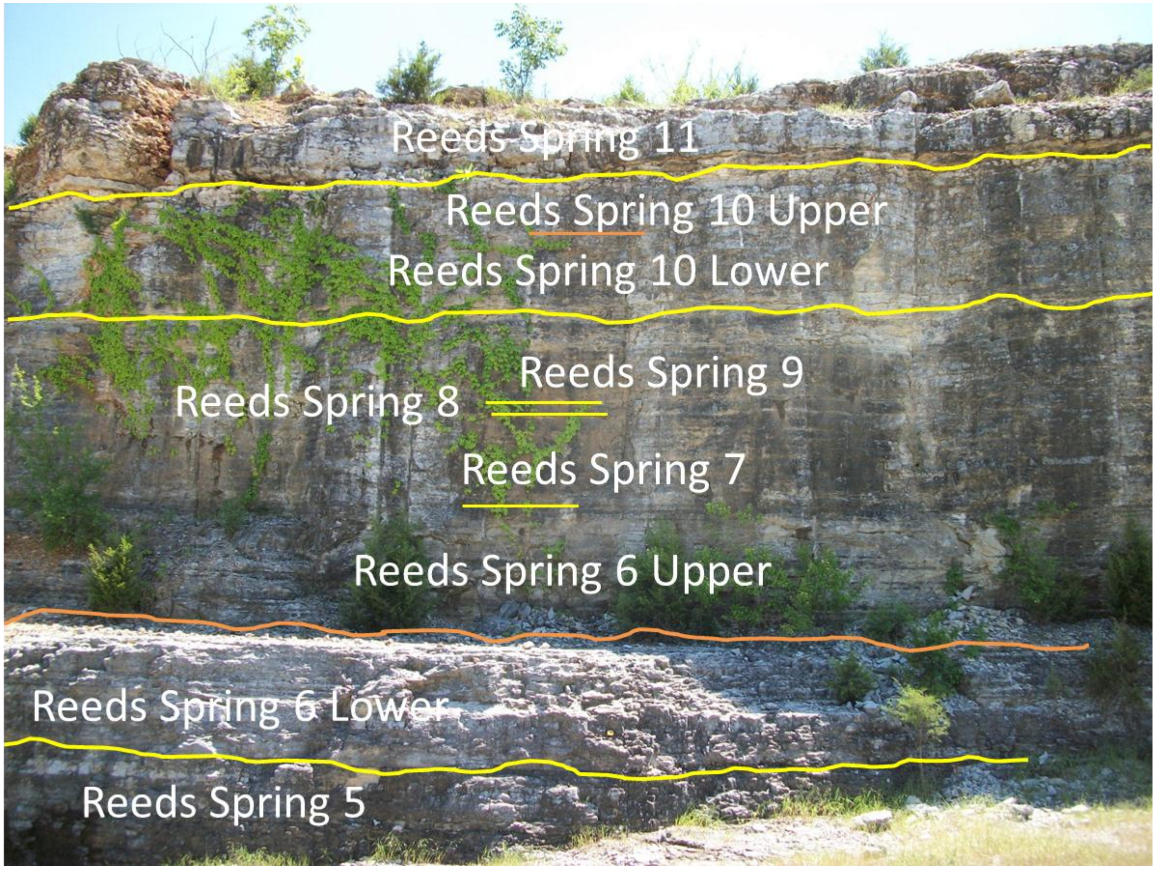

Figure 4.37. The middle of the Reeds Spring Formation in the study area. The continuous red line represents the separation between bedsets. The short yellow line also represents the separation between bedsets that can't be distinguished in this picture. Orange lines separate upper and lower parts of bedsets.

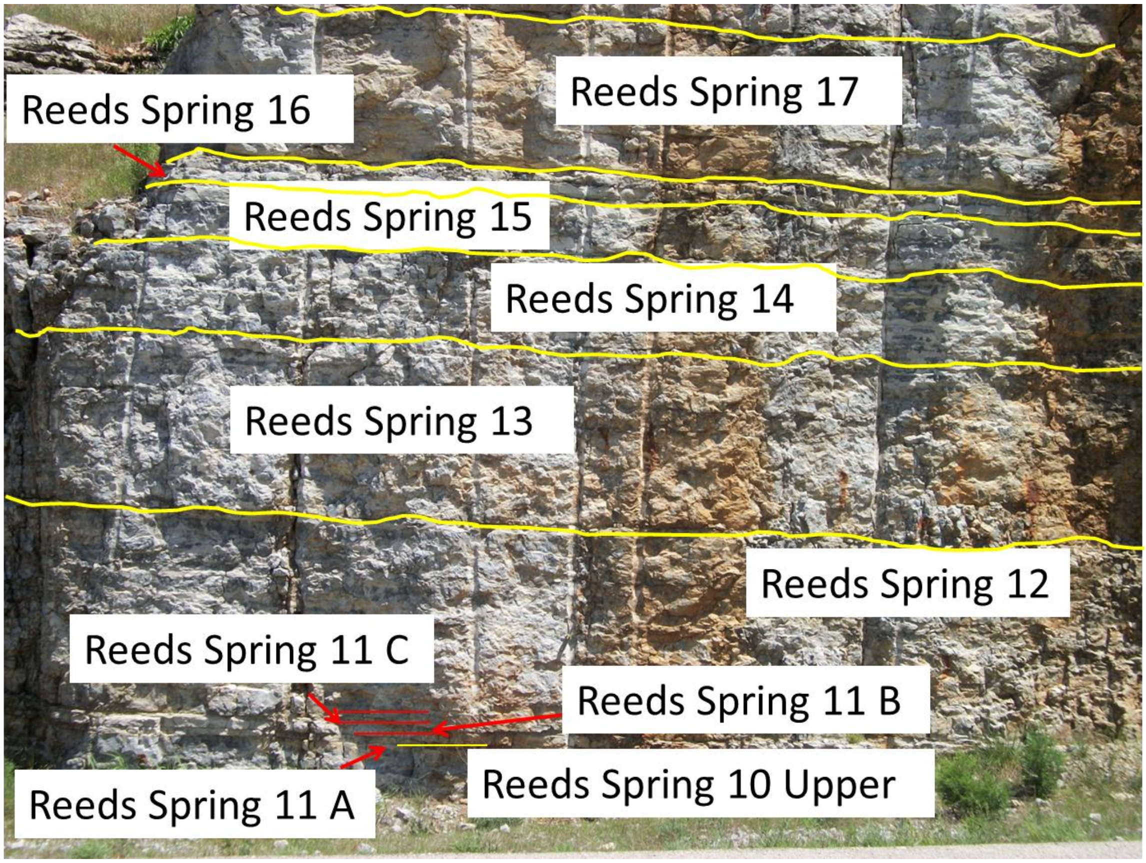

Figure 4.38. The middle of the Reeds Spring Formation in the study area. The continuous yellow line represents the separation between bedsets. The short yellow line represents the separation between bedsets that can't be seen to trace. The short red lines represent the separation between beds.

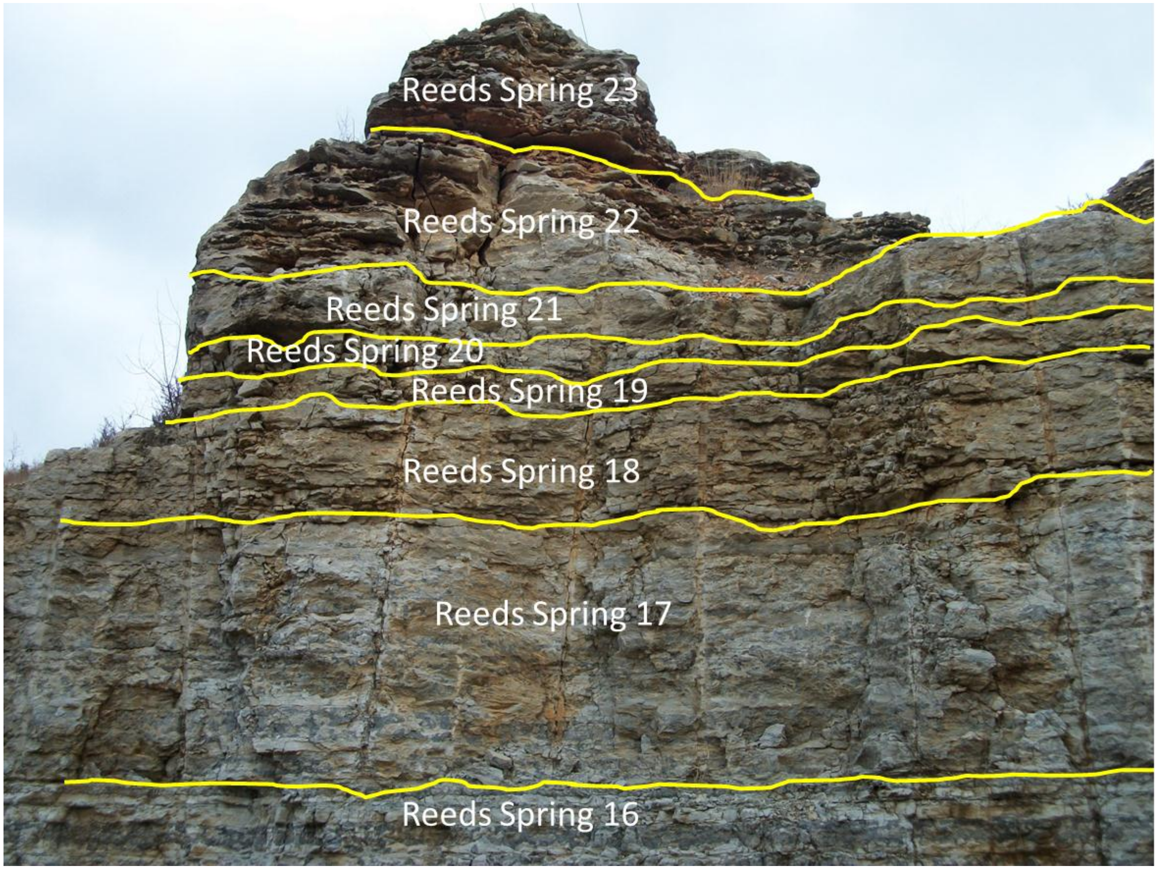

Figure 4.39. The top of the Reeds Spring Formation in the study area. The continuous yellow line represents the separation between bedsets.

Petrographic Analysis:

Although the total thickness of the Reeds Spring Formation was measured, petrographic evaluation was undertaken only immediately above the Pierson Limestone. Two beds, the RS1B and RS1D, at the base of the Reeds Spring Formation were selected for petrographic analysis to reinforce the Pierson Limestone and Reeds Spring Formation boundary as determined in the field. The Pierson Limestone and Reeds Spring Formation boundary was marked by shale at the base of the Reeds Spring. RS1B is crinoidal mudstone-wackestone with intraparticle blocky calcite. Following RS1B is a shale parting that leads into RS1D. RS1D is a mudstone that has some intraparticle and interparticle blocky calcite with spicules being the main bioclast.

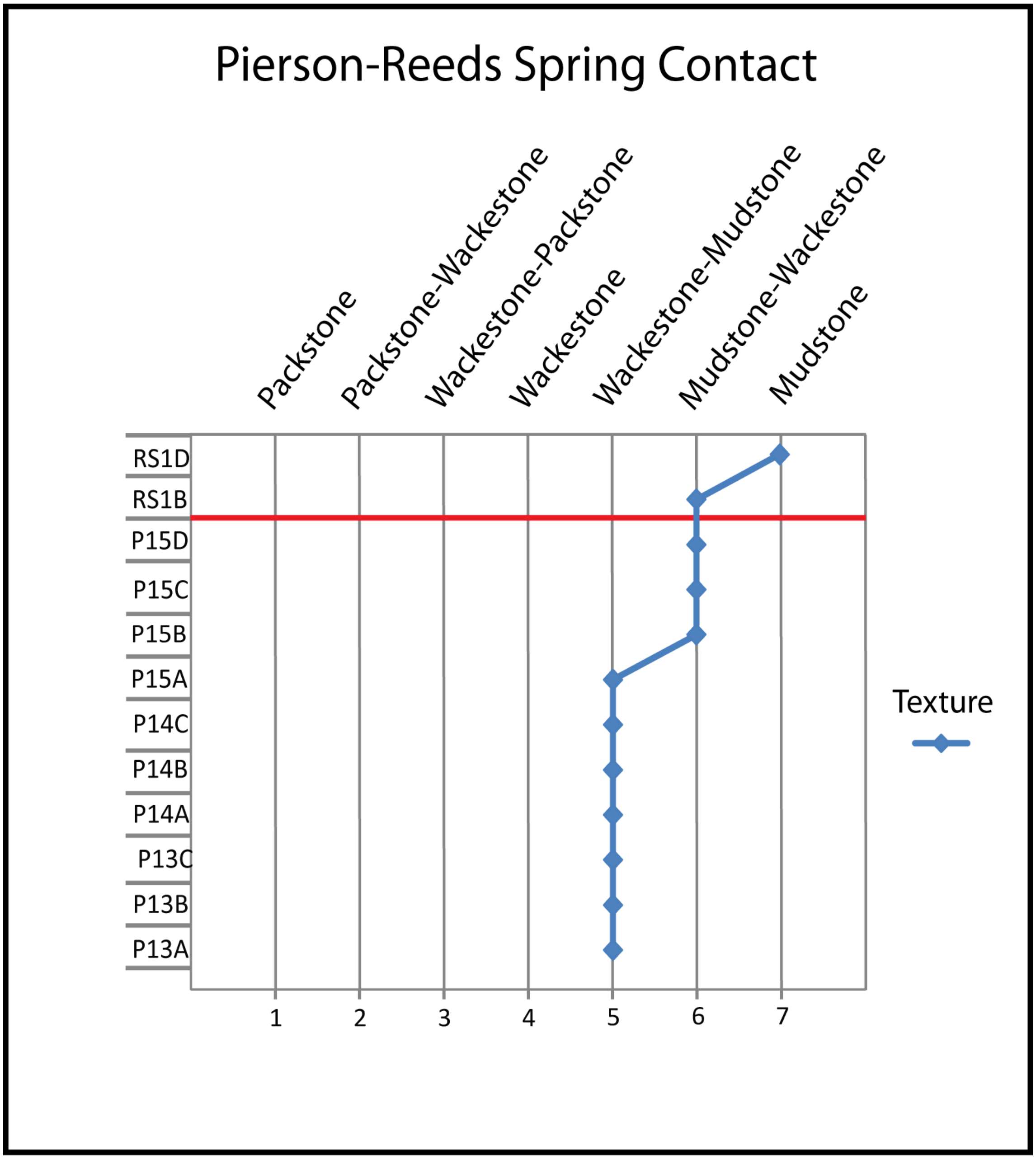

Figure 4.40. Petrographic texture chart showing slight textural change across the contact betwwen the Pierson Limestone and the Reeds Spring Formation.

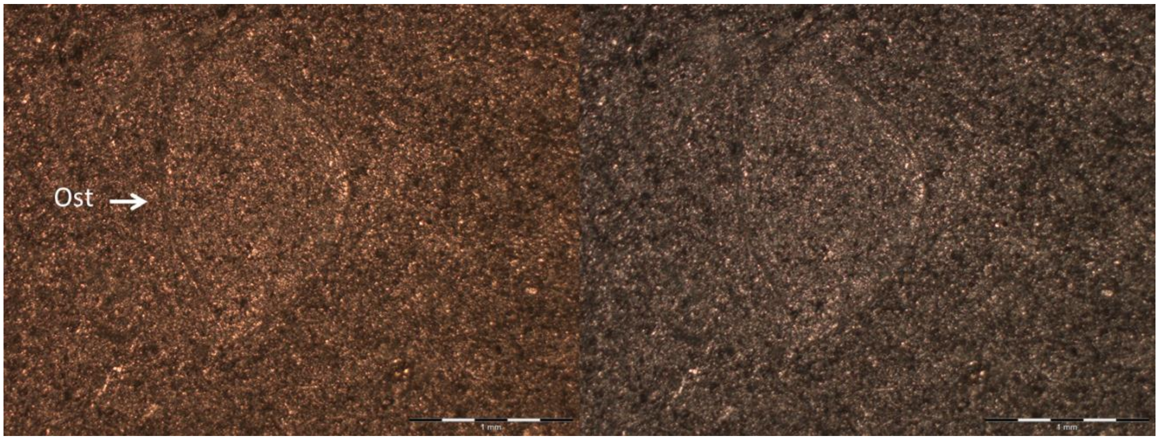

Figure 4.41. Bed RS1B is mudstone to wackestone containing an ostracod (Ost). Left (PPL). Right (CPL).

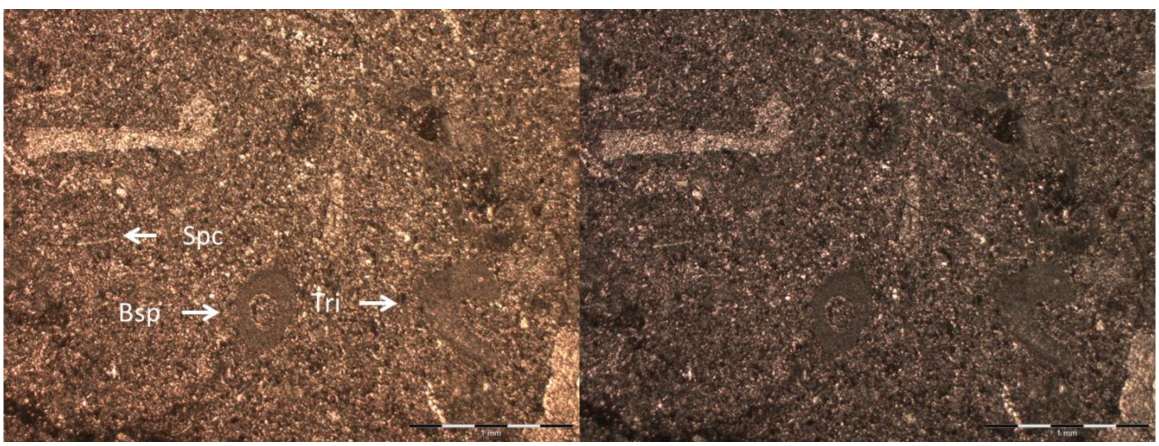

Figure 4.42. Bed RS1D is mudstone. Bioclast include spicules (Spc) brachiopod spines (Bsp) and trilobites (Tri). Left (PPL). Right (CPL).

Dolomite

Petrographic analysis revealed dolomite throughout the Branson north outcrop in varying amounts. Most dolomite was evident in the Northview Formation and the lower beds of the Pierson Limestone up through bed P4A. Dolomite consists of clear euhedral crystals approximately 0.05-0.15 mm in length occuring in the carbonate matrix, as intraparticle crystals in bryozoa, in shale partings, and possibly partial porosity occluding in partially dissolved fossils. Dolomitization models were studied to determine a plausible dolomitization explanation for the dolomite in this outcrop.

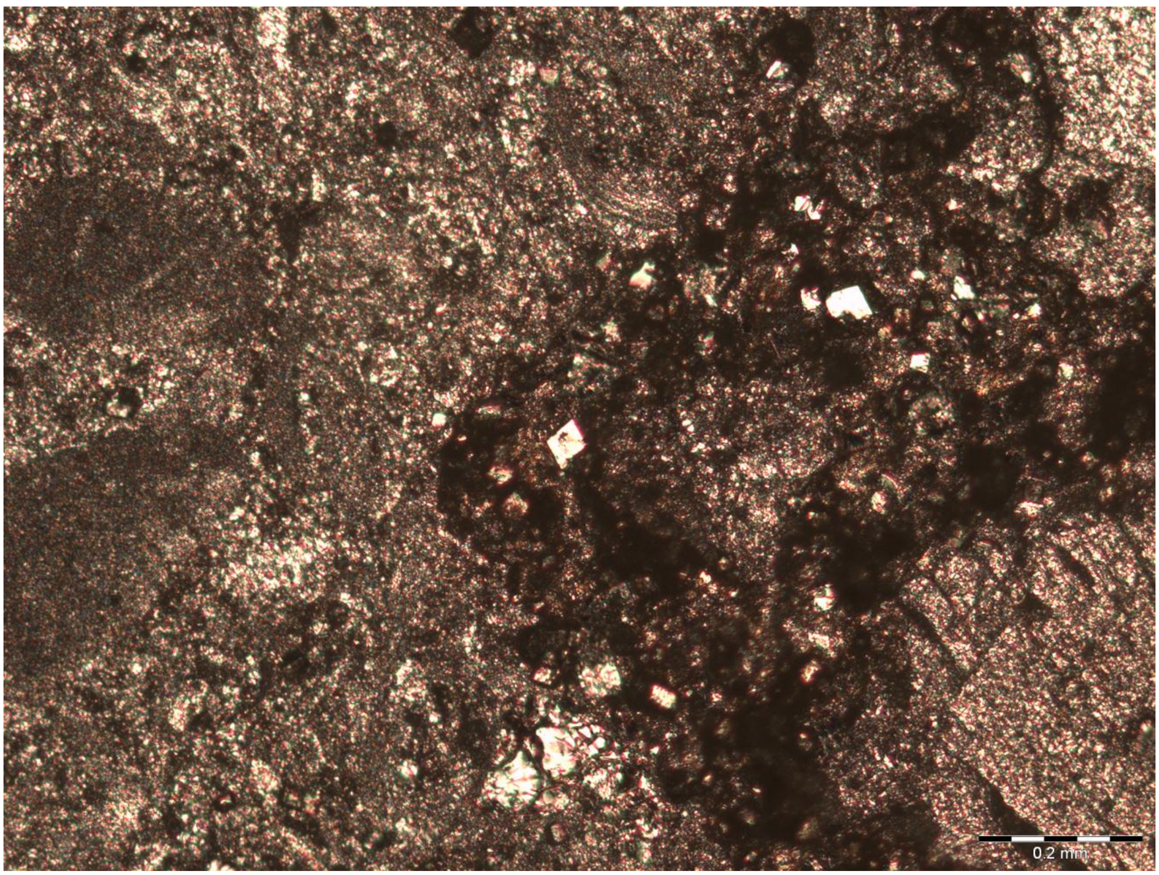

Figure 4.43. Euhedral dolomite that is typical of the dolomite found in the Northview Formation and the lower part of the Pierson Limestone. Pierson bed P3B. PPL

Dolomitization models of carbonate sediments can be divided into five categories: evaporitic (sabkha), seepage—reflux, meteoric—marine mixing, burial, and seawater models (Tucker and Wright 2008).

Evaporative Dolomitization:

"Most dolomites forming at present time are in evaporitic environments" (Tucker and Wright 2008). Modern environments include: high intertidal-supratidal sediments of sabkhas, coastal evaporitic lakes, saline lakes, and hypersaline lagoons. Water is mainly supplied by flood recharge which leads to a short lived downward movement of water through the sediments which join a net seaward flow of groundwater. Dolomite occurs in areas with seasonal to rare flood recharge. In these areas capillary evaporation and evaporative pumping are important. More intense dolomitization is associated with areas of former tidal channels. In an evaporitic setting halite, gypsum and anhydrite, are expected as they are common evaporitic minerals.

Seepage-reflux dolomitization:

The seepage-reflux model involves dolomitizing fluids being generated through the evaporation of lagoon water or tidal flat porewater. These fluids then descend into the underlying carbonate sediments (Tucker and Wright 2008). The precipitation of gypsum in the evaporitic shelf would raise the Mg/Ca ratio creating dense and warm, highly alkaline Mg^{2+}-rich hypersaline brines, which move downward and displace the less dense marine porewater.

Mixing-zone dolomitization:

The premise of this model is that a dilute solution will precipitate dolomite easier, so if seawater is mixed with freshwater the Mg/Ca ratio is maintained, but some kinetic obstacles due to the high ionic strength of seawater are removed (Folk and Land 1975). Two key features of this model are that seawater supplies the Mg^{2+} and the dolomitizing solution is pumped through the limestone by active groundwater movement (Tucker and Wright 2008). The meteoric—marine mixing-zone model has been popular for cases where there are no evaporites associated with the dolomites. Groundwater circulation would be more active under a humid climate than an arid climate. This model is proposed for rocks located in the more landward parts of a carbonate platform sequence, and may relate to more porous facies acting as conduits for the groundwater (Tucker and Wright 2008). This model is employed to explain the dolomitization of the Lower Palaeozoic carbonates of the Western Cordillera in Nevada and Utah.

Burial Dolomitization:

Many dolomitic rocks provide evidence for dolomite precipitation during burial, but whether dolomitization can occur in whole carbonate formations at depth is still a matter of debate (Tucker and Wright 2008). This model advocates one main method which is the compactional dewatering of basinal mudrocks and the expulsion Mg^{2+}-rich fluids into adjacent shelf-edge and platform carbonates. Dolomitization should occur more easily at depth, where higher temperatures would diminish some of the kinetic hindrances. Gawthorpe (1987) presented a strong case for burial dolomitization of the Penndleside Limestone, which represents deposition in a carbonate slope environment with a higher percentage of interbedded mudrock. Dolomitization is ascribed to the Mg^{2+}-rich fluids expelled from basinal mudrocks.

Dolomitization can be attributed to warm, basin-derived waters circulating through underlying sandstone and basal carbonates. An example of this is the Cambrian Bonneterre Dolomite in southeast Missouri.

Shallow burial:

"Dolomite formed from dilute solutions is characteristically limpid (euhedral, perfectly clear with plane mirrorlike faces) and is more resistant to solution than ordianary dolomite" (Folk and Land 1975). Dolomite is very difficult to form because of the precise Ca-Mg ordering required (Goldsmith, 1953). In meteoric waters the concentration of ions is much lower and has much less interference in crystal growth caused by lattice impurities. Slow rates of crystallization can form minerals that are close to theoretical equilibrium with the surrounding solution. In the subsurface zone sea water comes into contact with meteoric water and salinity reduction occurs. In this case Mg is supplied by saline waters, but precipitation is permitted only by dilution with fresh water. Abundant Mg should favor fibrous calcite.

Seawater Dolomitization:

The source of Mg^{2+} in this model is seawater and kinetic problems with precipitating dolomite from normal seawater are overcome by either diluting it or evaporating it. Several mechanisms for pumping the dolomitizing fluid through the carbonate sediments exist. Land (1985) suggested that seawater can dolomitize by itself if there is and efficient pumping mechanism through the carbonate sediment. Proposed pumping methods for a carbonate platform include: ocean current pumping, reflux of slightly hypersaline lagoon waters, tidal pumping along shorelines and Kohout convection. One specific example is the deep Enewetak Atoll which contains 0.1-0.2 mm dolomite rhombs with cloudy centers and clear rims. When sparse and scattered , the dolomite rhombs are generally euhedral (Saller 2011).

CHAPTER V

Conclusions

Petrographic analysis of the Compton, Northview, and Pierson carbonates was used in determining the texture of these rocks which is a direct reflection of the energy of the deposition. The energy of deposition was then used to determine the depositional environment of the Lower Mississippian rocks at this location. Five major depositional cycles were found from the bottom of the Compton Limestone to the base of the Reeds Spring Formation (Fig 5.1).

The first depositional cycle begins at the base of the Compton Limestone C1A and extends through C2C. The texture suggest high energy of deposition as this cycle starts with a packstone at the base and slowly deepens with wackestone-packstone texture from C1D to C1F and then shallowing at the top of the cycle. An increase in silt-sized siliciclastics was apparent in mud-rich areas within the matrix and in shale partings.

The second depositional cycle starts at C2D and ends at C7A. This cycle begins and ends with packstone suggesting another high energy environment for deposition. The amount of siliciclastics (silt) is greatly reduced and the deepening is more pronounced in this cycle as it begins with a packstone at C2D and by C3B has changed to wackestones before shallowing again to a packstone at C7A. A small percentage (<1%) of dolomite rhombs first appear in this cycle and occurs primarily in shale partings.

The third major cycle is the thickest of all the cycles extending from C7A to P4. C8 marks the start of silt sized clastics prevalent in the Northview Formation. Dolomite content increases within cycle 3 and can be found in the matrix, within grains, in shale partings, and areas apparently rich in clay. The texture fluctuates from a packstone at the base to a mudstone-wackestone, and wackstone-mudstone throughout the middle of C9A-P1B before shallowing again to wackestone-packstone toward the top of the cycle. The change in texture is indicative of deepening water as opposed to a shallower water environment closer to the shoreline that clastics sometime indicate. This is the first cycle that ends with a texture that is indicative of deepening upward and is interpreted as retrogradational.

The fourth cycle which runs from P4B to P8C contains no apparent evidence of silt clastics and overall dolomite content is much less than cycle 3. Dolomite is apparently absent in beds P5, P7C, P8B, and P8C.

The fifth and final cycle is another retrogradational sequence extending from Pierson bed P8C upward into the base of the Reeds Spring Formation. This cycle starts with a wackestone-packstone texture and slowly deepens to a mudstone-wackestone. The slow deepening from the Pierson Limestone into the Reeds Spring Formation makes this contact transitional. At Branson north the Reeds Spring Formation is separated from the Pierson Limestone by a shale bed that marks the base of the Reeds Spring Formation and is also an important time marker as it contains the *anchoralis* Zone (Boardman and Thompson 2010). Although the last bed of the Pierson Limestone transitions texturally into the Reeds Spring the cycle stops at the contact where the *anchoralis* Zone is identified at this outcrop (Boardman and Thompson 2010).

The overall pattern of the 5 major parasequences is interpreted as a retrogradational sequence starting at the base of the Compton Limestone and extending to the Pierson Limestone/Reeds Spring Formation contact.

Natural gamma-ray spectrometer data was also collected at this site and compared to the texture fluctuations (Fig. 5.1). The gamma-ray data contains two strong deviations to the right indicating high radioactivity; one in the upper shale of the Bachelor Formation and the second in the Northview Formation, which contains two small shale beds. The remaining gamma-ray curve is rather indistinct and appears to give little to no indication of changes that reflect specific rock compositions or inferred depositional environments. This lack of variability in the range of gamma-ray readings justifies the need for thin section petrography to determine the composition of these Lower Mississippian rocks.

The data from this study was compared with data collected at Jane, Missouri (Fig. 5.2) by Shoeia (2012). The Jane outcrop is located 136.8 km (85 miles) west of Branson, Missouri and contains another complete section of the Lower Mississippian. The bedset identified by Shoeia (2012) as Pierson 17 at Jane, Missouri is time equivalent to the top of the Pierson Limestone at Branson north, Missouri and contains the chronostratigraphic *anchoralis* Zone in the shale at the base of the overlying Reeds Spring Formation (Boardman and Thompson 2010). The Lower Mississippian at Jane, Missouri has an overall grainier texture than the Lower Mississippian carbonates at Branson north. The grainiest texture evident at Branson north is packstone, whereas the grainiest texture observed at Jane was grainstone (Shoeia 2012). The higher energy texture evident at Jane, Missouri appears to disprove previous models that place this outcrop in a more distal deeper water setting on the shelf margin (Lane and Dekeyser, 1980). Using textural fluctuations five cycles were interpreted within the Lower Mississippian at this outcrop. The Jane, Missouri section contains seven cycles interpreted from textural fluctuation (Shoeia 2012).The 5 cycles at Branson north appear to correlate to cycles at Jane (Fig. 5.3). The Pierson Limestone/Reeds Spring Formation contact at the Branson north outcrop is time equivalent to the bedset Pierson 17 at Jane, Missouri. These textural curves for two units match up perfectly at the end of the fifth cycle (*anchoralis* Zone) (Boardman and Thompson 2010). As the top of the Pierson at Branson north correlates to a position near the base of the upper third of the Pierson at Jane, these units are time transgressive. Individual cycle trends differ due to accommodation at the two locations at time of deposition although the overall retrogradational trend is evident with a deepened sea level.

Extensive petrographic study of the Northview Formation revealed that the contact between the Northview Formation and the underlying Compton Limestone and the contact at the top of the Northview Formation and overlying Pierson Limestone are transitional. The top of the Compton Limestone has a mudstone-wackestone texture and this texture persists into the lower two limestone beds of the Northview Formation. A slight textural change occurs in the two limestone beds at the top of the Northview Formation as they apparently shallow to a wackestone-mudstone. The contact of the Northview Formation with the basal bed of the Pierson Limestone shows as slight textural change that is evident in acetate peel: This change is not dramatic, but consists of a transistion from mudstone-wackestone at the top of the Northview Formation to a wackestone-mudstone at the base of the Pierson Limestone. With only a slight textural fluctuation at the Pierson Limestone and Northview Formation contact and no texture change at the Compton Limestone and Northview Formation contact, they are both interpreted as transitional. The findings at this outcrop contradict the common interpretation that the Kinderhookian-Osagean boundary, which is equivalent in age to the Tn2-Tn3 boundary, is a worldwide unconformity (Kammer and Matchen, 2008).

The dolomite crystals observed in rocks at the Branson north outcrop are euhedral and approximately 0.05-0.15 mm in size. Dolomite was found in the matrix, intraparticle porosity of bryozoan fossils, shale partings, and possibly replacing fossils or filling porosity. Fibrous calcite was seen in some of the acetate peels although it was not found in abundance in any of the beds. Two possible models for dolomitization may be applicable based on the observations. The most likely model is that the dolomite was precipitated from seawater as ocean currents pumped water through the carbonate sediment. One such example is the deep Enewetak Atoll, which contains dolomite rhombs ranging from 0.1-0.2 mm in size (Saller 2011). When dolomite crystals are sparse and scattered, as seen in the Branson north rocks, the dolomite rhombs are euhedral. Partial dissolution of calcite bioclasts is observed in the more intensely dolomitized zones of the Enewetak atoll (Saller 2011). Another possibility is the shallow burial model, which explains the precipitation of euhedral crystals and is associated with fibrous calcite. Deep burial seems less likely due to the small size of the dolomite crystals. These two dolomite models represent the most plausible explanation based on the depositional environment and the dolomite morphologies evident in the Branson north rocks. Further investigation of the dolomite in this section is needed before a more conclusive dolomitization model can be established.

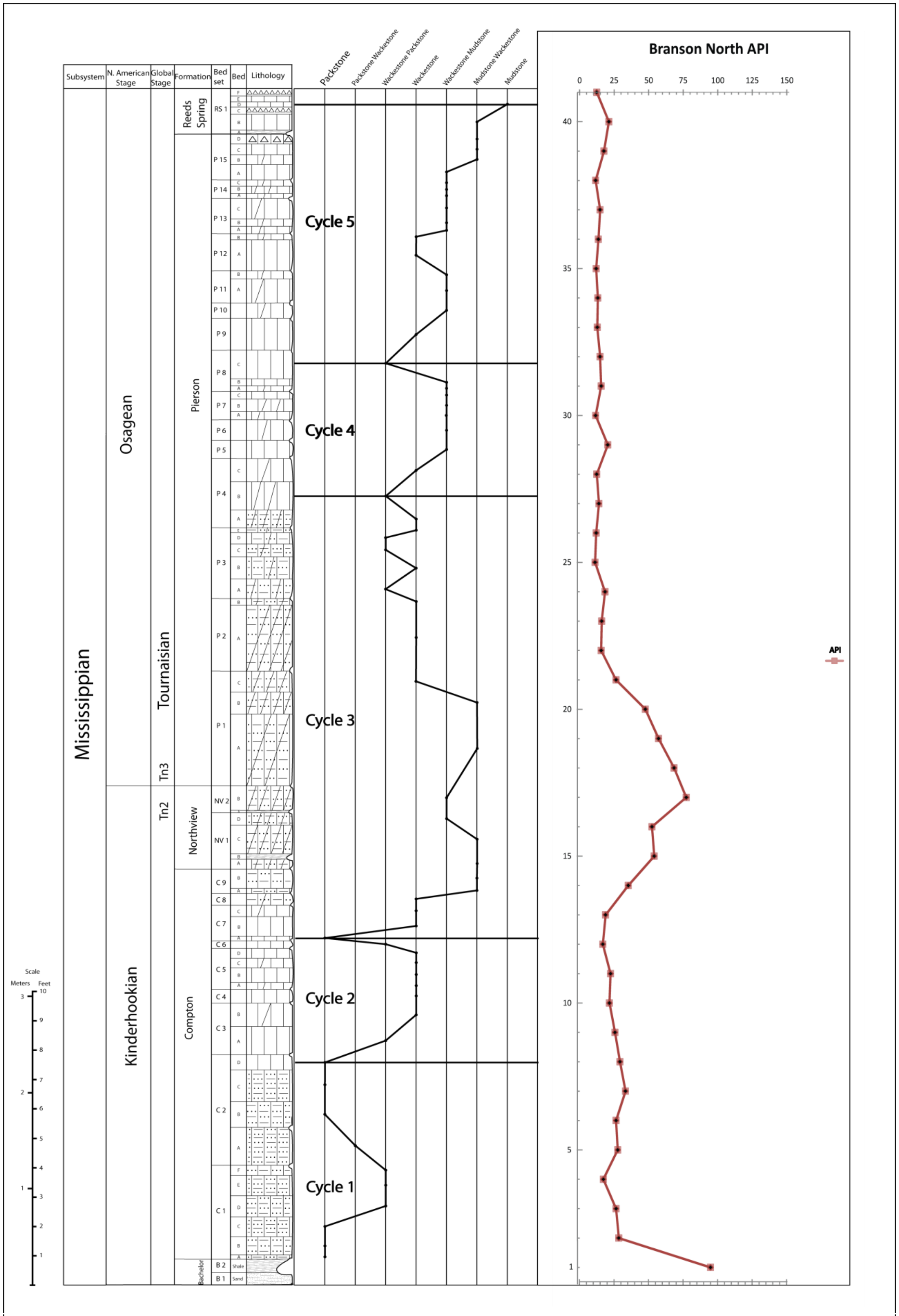

Figure 5.1. Stratigraphic column with textures, interpreted depositional cycles, and total gamma-ray (API units) at the outcrop Bryan (2012).

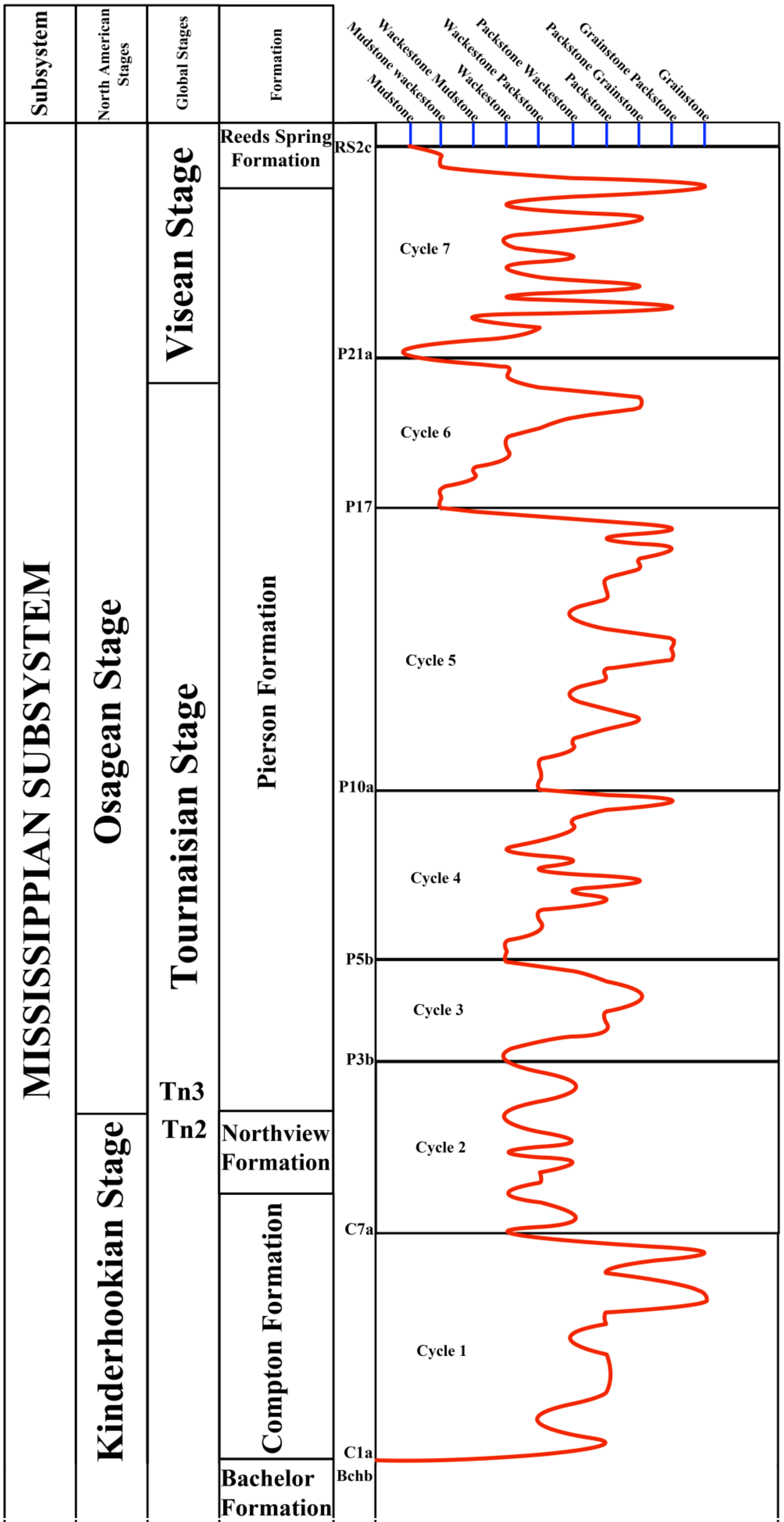

Figure 5.2. Lower Mississippian stratigraphy at Jane, Missouri with corresponding texture and interpreted depositional cycles. Shoeia (2012)

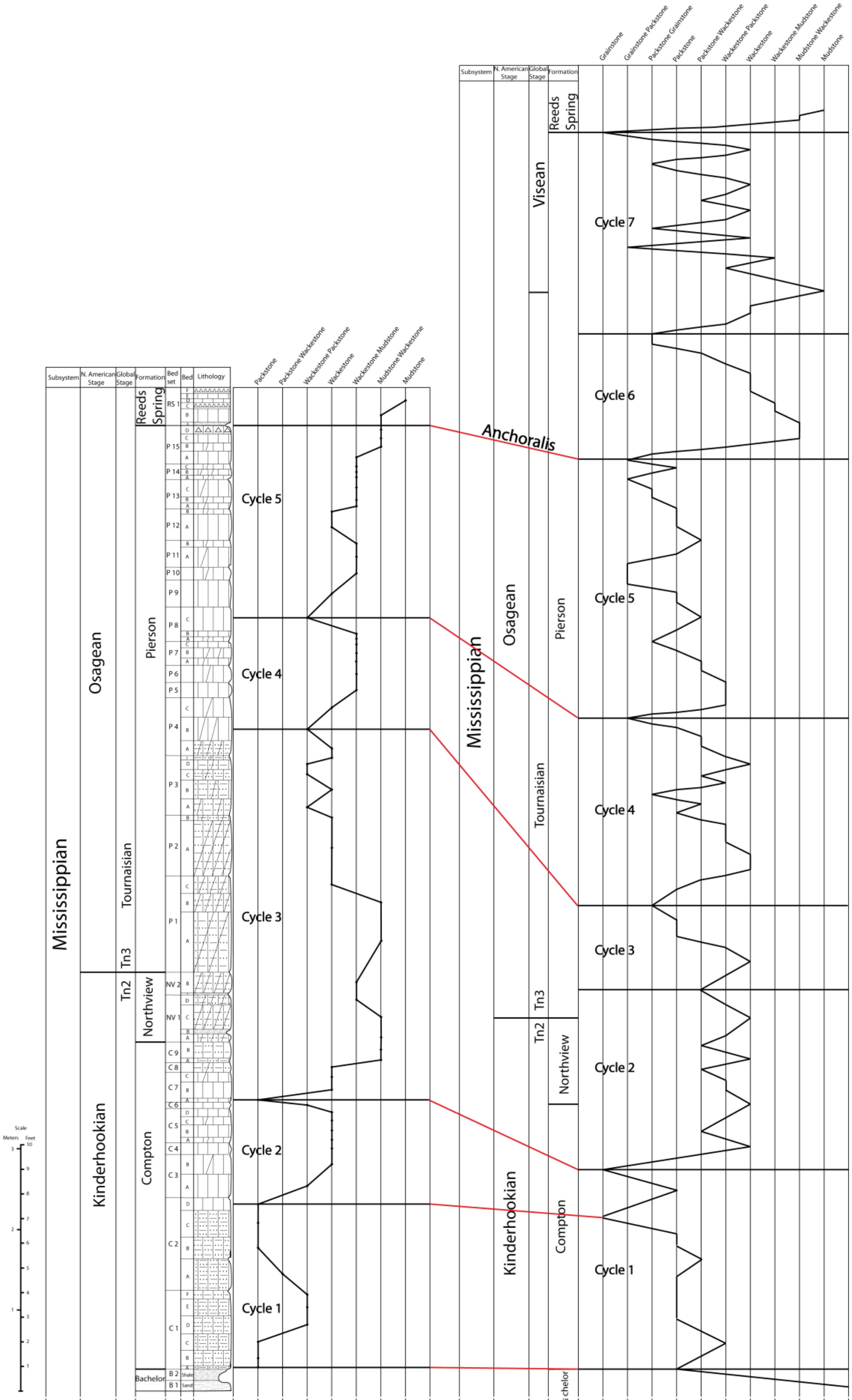

Figure 5.3. Cycle correlation between Branson north, Missouri outcrop (left) and Jane, Missouri outcrop (right). Red lines match cycles interpreted at Branson north to the equivalent cycles at Jane. Red lines are independent of cycles picked at Jane, Missouri by Shoeia (2012).[2+]

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APPPENDICES

Appendix A

This appendix includes descriptions of all the samples examined petrographically from the study area.

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	1
Bed Number	A

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
						X

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
X													X										X	X	X				

Diagenesis

Intraparticle blocky calcite within the bryozoan fossils

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	1
Bed Number	B

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
						X

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
X													X		X								X	X	X				

Diagenesis

Intraparticle blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	1
Bed Number	C

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
						X

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
X													X		X									X	X				

Diagenesis
Intraparticle blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	1
Bed Number	D

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
				X		

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
X													X			X								X	X				

Diagenesis
Blocky calcite and micro calcite cement

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	1
Bed Number	E

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
				X		

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
X													X									X		X	X				

Diagenesis
Intraparticle blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	1
Bed Number	F

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
				X		

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
X													X		X							X		X	X				

Diagenesis
Intraparticle blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	2
Bed Number	A

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
					X	

Non-biotic Constituents					Biotic Constituents																							
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
X													X											X	X				

Diagenesis

Intraparticle blocky calcite, dissolution in grains

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	2
Bed Number	B

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
						X

Non-biotic Constituents					Biotic Constituents																							
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
X													X		X									X	X				

Diagenesis

Intraparticle blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	2
Bed Number	C

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
						X

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other
X				

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods
								X		X		

Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
						X	X				

Diagenesis

Intraparticle blocky calcite, replacement with blocky calcite, dissolution

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	2
Bed Number	D

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
						X

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other
X				

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods
					X			X		X		

Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
				X	X	X	X				

Diagenesis

Intraparticle blocky calcite, minor replacement with blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	3
Bed Number	A

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
				X		

Non-biotic Constituents					Biotic Constituents																												
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
										X			X		X							X		X	X				

Diagenesis

Intraparticle blocky calcite, minor replacement with blocky calcite, geopetal present

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	3
Bed Number	B

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
													X											X	X				

Diagenesis

Intraparticle blocky calcite, dolomite present in mudstone intraclast

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	4
Bed Number	

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X		X								X	X	X				

Diagenesis

Intraparticle and interparticle blocky calcite, dissolution of grains

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	5
Bed Number	A

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X		X								X	X	X				

Diagenesis

Intraparticle blocky calcite, interparticle dolomite rhombs

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	5
Bed Number	B

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
										X			X		X								X	X	X				

Diagenesis

Intraparticle blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	5
Bed Number	C

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
													X		X								X	X	X				

Diagenesis

Intraparticle blocky calcite, crinoids with calcite replacement, blocky calcite in shale partings, dolomite rhombs present

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	5
Bed Number	D

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents					Biotic Constituents																									
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
										X			X		X								X	X	X				

Diagenesis

Sparse intraparticle blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	6
Bed Number	

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
				X		

Non-biotic Constituents					Biotic Constituents																									
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
										X			X		X								X	X	X				

Diagenesis

Intraparticle blocky calcite, grain dissolution, overgrowth cements

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	7
Bed Number	A

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
						X

Non-biotic Constituents					Biotic Constituents																									
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
													X		X								X	X	X				

Diagenesis

Intraparticle blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	7
Bed Number	B

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents					Biotic Constituents																									
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
													X		X									X	X				

Diagenesis

Intraparticle and interparticle blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	7
Bed Number	C

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
										X			X		X									X	X				

Diagenesis

Intraparticle blocky calcite, minor calcite replacement, dolomite present in minor amount

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	8
Bed Number	

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
X													X											X	X				

Diagenesis

Interparticle blocky calcite, dolomite present in minor amount

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	9
Bed Number	A

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
	X					

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
X													X											X	X				

Diagenesis

Locality	Branson North Taney County, SW Missouri
Formation	Compton
Member	
Bed Set Number	9
Bed Number	B

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
	X					

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
X													X											X	X				

Diagenesis
Intraparticle blocky calcite, minor calcite replacement in bioclast

Locality	Branson North Taney County, SW Missouri
Formation	Northview
Member	
Bed Set Number	1
Bed Number	A

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
	X					

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other
X				

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
								X		X									X	X				

Diagenesis

Minor intraparticle blocky calcite, dolomitic

Locality	Branson North Taney County, SW Missouri
Formation	Northview
Member	
Bed Set Number	1
Bed Number	C

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
	X					

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other
X				

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
								X											X	X				

Diagenesis

Dolomitic

Locality	Branson North Taney County, SW Missouri
Formation	Northview
Member	
Bed Set Number	1
Bed Number	D

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other
X				

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
								X											X	X				

Diagenesis

Dolomitic

Locality	Branson North Taney County, SW Missouri
Formation	Northview
Member	
Bed Set Number	2
Bed Number	B

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other
X				

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
								X											X	X				

Diagenesis

Intraparticle blocky calcite, dolomitic

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	1
Bed Number	A

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
	X					

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other
X				

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
								X										X	X	X				

Diagenesis

Dolomitic

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	1
Bed Number	B

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other
X				

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X										X	X	X				

Diagenesis

Intraparticle and interparticle blocky calcite, dolomitized, some replacement with blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	1
Bed Number	C

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other
X				

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
			X					X									X		X	X				

Diagenesis

Intraparticle blocky calcite, dolomitized, minor replacement with blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	2
Bed Number	A

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other
X				

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X		X								X	X	X				

Diagenesis

Fibrous calcite, dolomitized, some calcite and dolomite replacement, minor dissolution

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	2
Bed Number	B

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other
X				

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
			X		X					X									X	X				

Diagenesis

Intraparticle and interparticle blocky calcite, dolomitic

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	3
Bed Number	A

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
				X		

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other
X				

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X									X	X	X	X				

Diagenesis

Intraparticle blocky calcite, dolomite present in matrix and shale partings, some calcite replacement

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	3
Bed Number	B

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents					Biotic Constituents																									
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
X										X			X		X								X	X	X				

Diagenesis

Dolomite in muddy areas

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	3
Bed Number	C

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
				X		

Non-biotic Constituents					Biotic Constituents																									
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
X										X			X		X								X	X	X				

Diagenesis

Intraparticle blocky calcite, dolomite in muddy areas and shale partings

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	3
Bed Number	D

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
				X		

Non-biotic Constituents					Biotic Constituents																									
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
X										X			X		X								X	X	X				

Diagenesis

Minor fibrous calcite, intraparticle blocky calcite, minute dolomite in matrix

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	3
Bed Number	E

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents					Biotic Constituents																									
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
X										X			X		X								X	X	X				

Diagenesis

Intraparticle calcite, abundant calcite in matrix, dolomite in shale partings, calcite replacement

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	4
Bed Number	A

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other
X				

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X		X								X	X	X				

Diagenesis

Intraparticle and interparticle calcite, dolomitized

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	4
Bed Number	B

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
				X		

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other
X				

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X		X								X	X	X				

Diagenesis

Intraparticle calcite, dolomite present

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	4
Bed Number	C

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
										X			X		X							X	X	X	X				

Diagenesis
Intraparticle calcite, dolomite present in small amount

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	5
Bed Number	

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
										X			X		X								X	X	X				

Diagenesis
Interparticle calcite

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	6
Bed Number	

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents					Biotic Constituents																									
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
										X			X		X								X	X	X				

Diagenesis

Interparticle and intraparticle calcite, fibrous calcite replaced fossil, dolomite present

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	7
Bed Number	A

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents					Biotic Constituents																									
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
										X			X		X								X	X	X				

Diagenesis

Blocky calcite in shale partings, minute dolomite

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	7
Bed Number	B

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X		X								X	X	X				

Diagenesis

Intraparticle and interparticle blocky calcite, minor dissolution, dolomite in matrix

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	7
Bed Number	C

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X									X	X	X	X				

Diagenesis

Intraparticle and interparticle blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	8
Bed Number	A

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X										X	X	X				

Diagenesis

Intraparticle and interparticle blocky calcite, minute dolomite

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	8
Bed Number	B

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X										X	X	X				

Diagenesis

Intraparticle and interparticle blocky calcite, minor calcite replacement occuring

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	8
Bed Number	C

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
				X		

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
										X					X								X	X	X				

Diagenesis
Intraparticle and interparticle blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	9
Bed Number	

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
										X			X		X								X	X	X				

Diagenesis
Intraparticle blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	10
Bed Number	

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X										X	X	X				

Diagenesis

Intraparticle and interparticle blocky calcite, dolomite present

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	11
Bed Number	A

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X		X								X	X	X				

Diagenesis

Intraparticle and interparticle blocky calcite, dolomite present

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	11
Bed Number	B

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X		X								X	X	X				

Diagenesis

Intraparticle and interparticle blocky calcite, dolomite present

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	12
Bed Number	A

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
								X		X							X	X	X	X				

Diagenesis

Intraparticle and interparticle blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	12
Bed Number	B

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
			X			

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods
					X			X				

Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X	X	X				

Diagenesis

Intraparticle and interparticle blocky calcite, minute dolomite

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	13
Bed Number	A

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods
					X			X		X		

Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X	X	X				

Diagenesis

Intraparticle blocky calcite, minute dolomite

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	13
Bed Number	B

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X		X								X	X	X				

Diagenesis

Intraparticle blocky calcite, minute dolomite

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	13
Bed Number	C

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X		X								X	X	X				

Diagenesis

Intraparticle blocky calcite, minute dolomite

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	14
Bed Number	A

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents / **Biotic Constituents**

Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
										X			X										X	X	X				

Diagenesis

Intraparticle blocky calcite, minute dolomite

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	14
Bed Number	B

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents / **Biotic Constituents**

Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
X										X			X										X	X	X				

Diagenesis

Intraparticle blocky calcite, minute dolomite

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	14
Bed Number	C

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
										X			X		X								X	X	X				

Diagenesis
Intraparticle blocky calcite, minute dolomite

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	15
Bed Number	A

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
		X				

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
										X			X		X								X	X	X				

Diagenesis
Intraparticle blocky calcite, some dissolution of grains

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	15
Bed Number	B

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
	X					

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other
X				

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X										X	X	X				

Diagenesis

Intraparticle blocky calcite and dolomite, some dissolution of grains

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	15
Bed Number	C

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
	X					

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X										X	X	X				

Diagenesis

Intraparticle blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Pierson
Member	
Bed Set Number	15
Bed Number	D

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
	X					

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X									X	X	X	X				

Diagenesis

Intraparticle blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Reeds Spring
Member	
Bed Set Number	1
Bed Number	B

Textural Classification (Dunham)

Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
	X					

Non-biotic Constituents

Siliciclastics	Ooids	Pisoids	Grapestone	Other

Biotic Constituents

Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
					X			X		X								X	X	X				

Diagenesis

Intraparticle blocky calcite

Locality	Branson North Taney County, SW Missouri
Formation	Reeds Spring
Member	
Bed Set Number	1
Bed Number	D

Textural Classification (Dunham)						
Mudstone	Mudstone-Wackestone	Wackestone-Mudstone	Wackestone	Wackestone-Packstone	Packstone-Wackestone	Packstone
X						

Non-biotic Constituents					Biotic Constituents																								
Siliciclastics	Ooids	Pisoids	Grapestone	Other	Coated Grains	Oncolites	Fusulinids	Forams	Radiolarians	Spicules	Rugose Corals	Tabulate Corals	Fenestrate Bryozoans	Ramose Bryozoans	Inarticulate Brachiopods	Articulate Brachiopods	Gastropods	Bivalves	Scaphopods	Cephalopods	Annelids	Ostracodes	Trilobites	Echinoderms	Crinoids	Echinoids	Holothurians	Vertebrate Debris	Other
										X			X		X								X	X	X				

Diagenesis

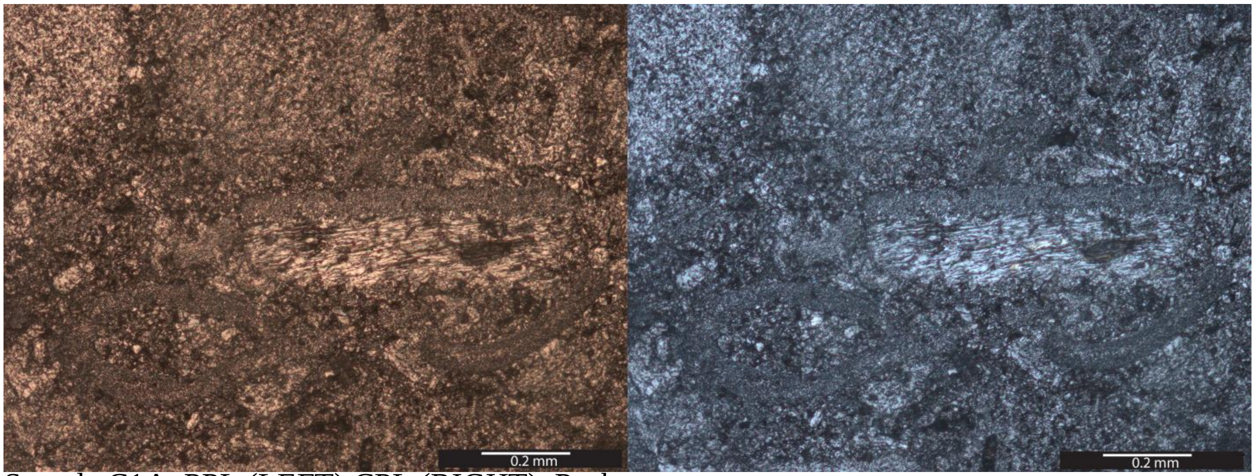
Intraparticle and interparticle blocky calcite

APENDIX B

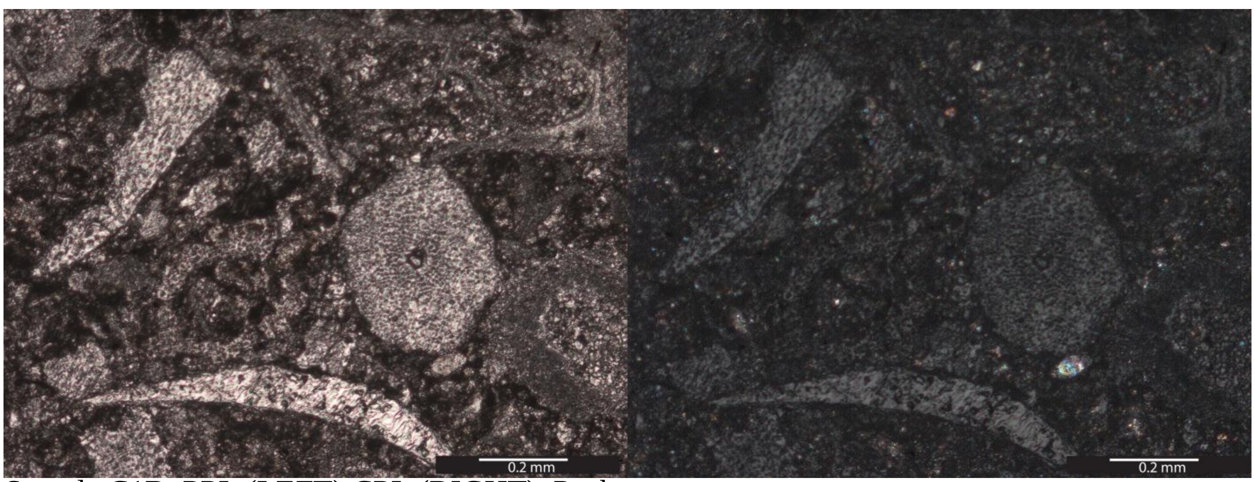
This appendix includes petrographic photos of all the collected samples. All figures include both PPL (Plane Polarized Light) and CPL (Cross Polarized Light) images of the samples.

The sample's names are abbreviated and can be deciphered as follows:

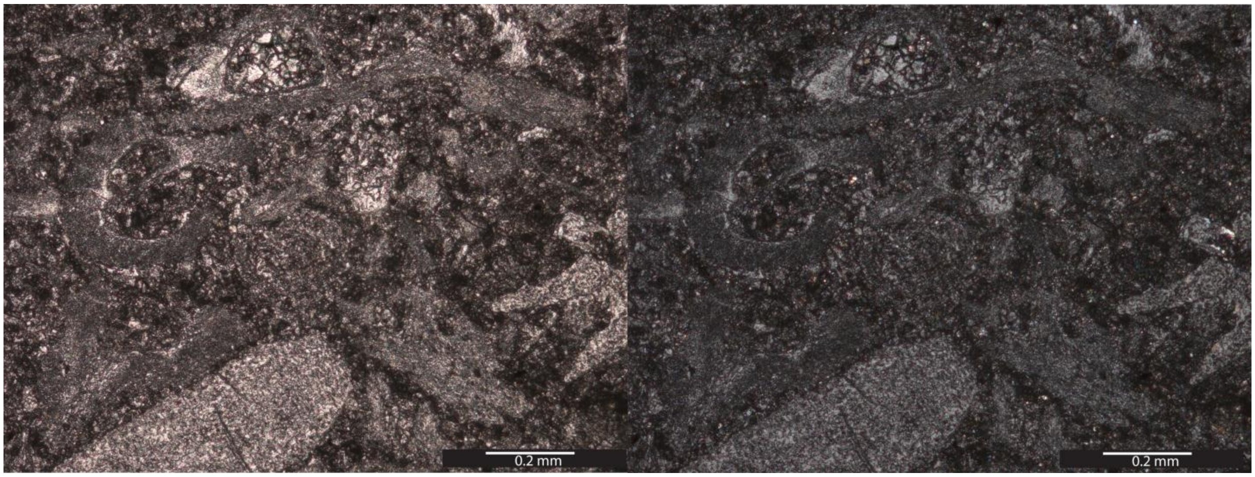
The Compton Limestone is abbreviated as (C), the Northview Formation is (NV), the Pierson Limestone is designated by the letter (P), and lastly the Reeds Spring Formation is abbreviated as (RS). By using the abbreviation along with numbers and letters you know what formation, bedset, and bed you are in. For example, (C1A) refers to bed A of the first bedset of the Compton Limestone.



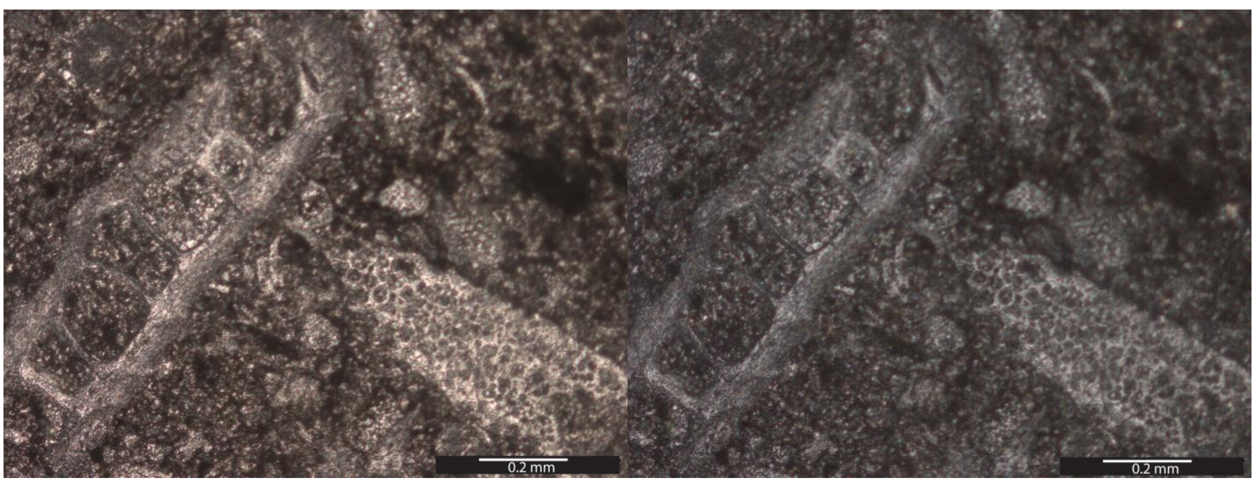
Sample C1A, PPL (LEFT) CPL (RIGHT), Packstone.



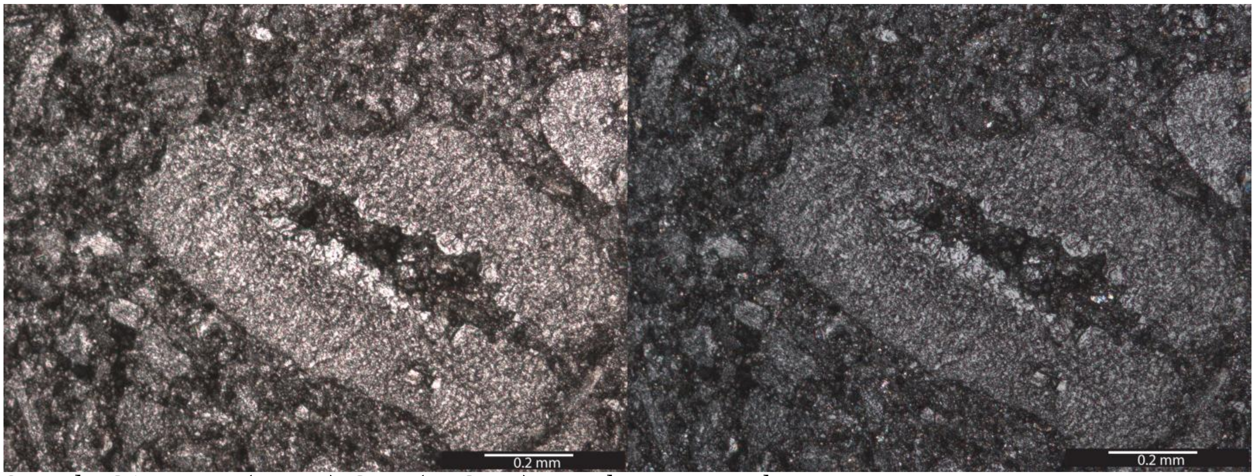
Sample C1B, PPL (LEFT) CPL (RIGHT), Packstone.



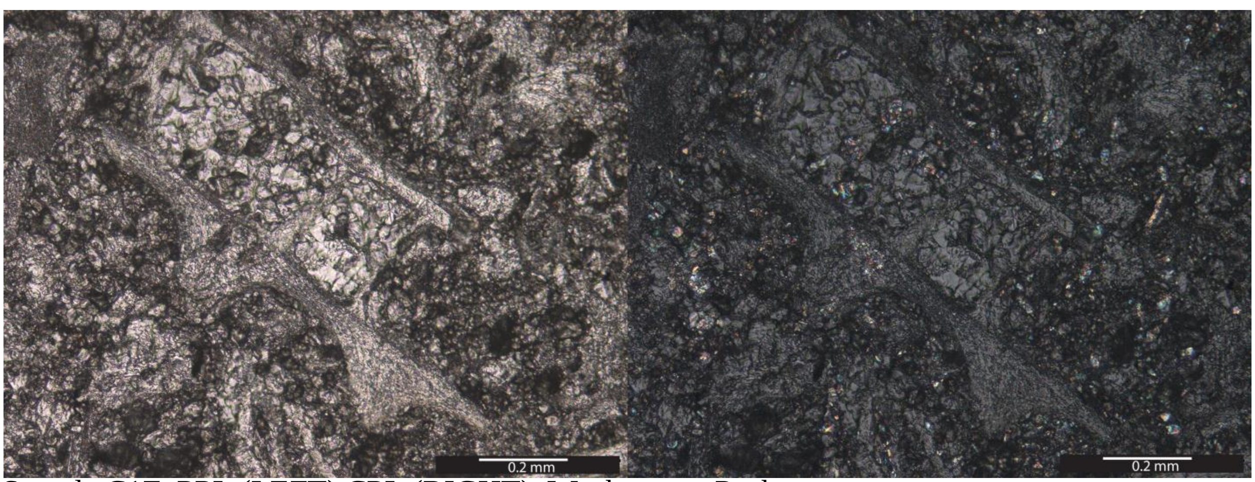
Sample C1C, PPL (LEFT) CPL (RIGHT), Packstone.



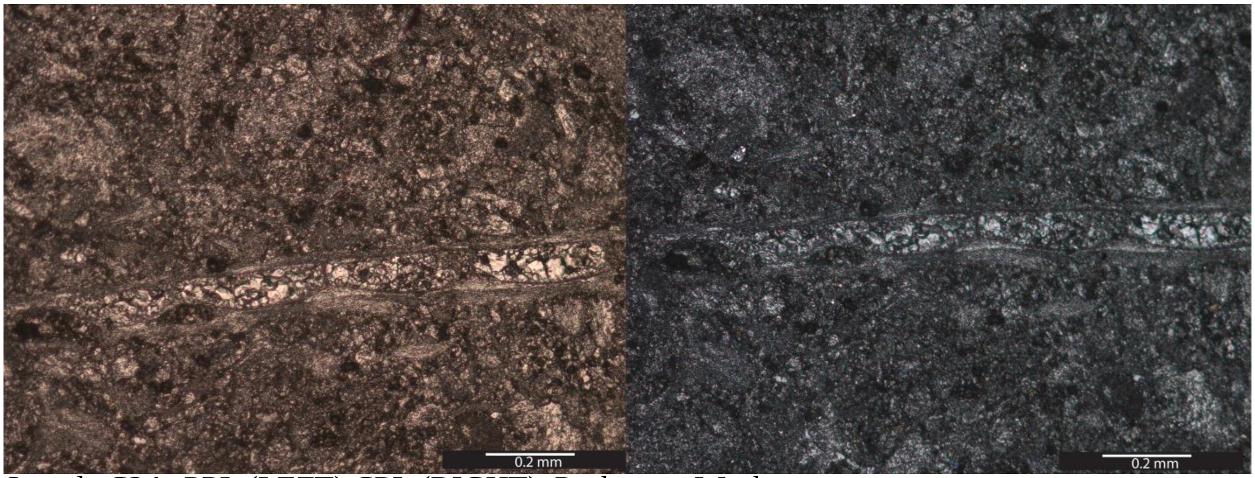
Sample C1D, PPL (LEFT) CPL (RIGHT), Wackestone-Packstone.



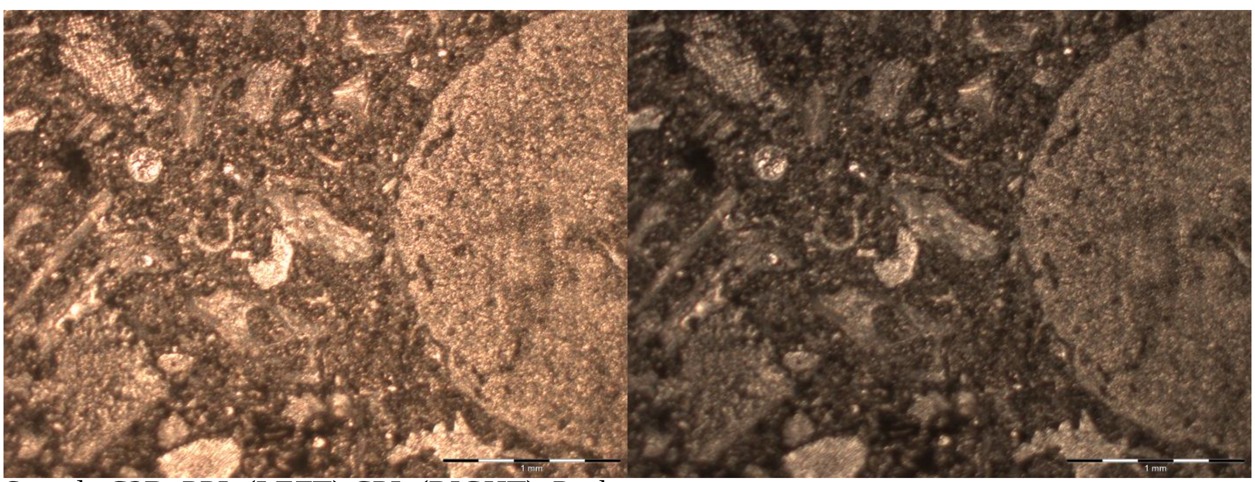
Sample C1E, PPL (LEFT) CPL (RIGHT), Wackestone-Packstone.

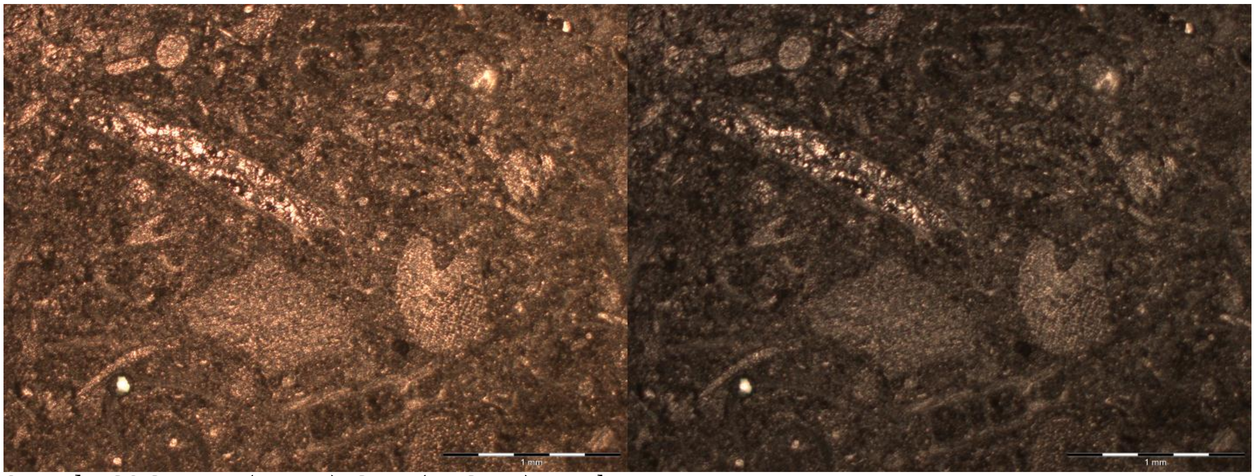


Sample C1F, PPL (LEFT) CPL (RIGHT), Wackestone-Packstone.

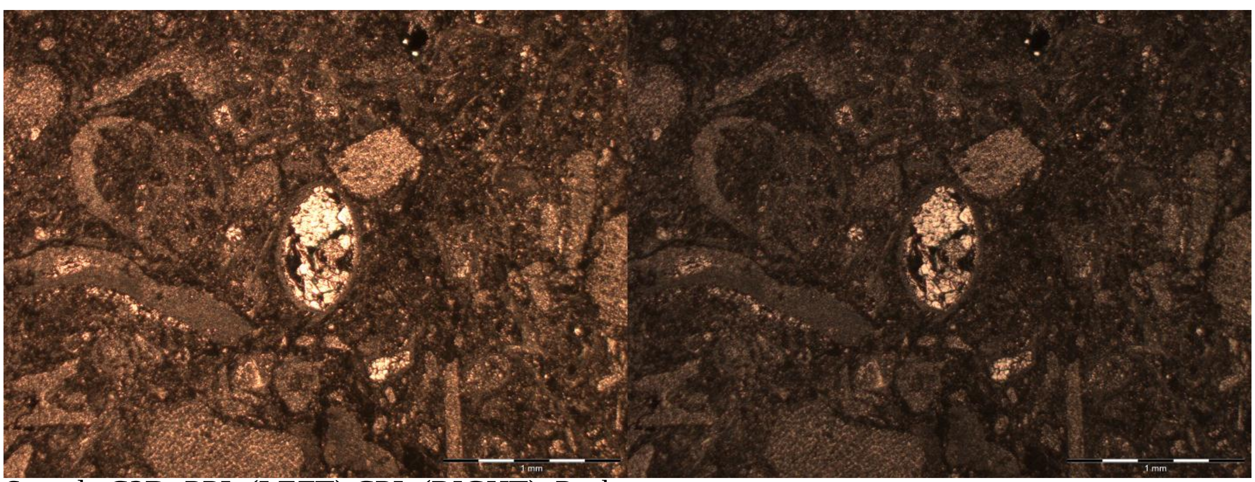


Sample C2A, PPL (LEFT) CPL (RIGHT), Packstone-Wackestone.

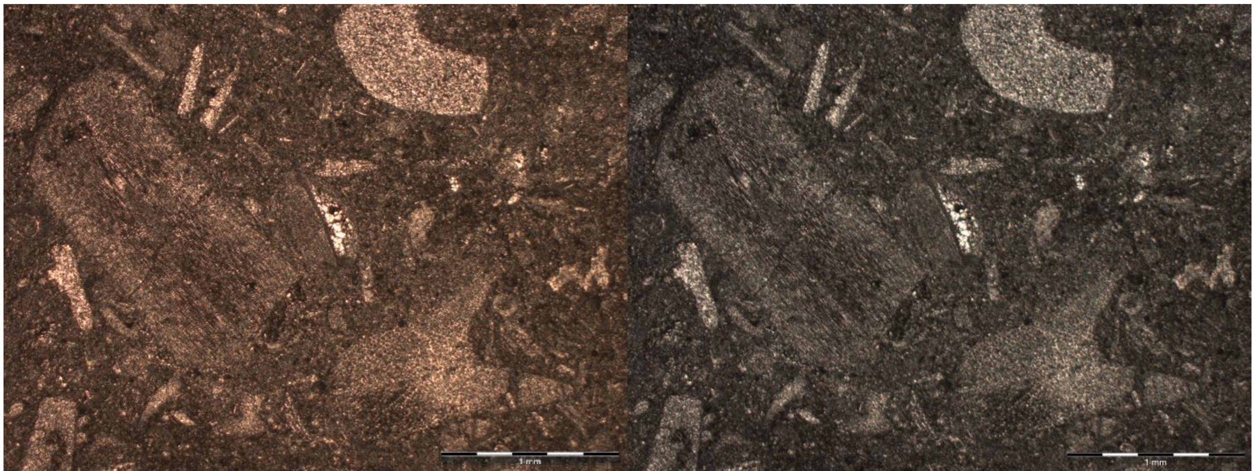

Sample C2B, PPL (LEFT) CPL (RIGHT), Packstone.



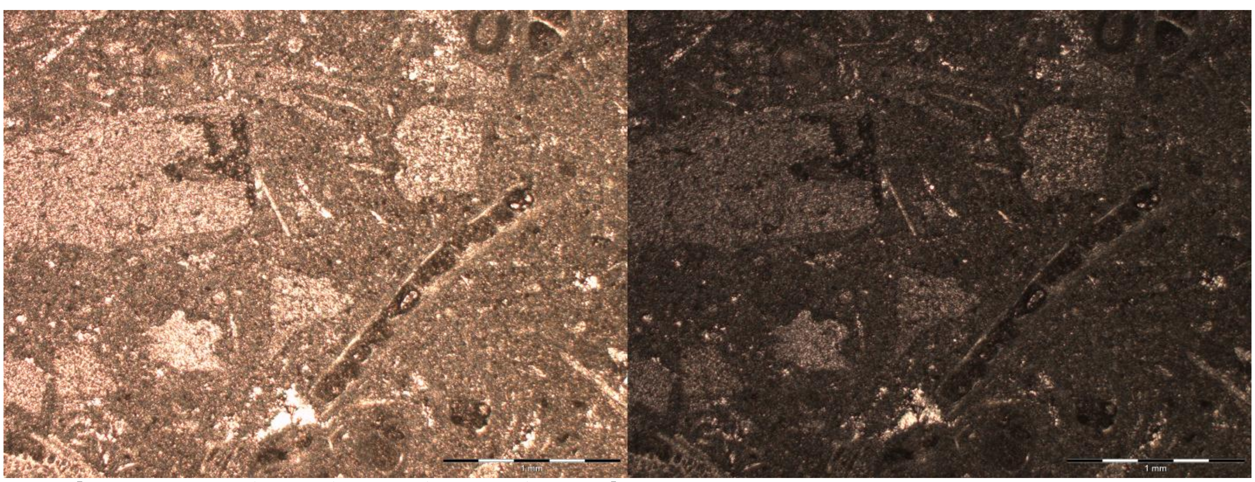
Sample C2C, PPL (LEFT) CPL (RIGHT), Packstone.



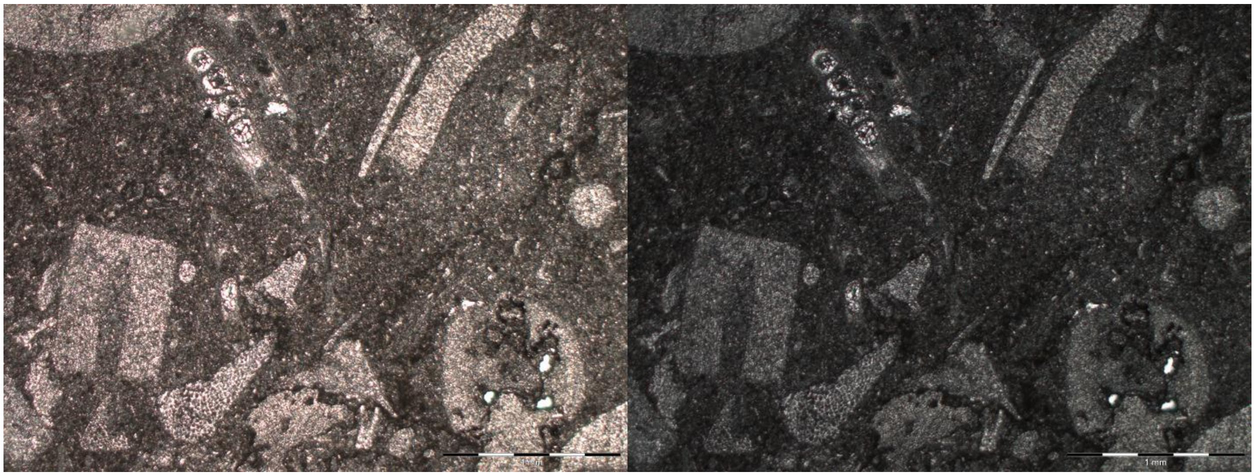
Sample C2D, PPL (LEFT) CPL (RIGHT), Packstone.



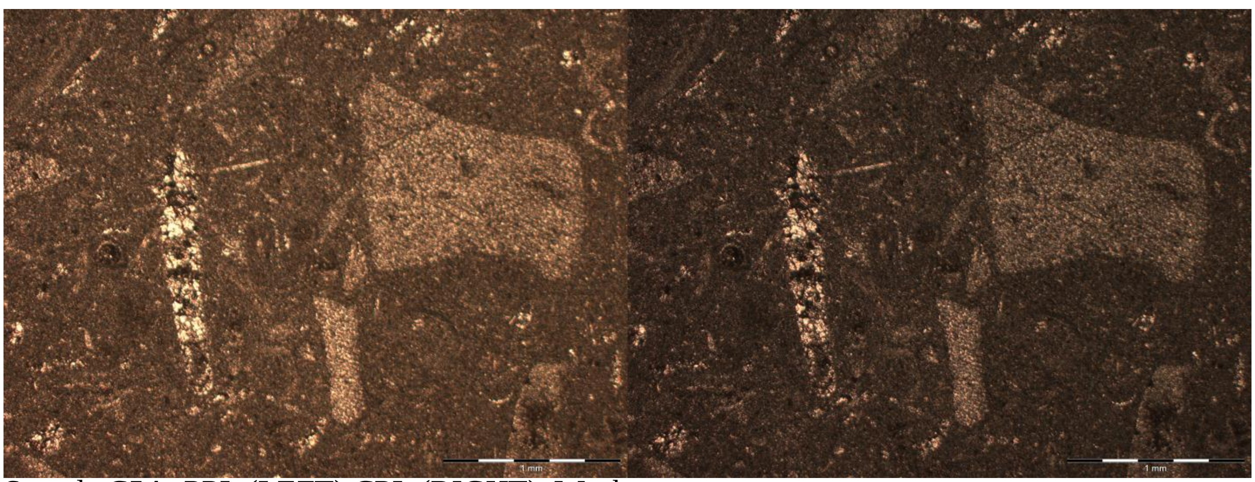
Sample C3A, PPL (LEFT) CPL (RIGHT), Wackestone-Packstone.



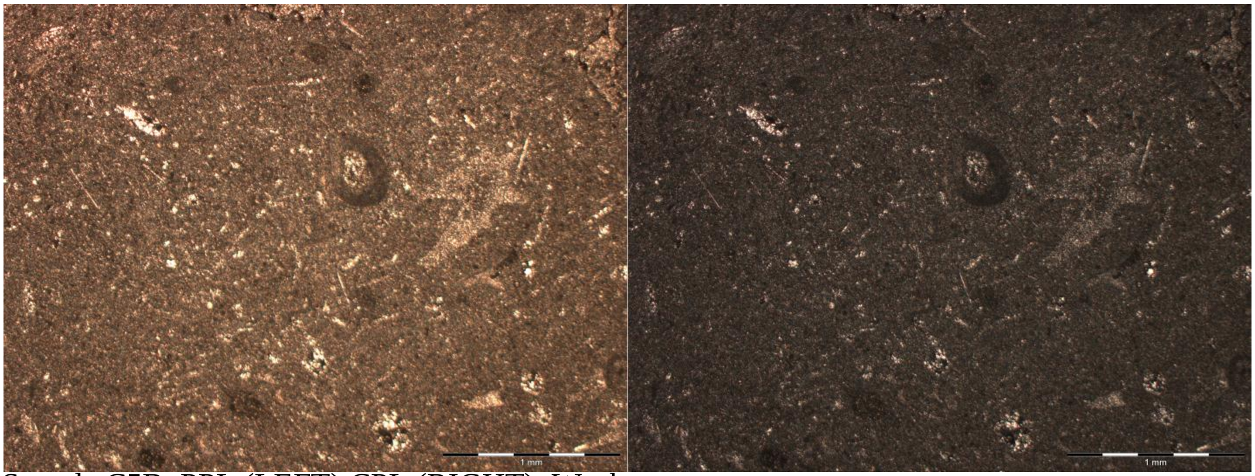
Sample C3B, PPL (LEFT) CPL (RIGHT), Wackestone.



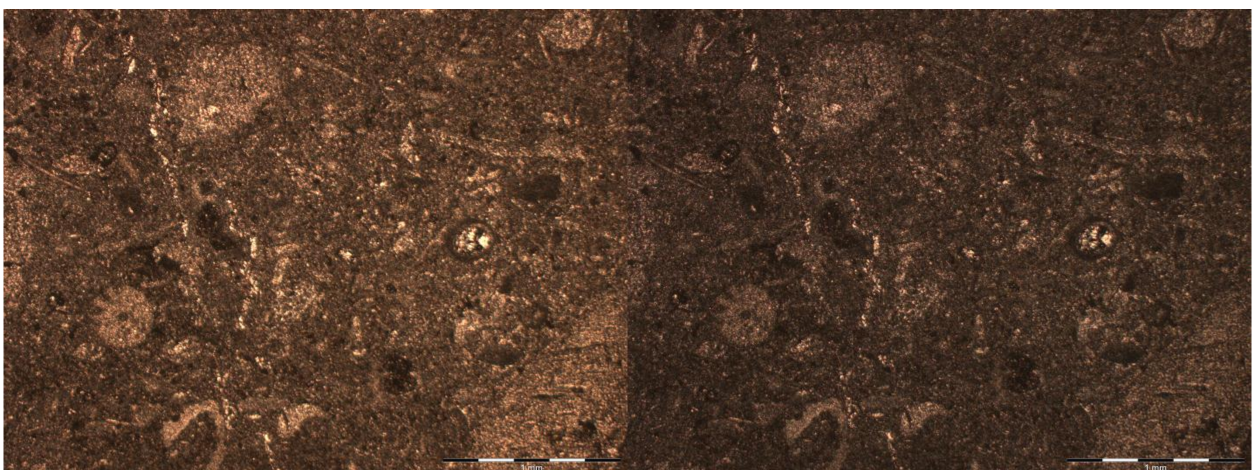
Sample C4, PPL (LEFT) CPL (RIGHT), Wackestone.



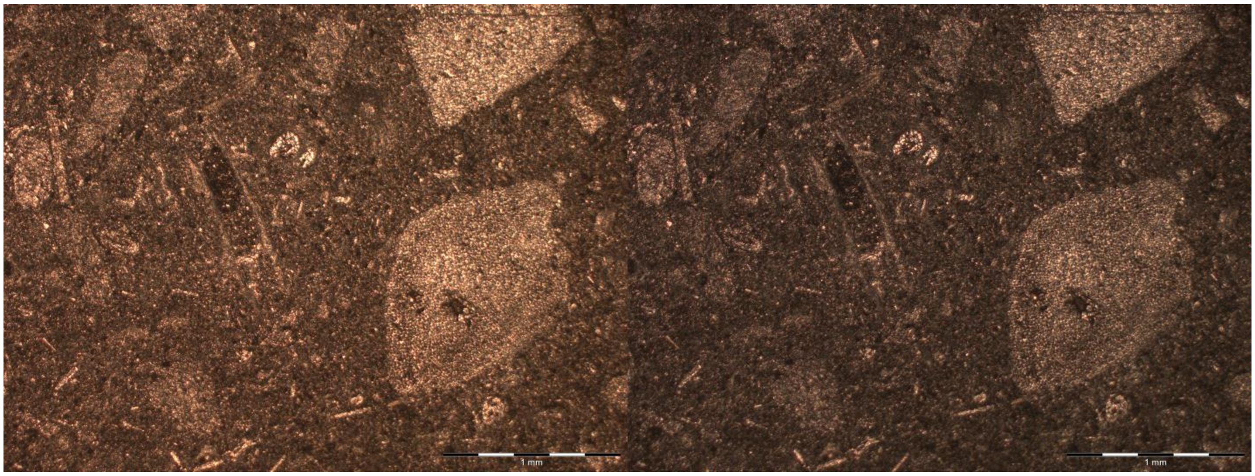
Sample C5A, PPL (LEFT) CPL (RIGHT), Wackestone.

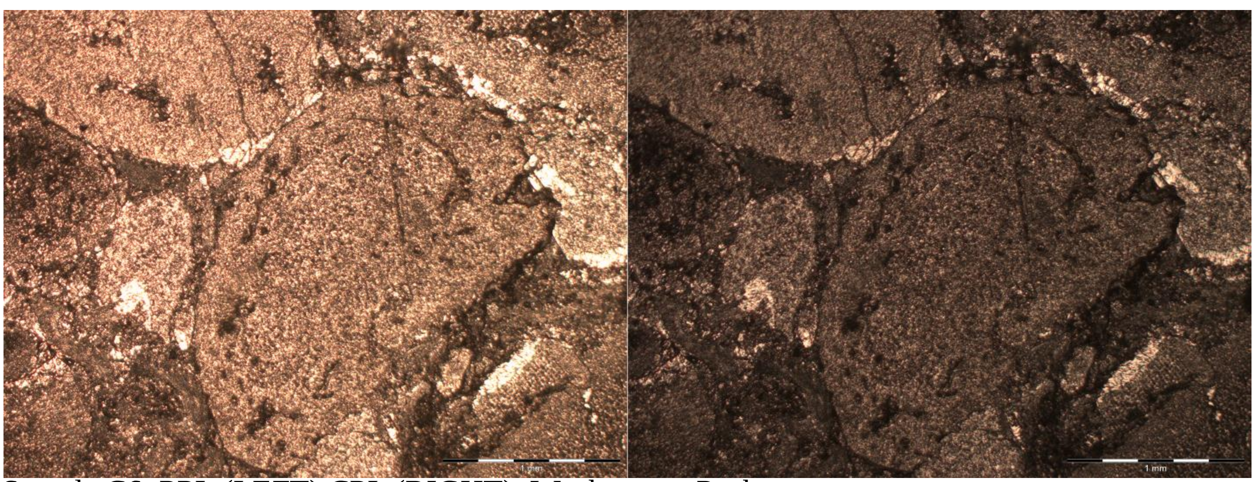


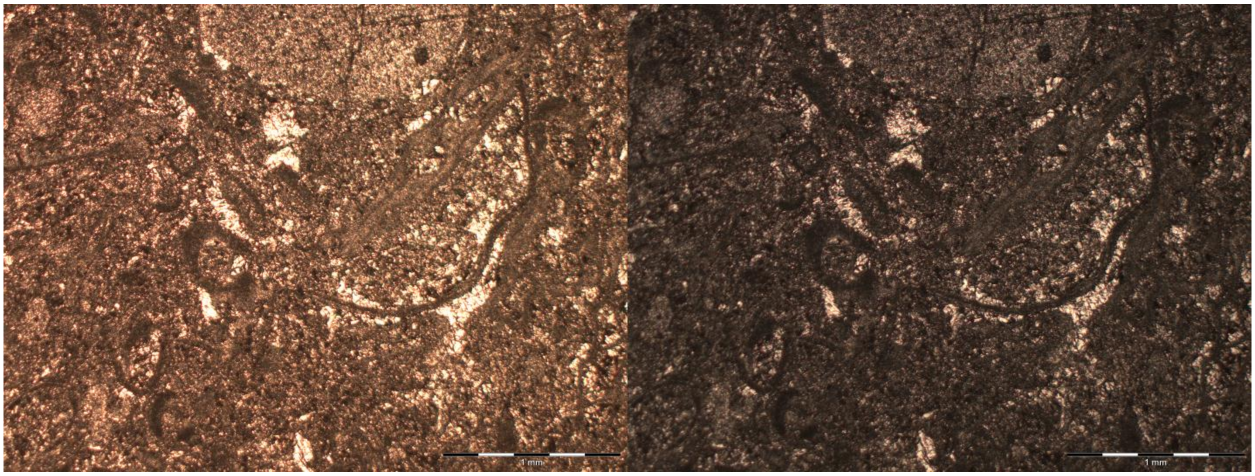
Sample C5B, PPL (LEFT) CPL (RIGHT), Wackestone.



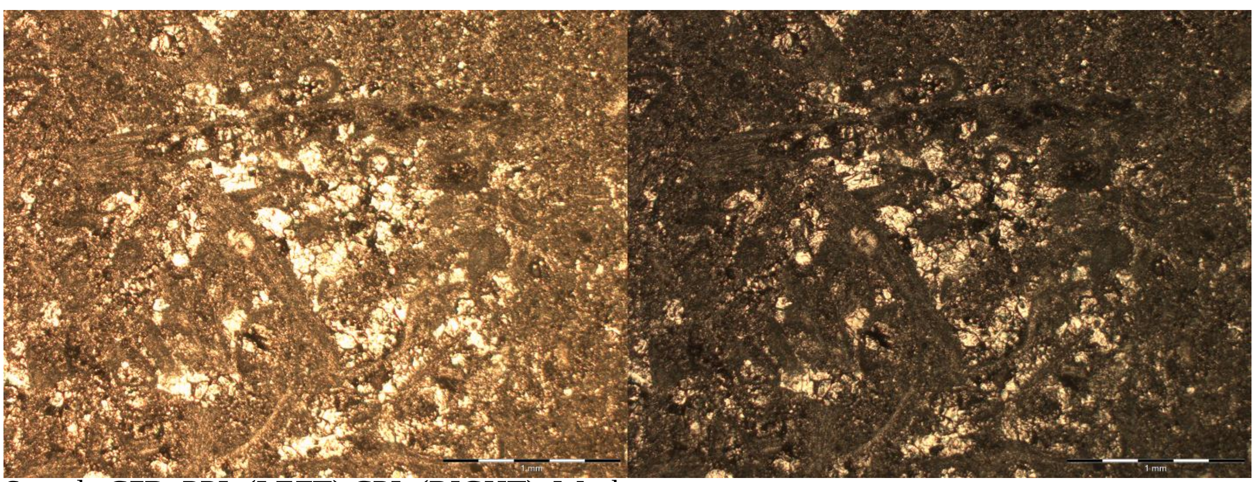
Sample C5C, PPL (LEFT) CPL (RIGHT), Wackestone.


Sample C5D, PPL (LEFT) CPL (RIGHT), Wackestone.

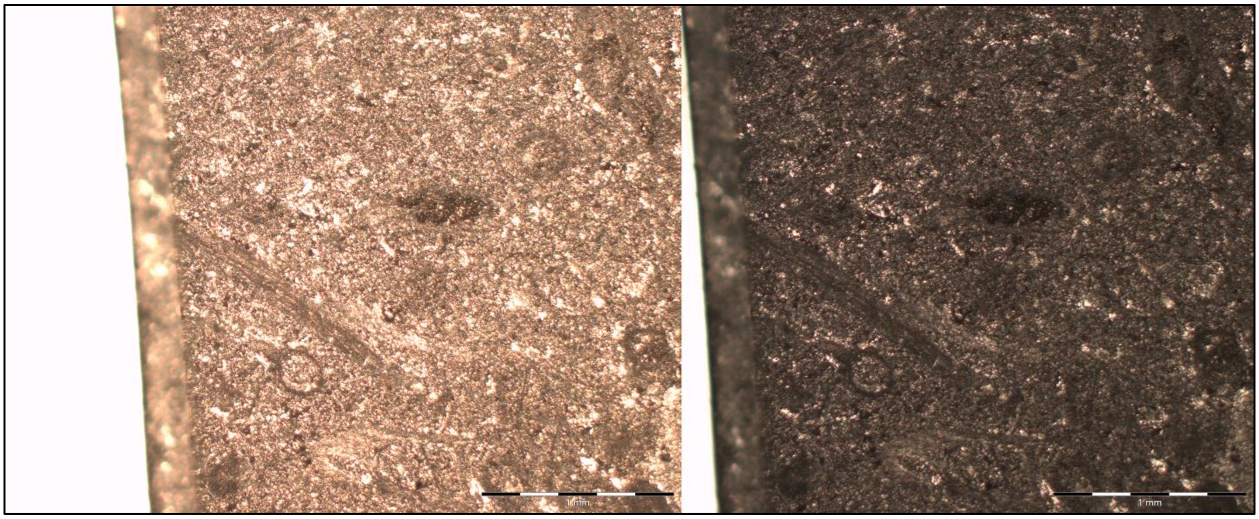

Sample C6, PPL (LEFT) CPL (RIGHT), Wackestone-Packstone.



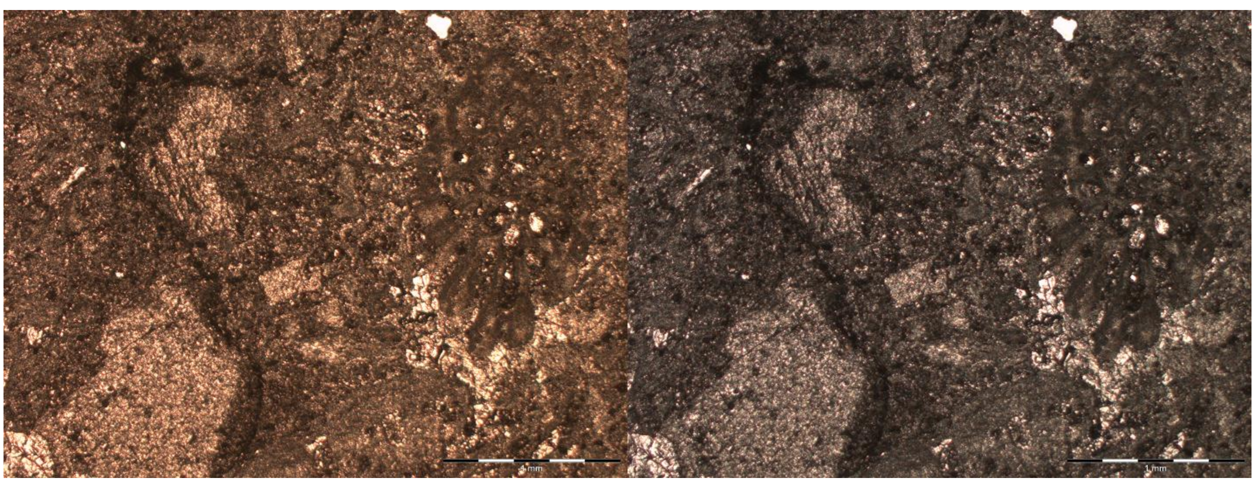
Sample C7A, PPL (LEFT) CPL (RIGHT), Packstone.



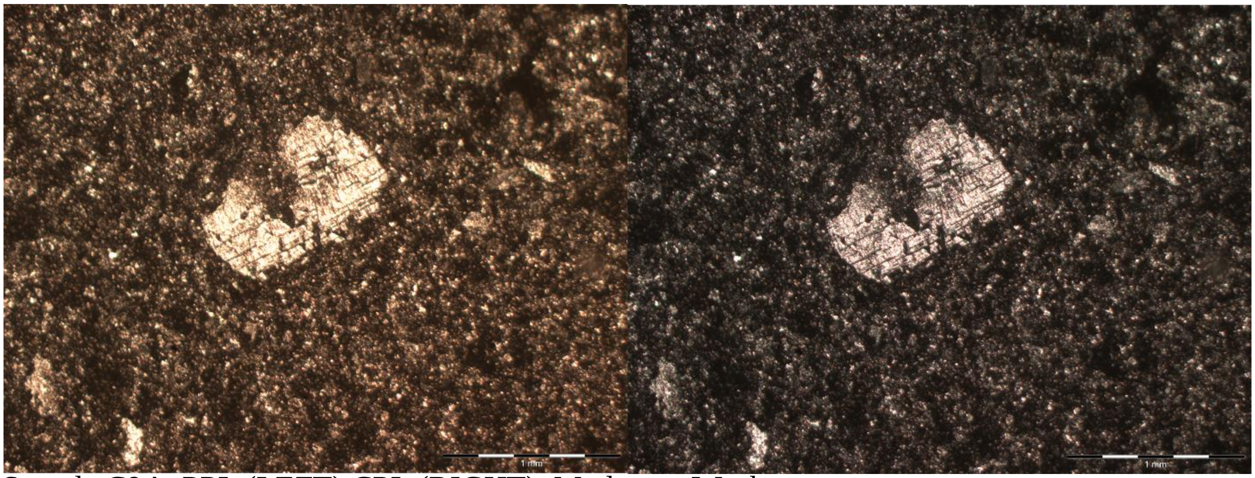
Sample C7B, PPL (LEFT) CPL (RIGHT), Wackestone.



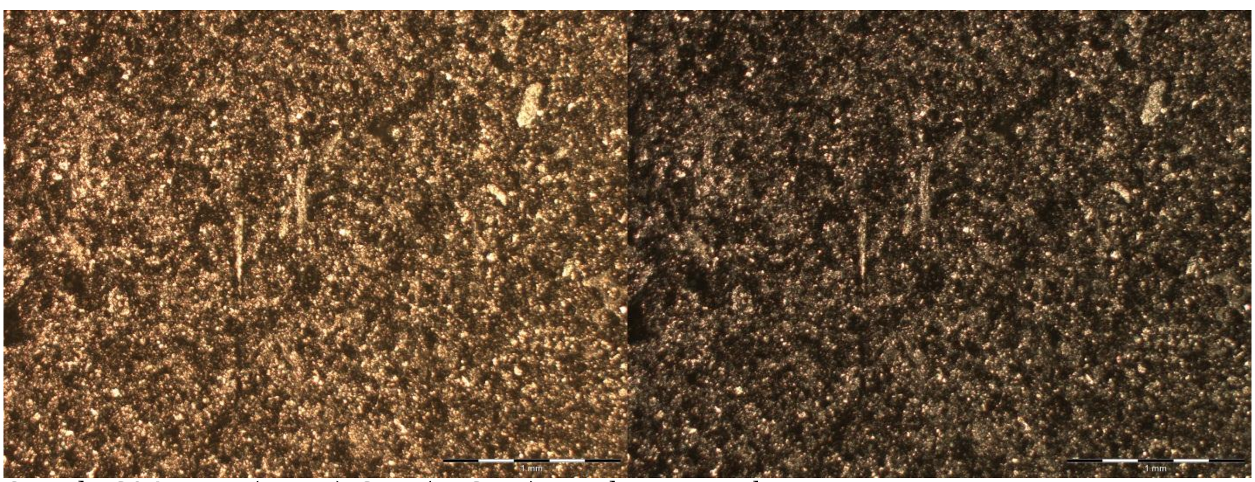
Sample C7C, PPL (LEFT) CPL (RIGHT), Wackestone.



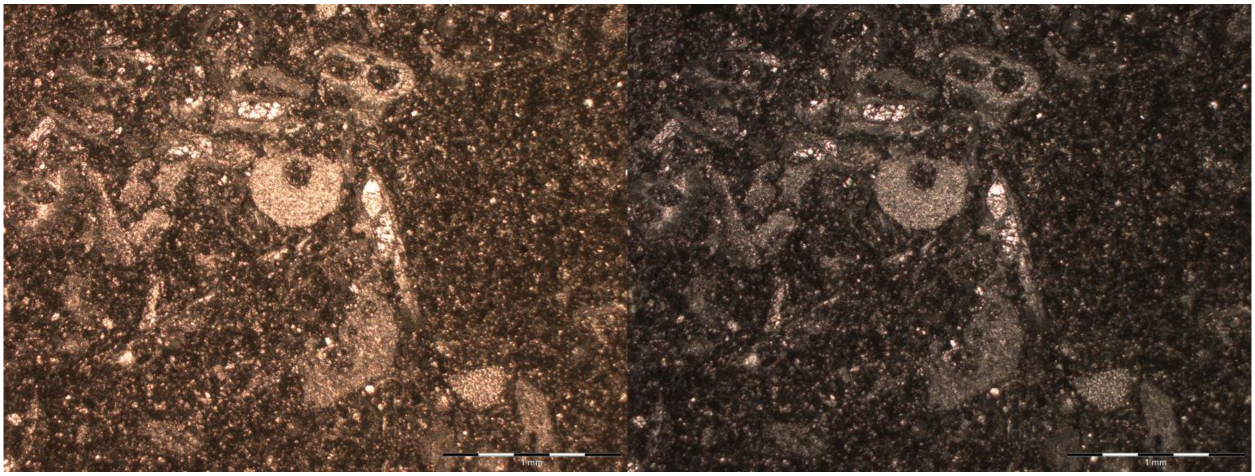
Sample C8, PPL (LEFT) CPL (RIGHT), Wackestone.



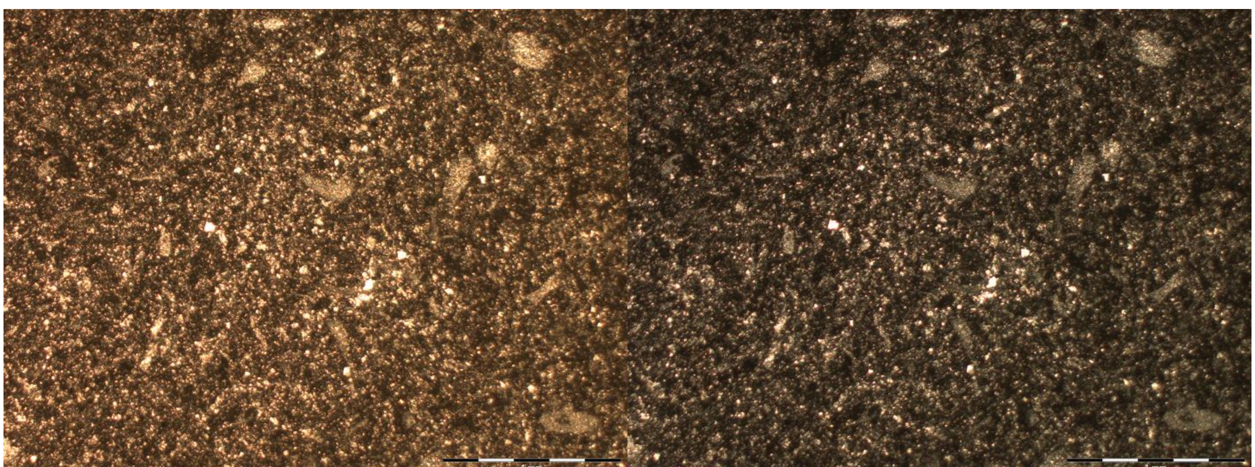
Sample C9A, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone.



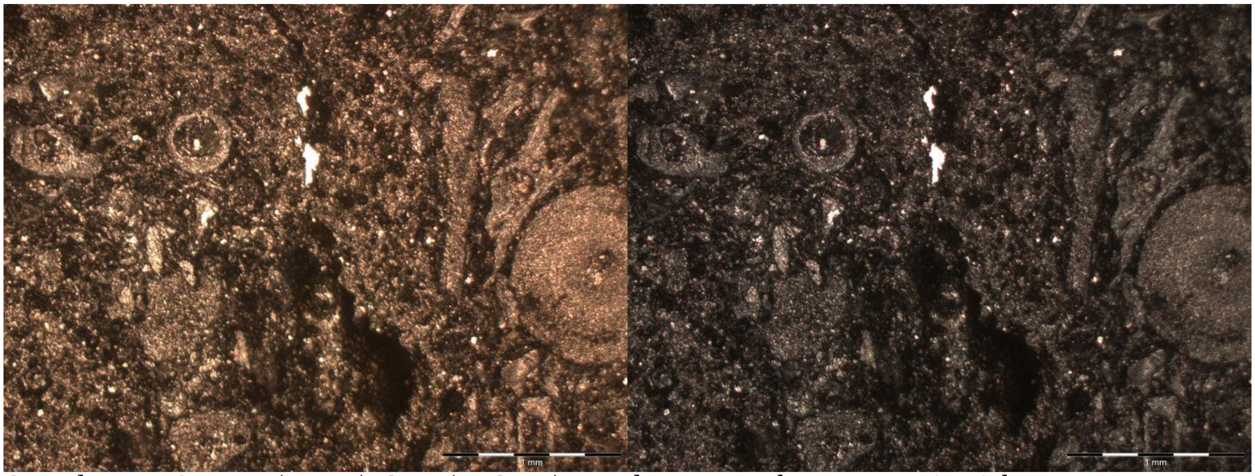
Sample C9A, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone



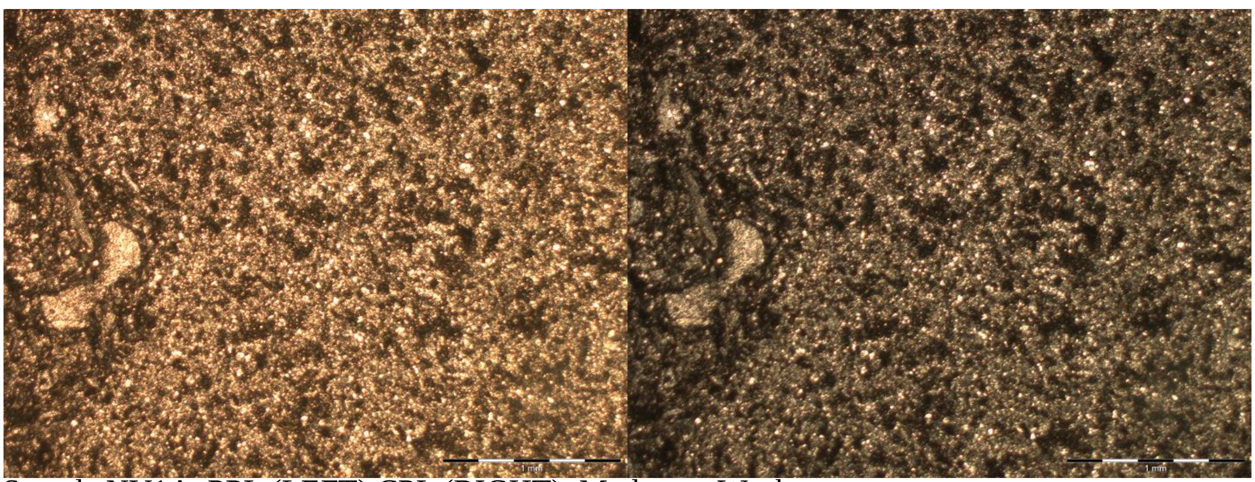
Sample C9B, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone, grain-rich area.



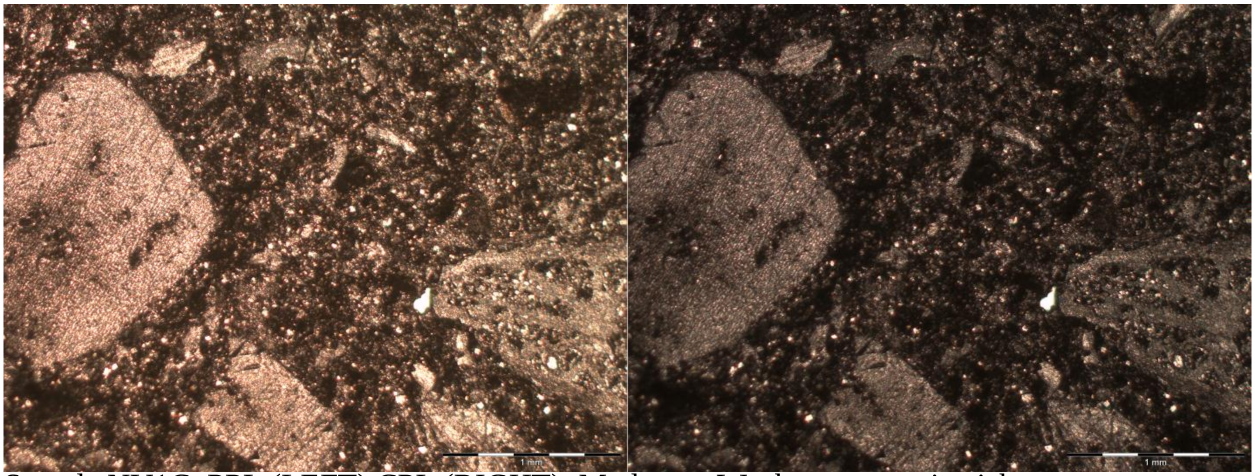
Sample C9B, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone.



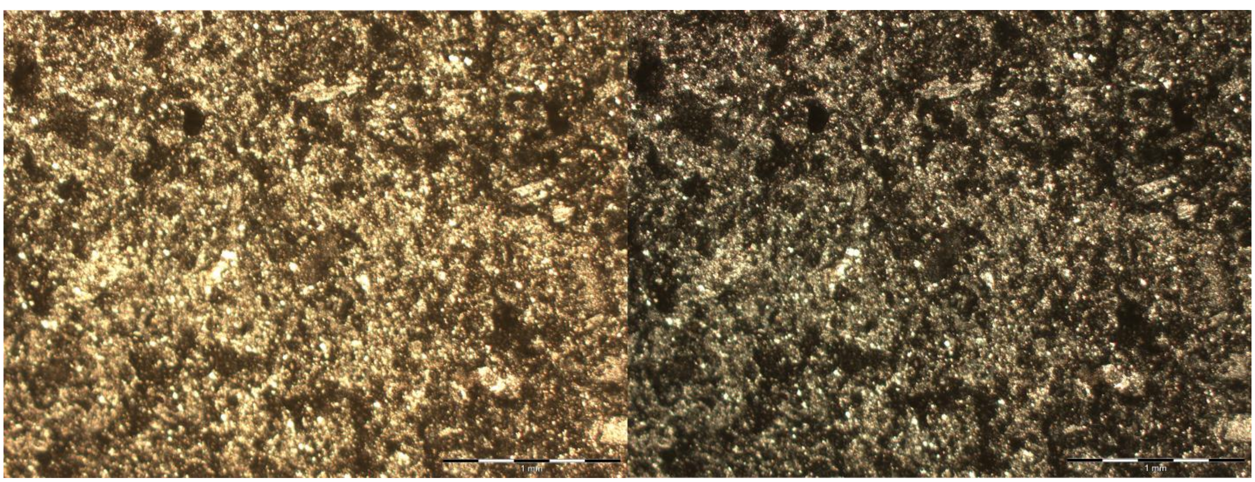
Sample NV1A, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone, grain-rich area.



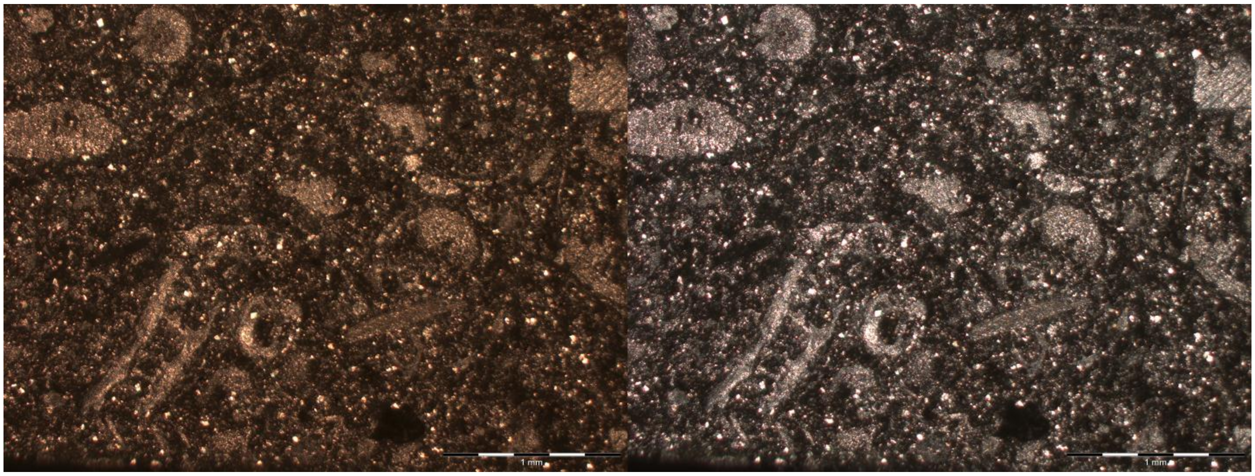
Sample NV1A, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone.



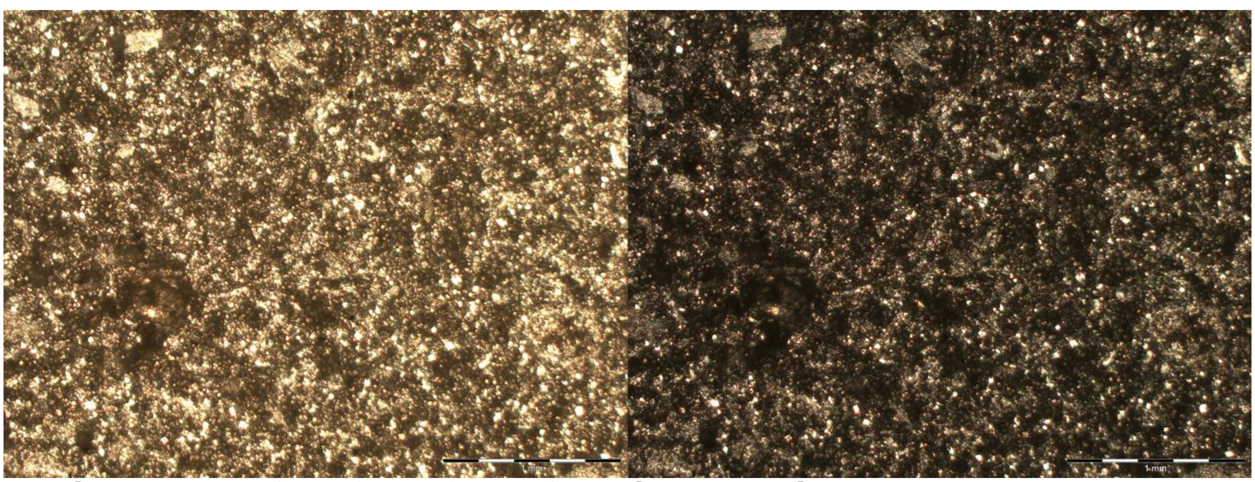
Sample NV1C, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone, grain-rich area.



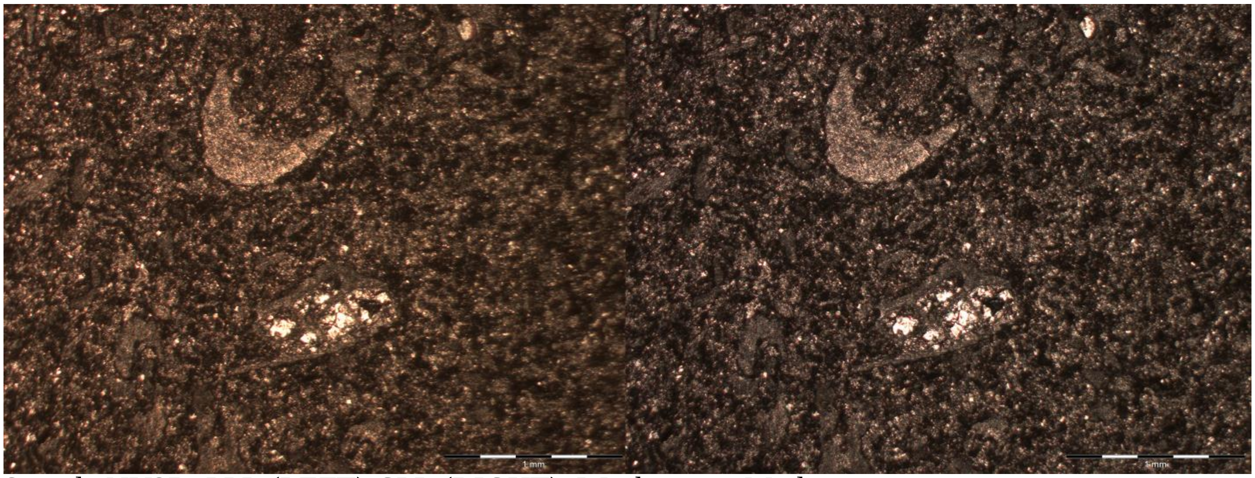
Sample NV1C, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone.



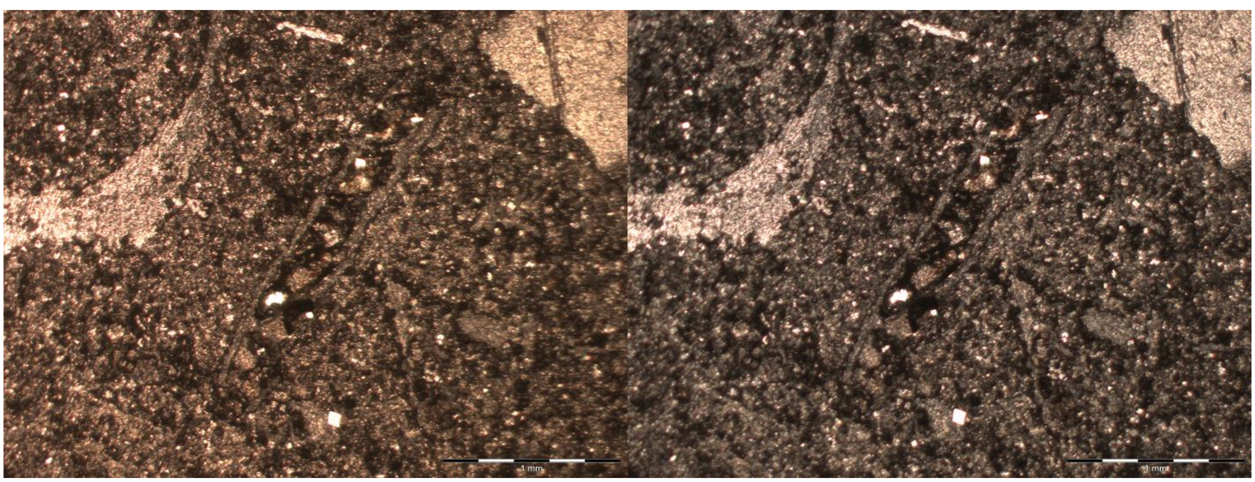
Sample NV1D, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone, grain-rich area.



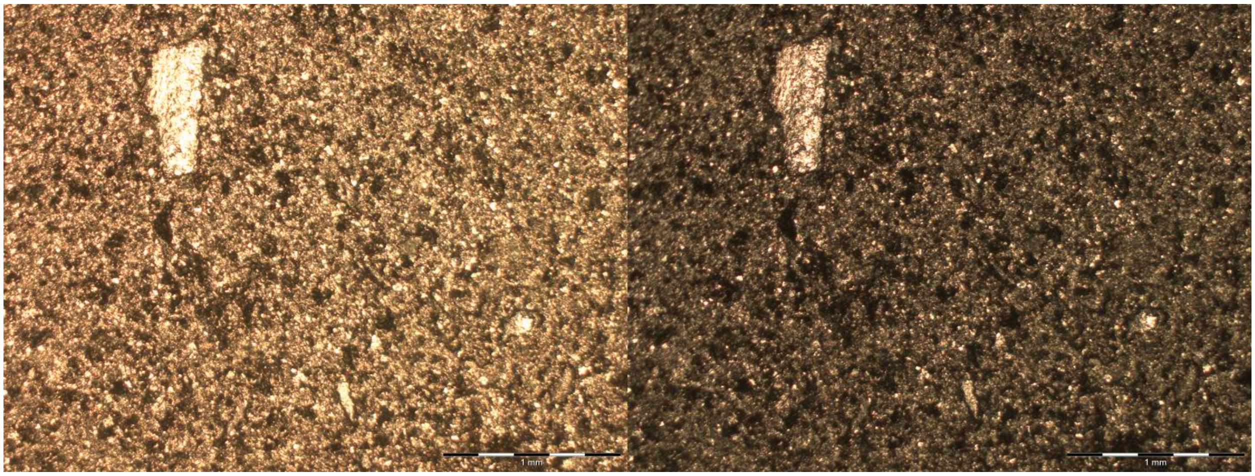
Sample NV1D, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.



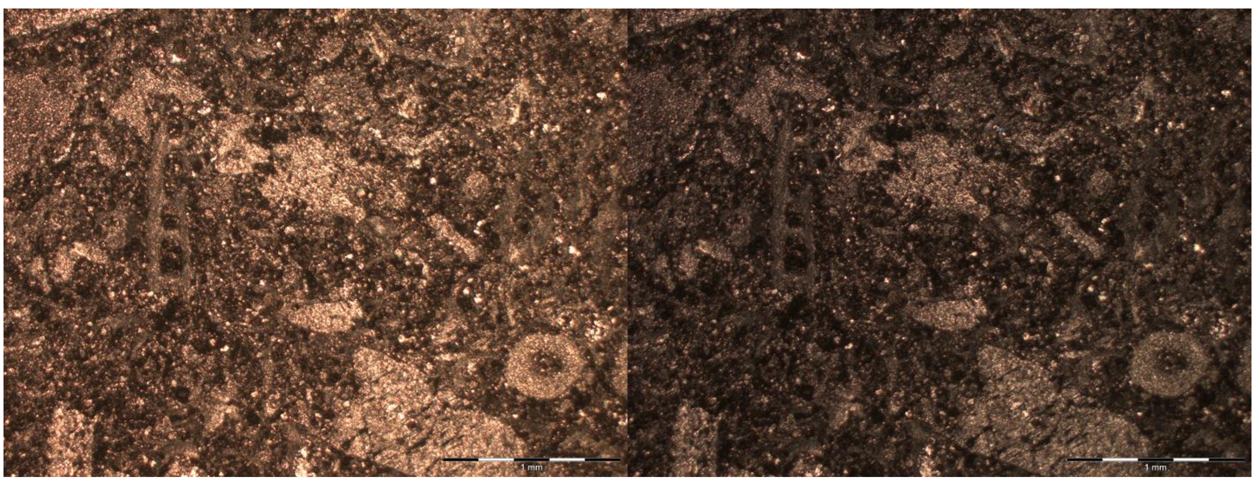
Sample NV2B, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.



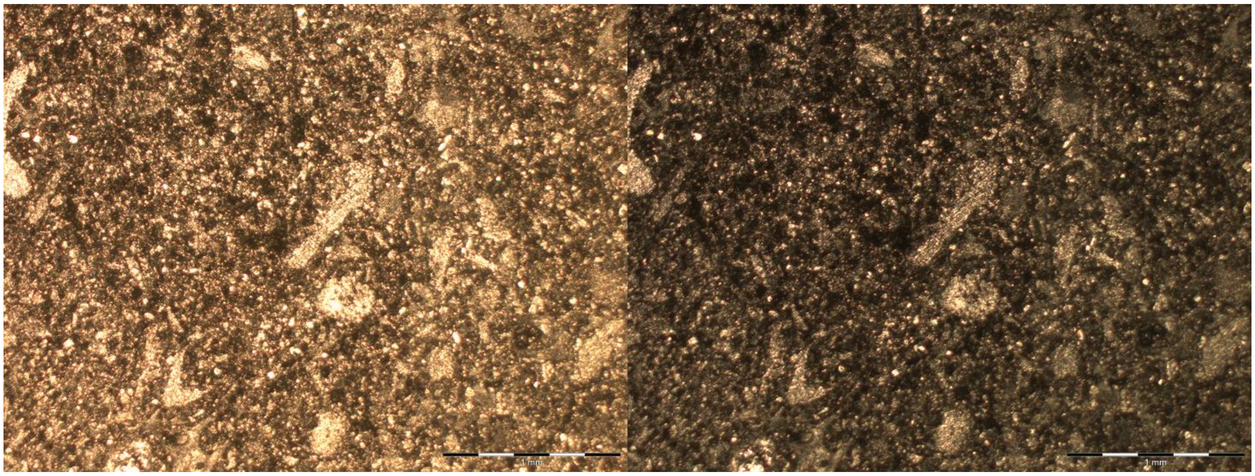
Sample P1A, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone, grain-rich area.

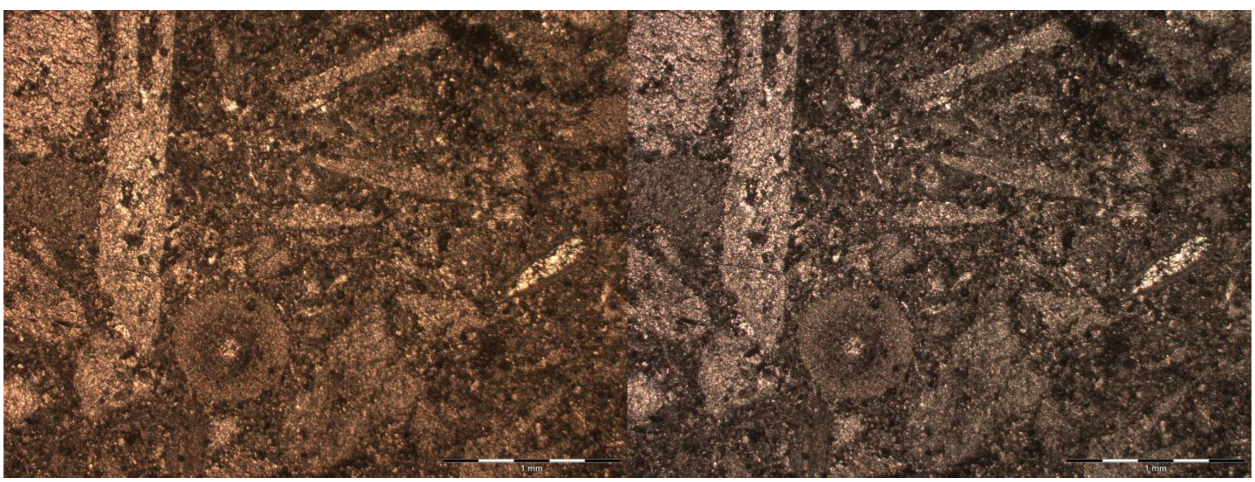


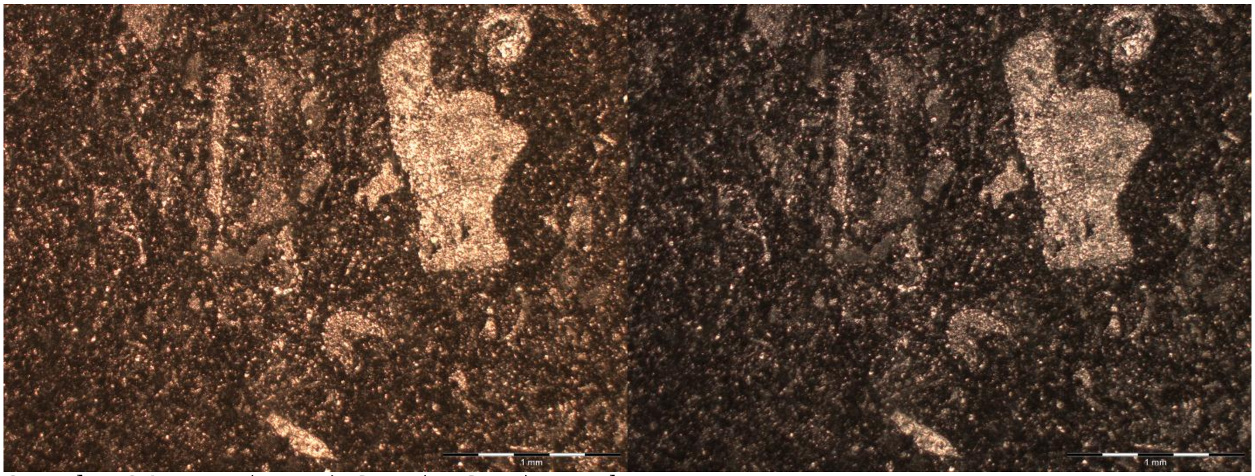
Sample P1A, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone.

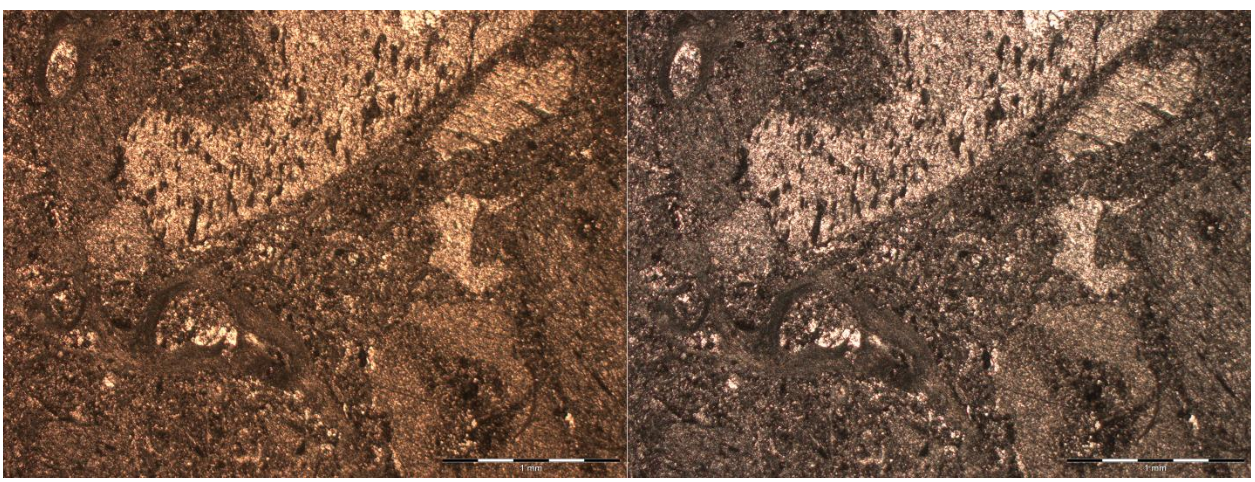


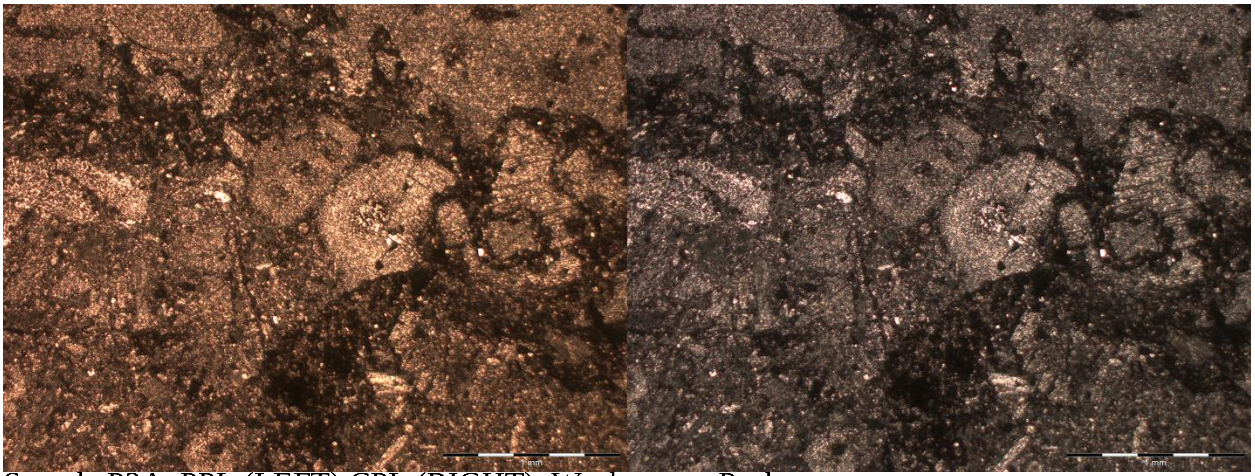
Sample P1B, PPL (LEFT) CPL (RIGHT), Wackestone, grain-rich area.


Sample P1B, PPL (LEFT) CPL (RIGHT), Wackestone.

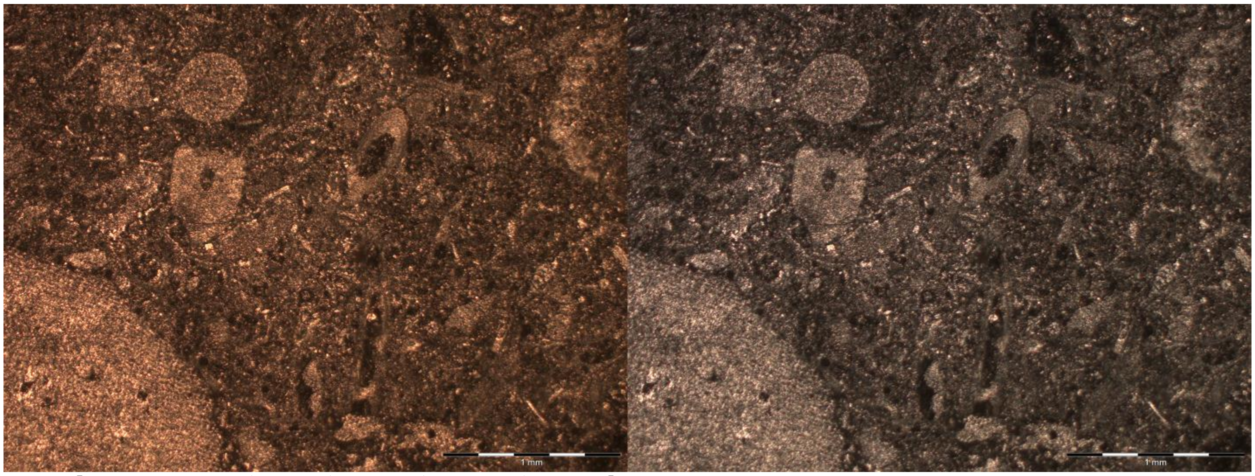

Sample P1C, PPL (LEFT) CPL (RIGHT), Wackestone.


Sample P2A, PPL (LEFT) CPL (RIGHT), Wackestone.

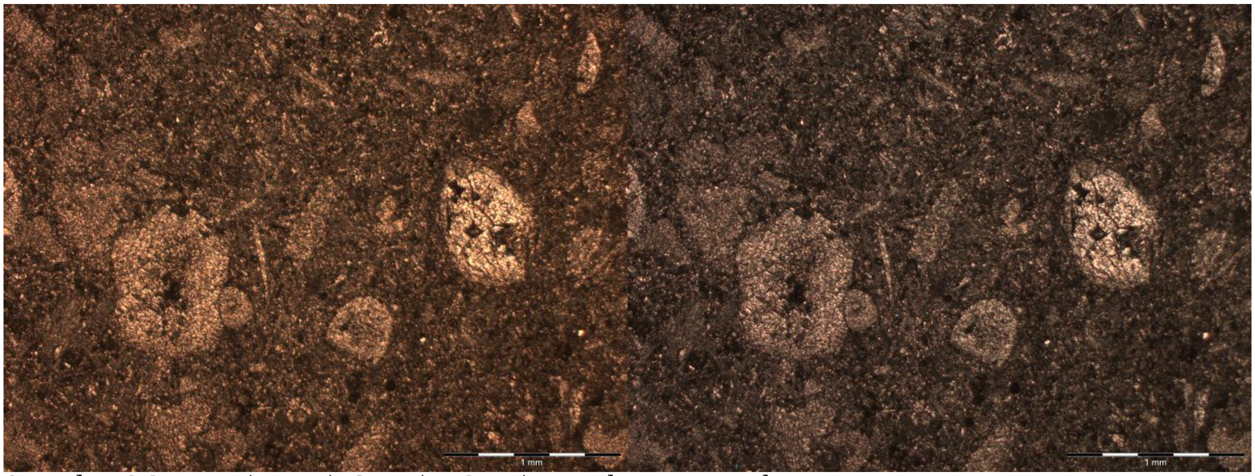

Sample P2B, PPL (LEFT) CPL (RIGHT), Wackestone.

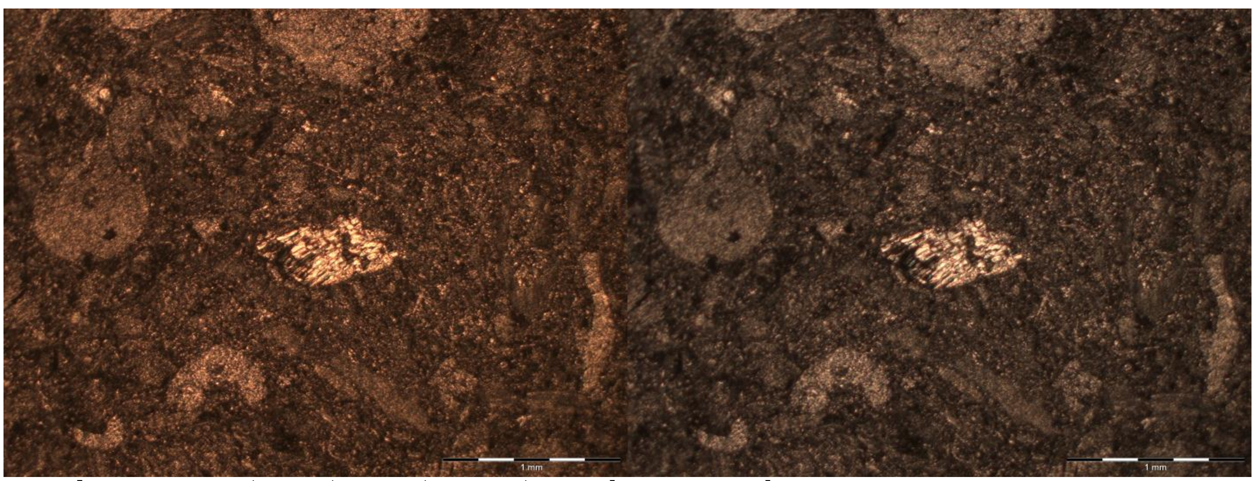


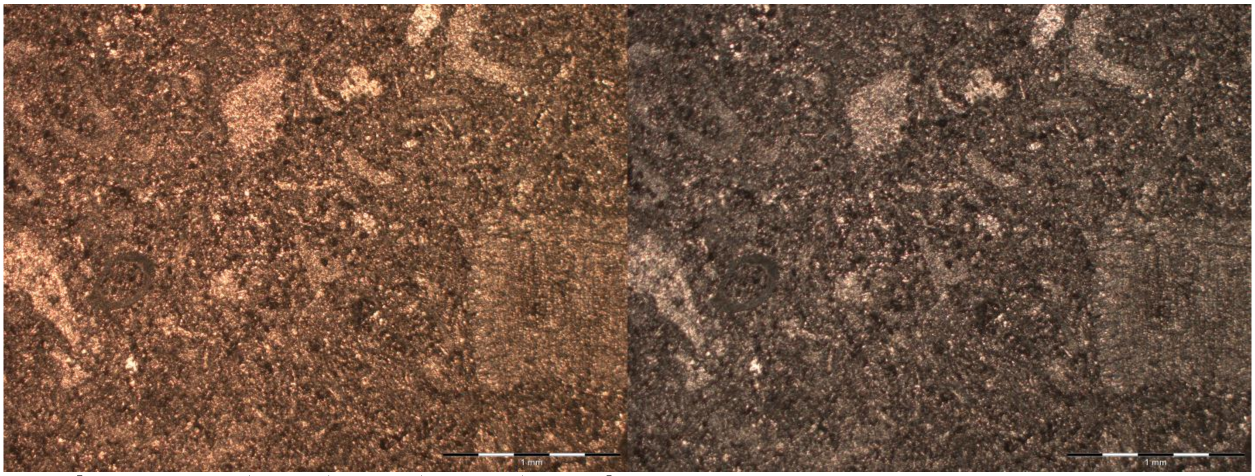
Sample P3A, PPL (LEFT) CPL (RIGHT), Wackestone-Packstone.



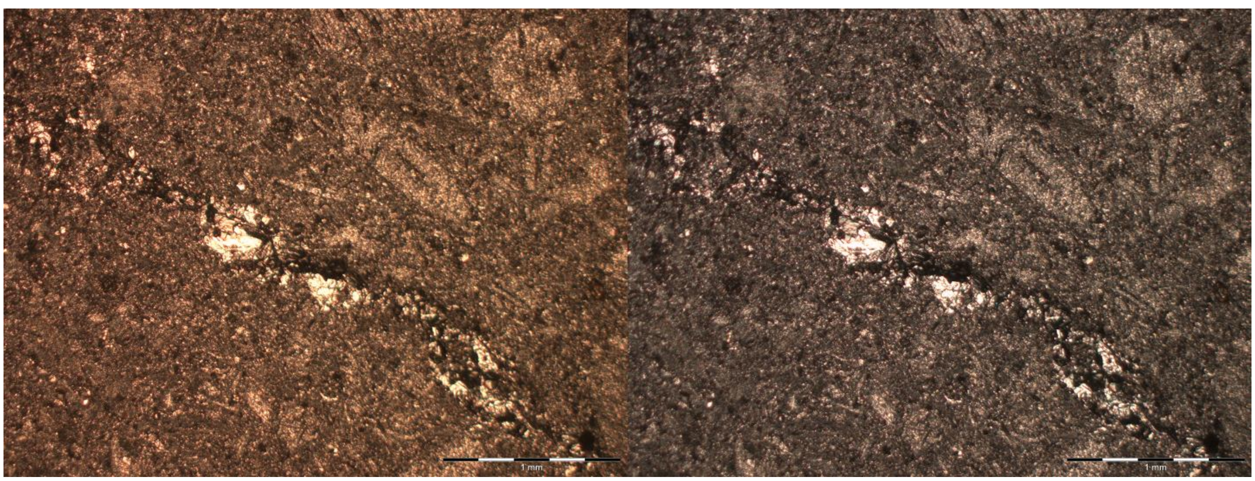
Sample P3B, PPL (LEFT) CPL (RIGHT), Wackestone.


Sample P3C, PPL (LEFT) CPL (RIGHT), Wackestone-Packstone.

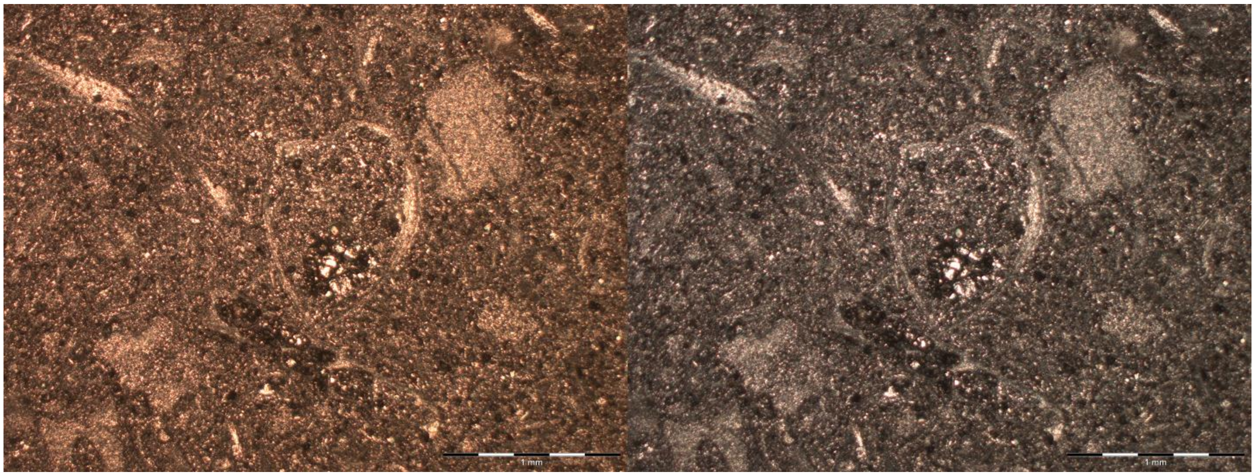

Sample P3D, PPL (LEFT) CPL (RIGHT), Wackestone-Packstone.



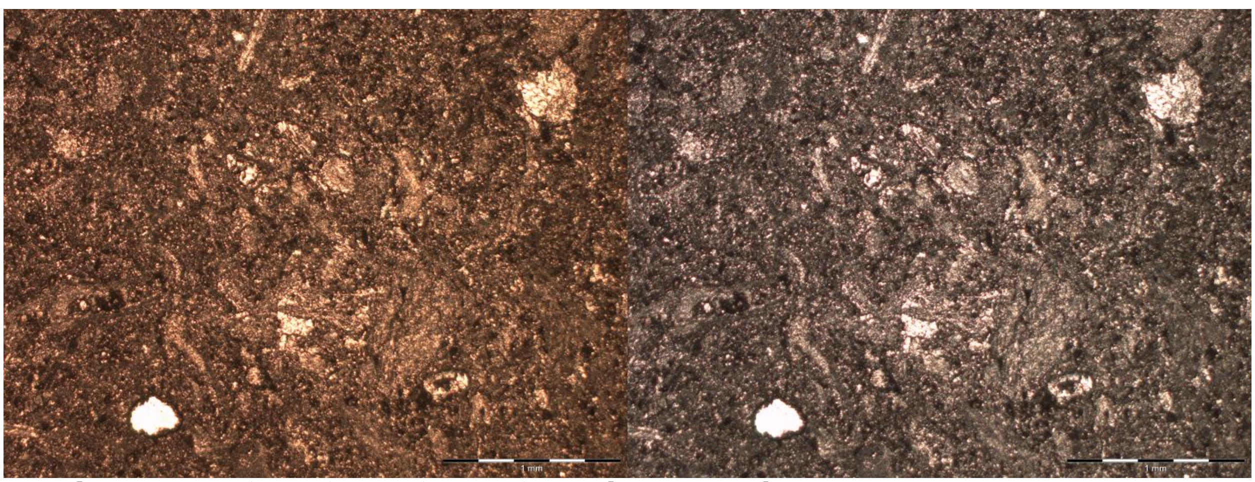
Sample P3E, PPL (LEFT) CPL (RIGHT), Wackestone.



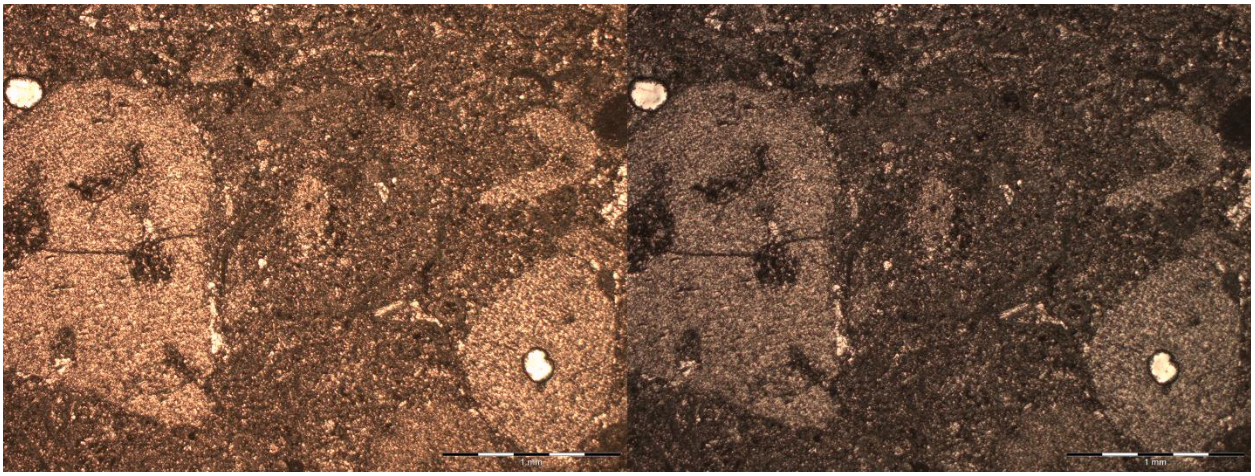
Sample P3E, PPL (LEFT) CPL (RIGHT), Wackestone.



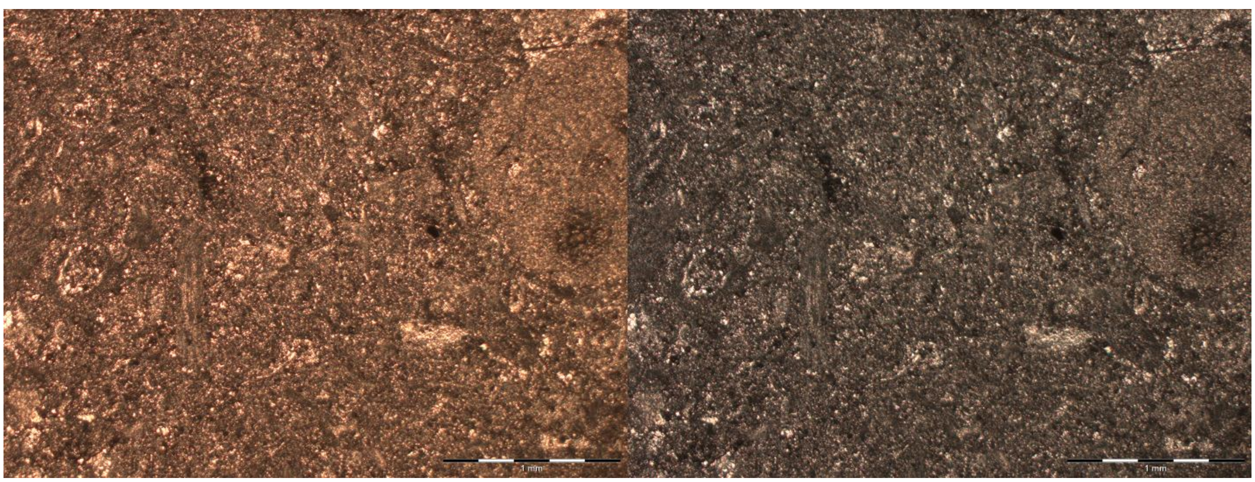
Sample P4A, PPL (LEFT) CPL (RIGHT), Wackestone.



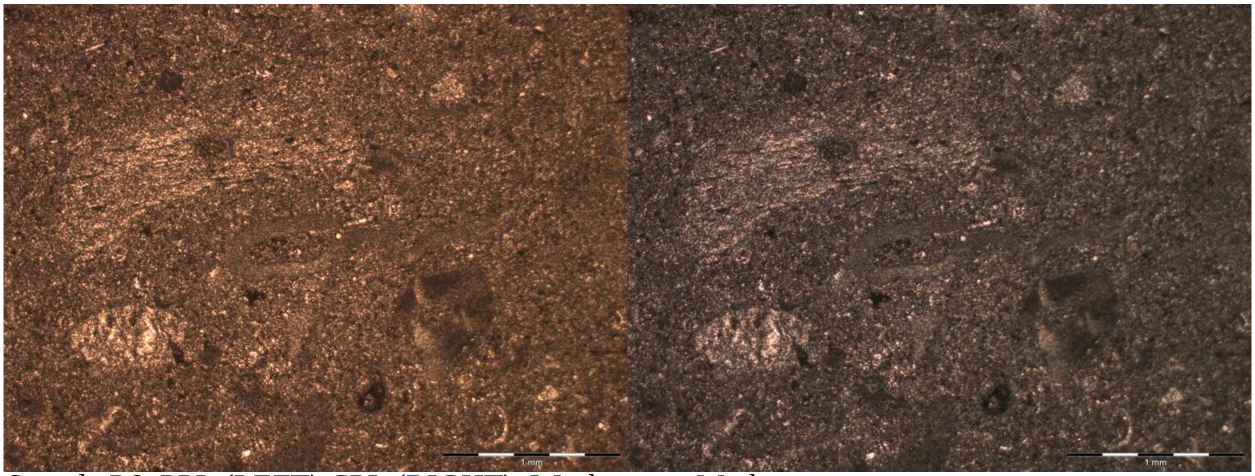
Sample P4B, PPL (LEFT) CPL (RIGHT), Wackestone-Packstone.

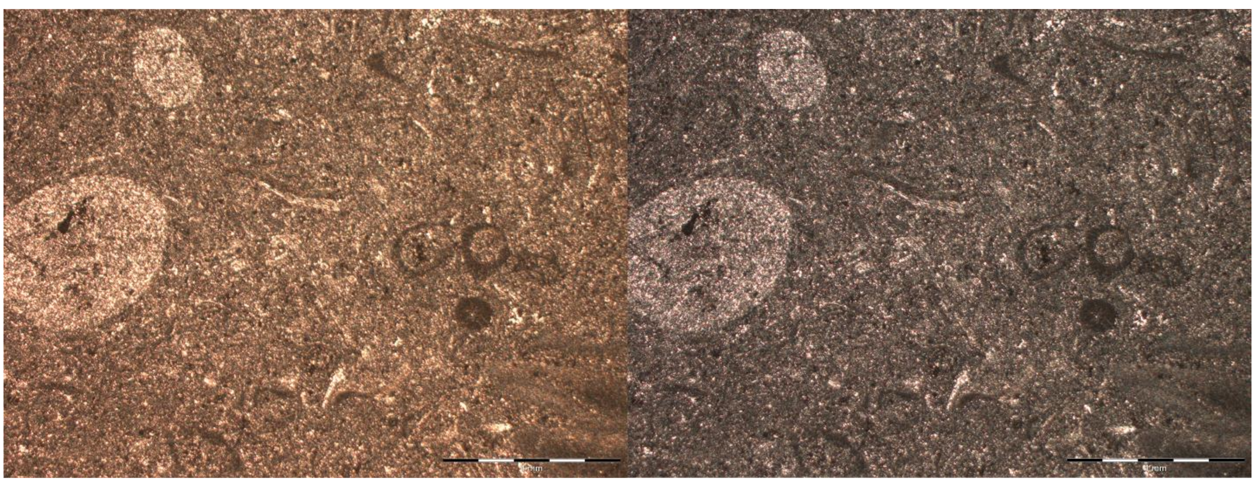


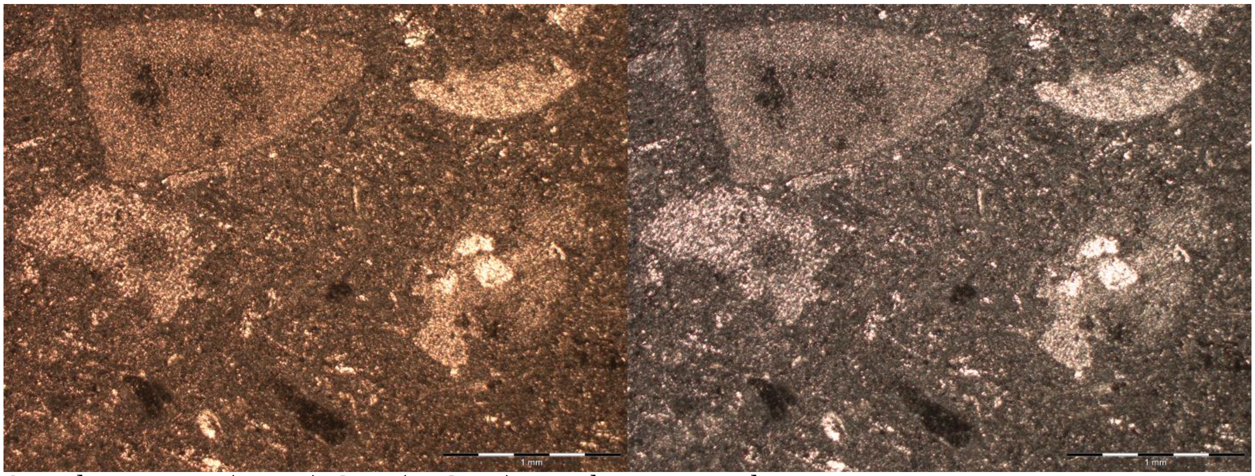
Sample P4C, PPL (LEFT) CPL (RIGHT), Wackestone.



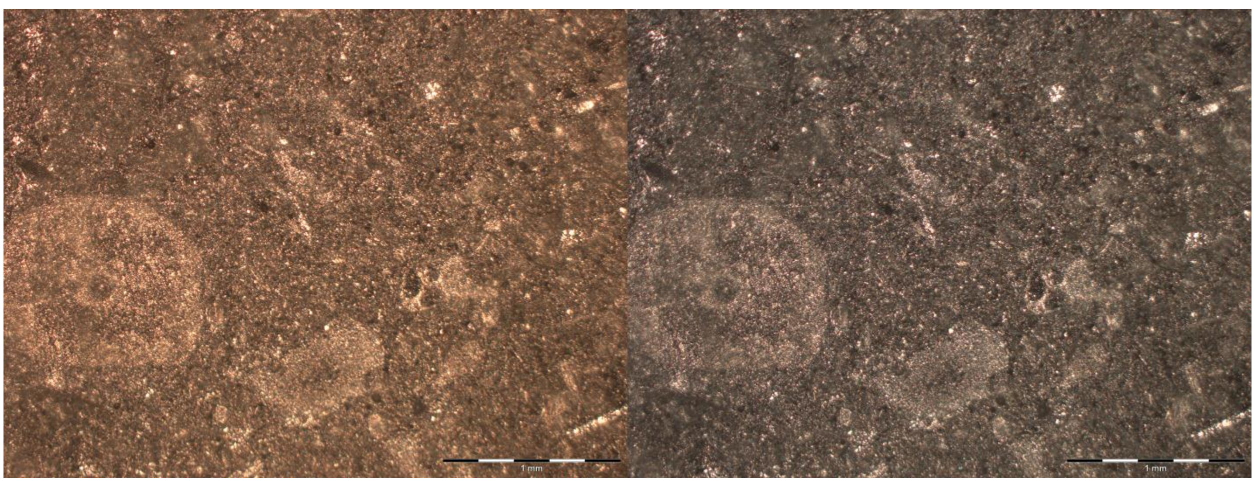
Sample P5, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.


Sample P6, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.

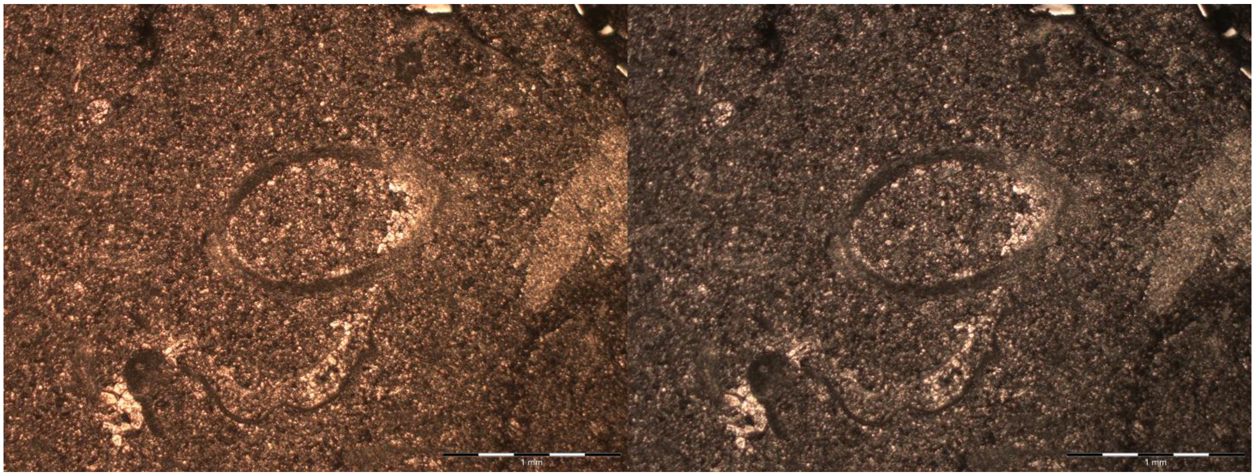

Sample P7A, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.



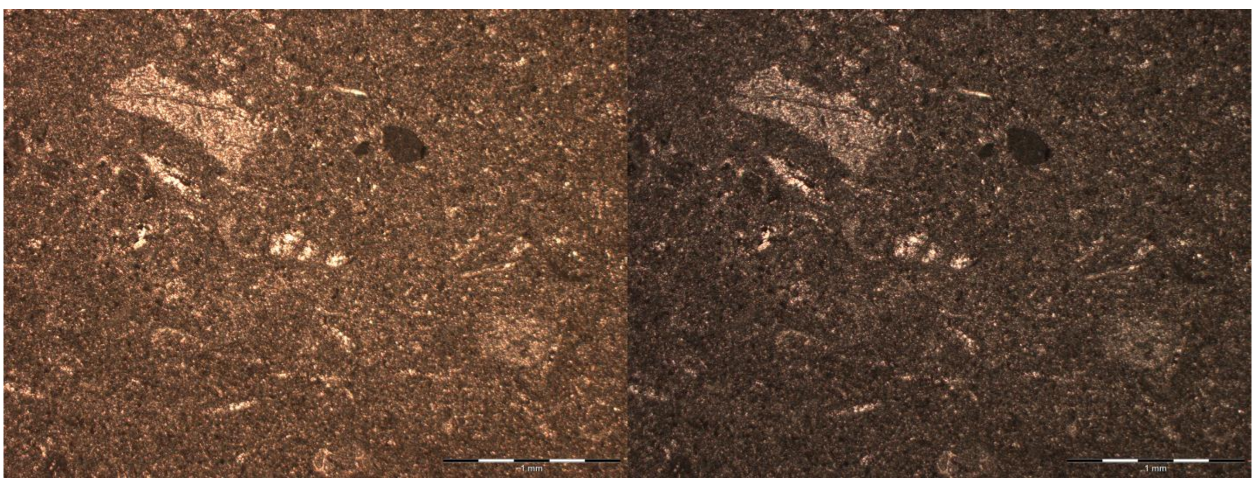
Sample 7B, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.



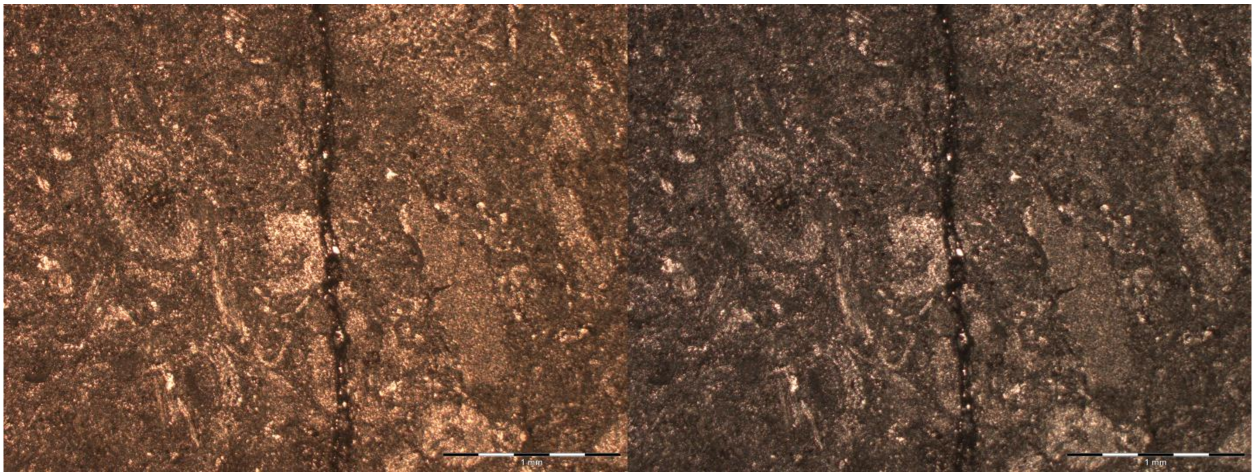
Sample P7C, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.



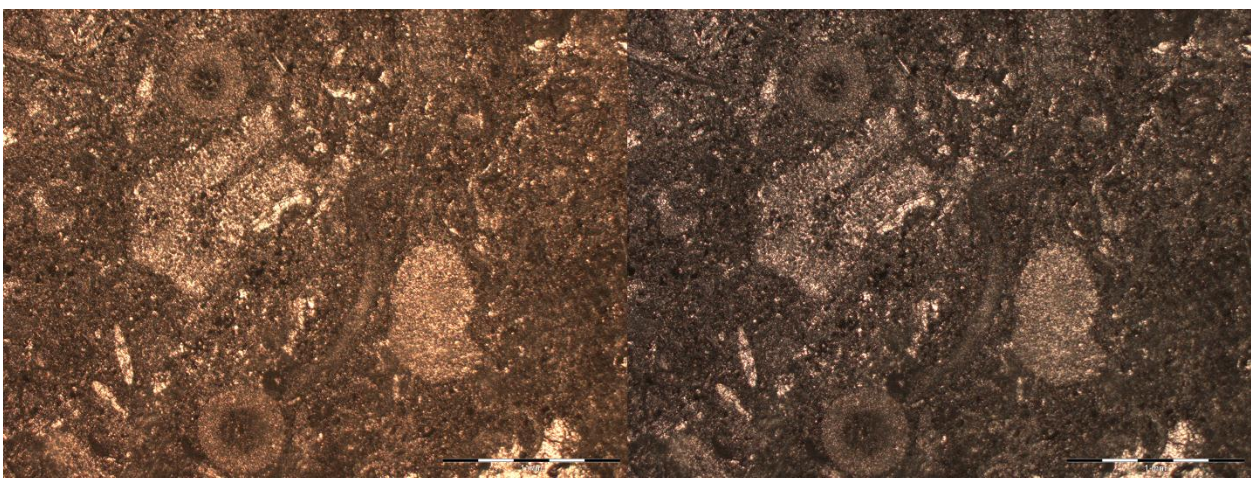
Sample P8A, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.



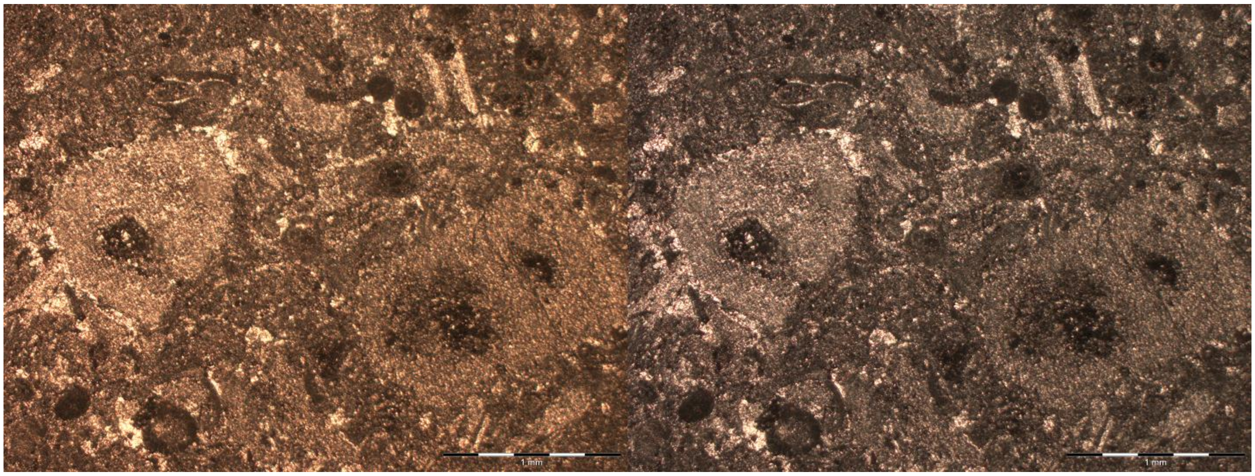
Sample P8B, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.



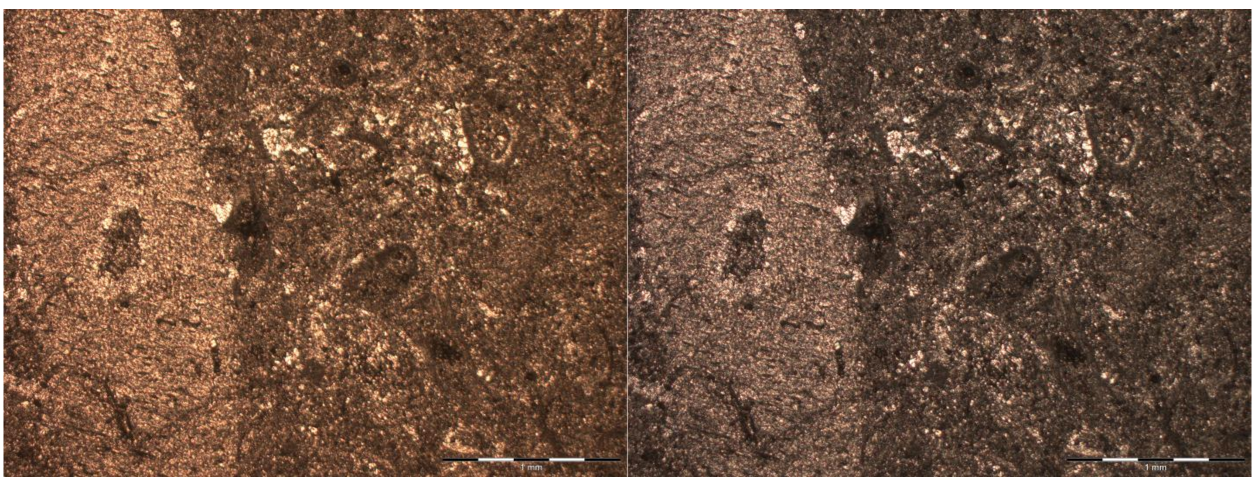
Sample P8C, PPL (LEFT) CPL (RIGHT), Wackestone-Packstone.



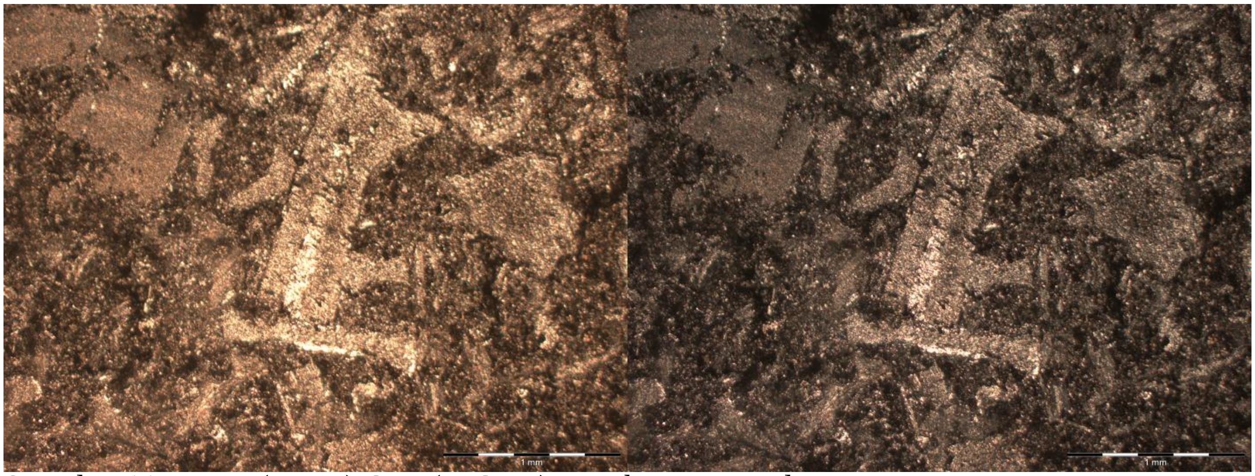
Sample P9, PPL (LEFT) CPL (RIGHT), Wackestone.



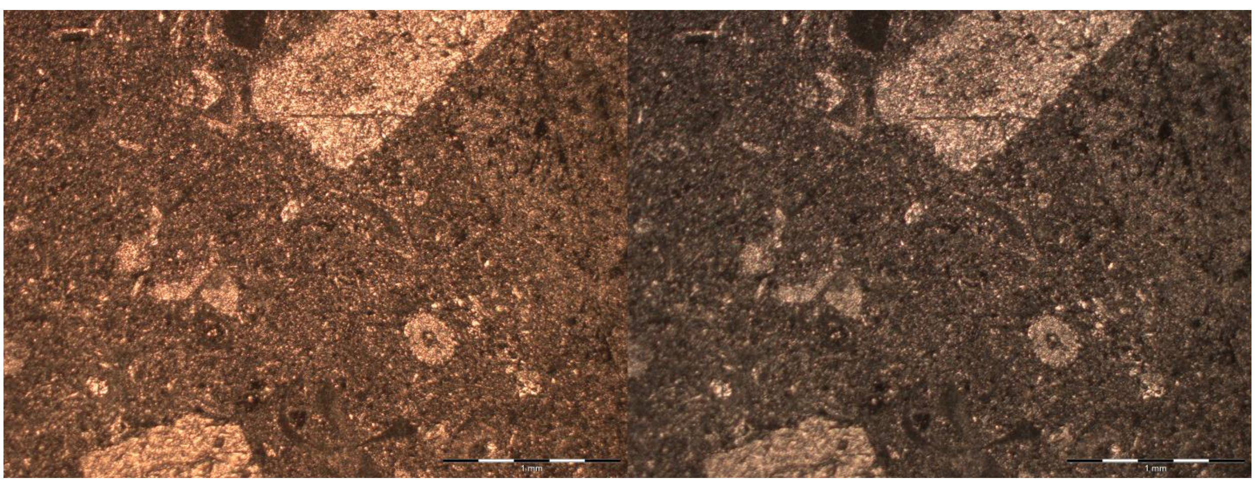
Sample P10, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.



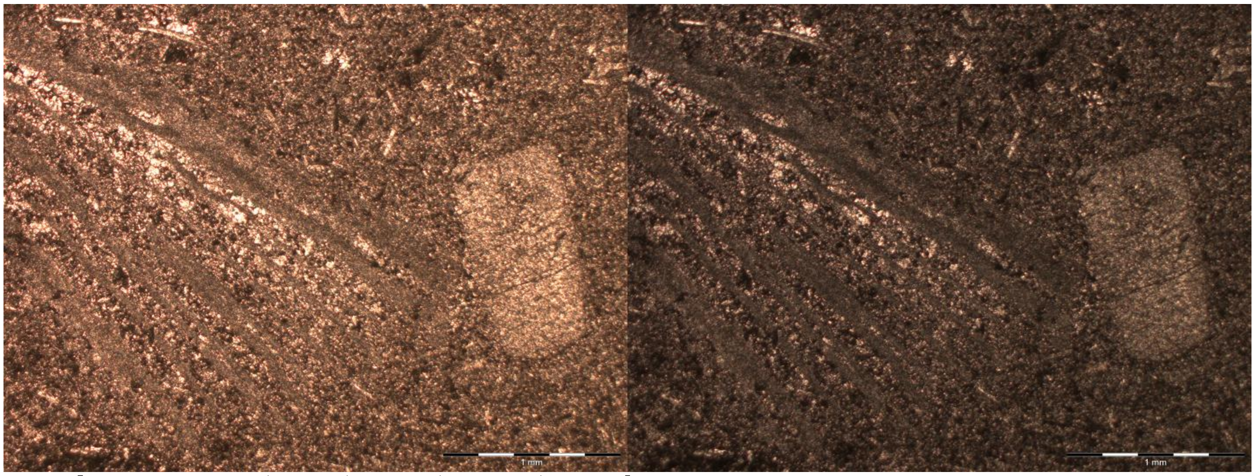
Sample P11A, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.



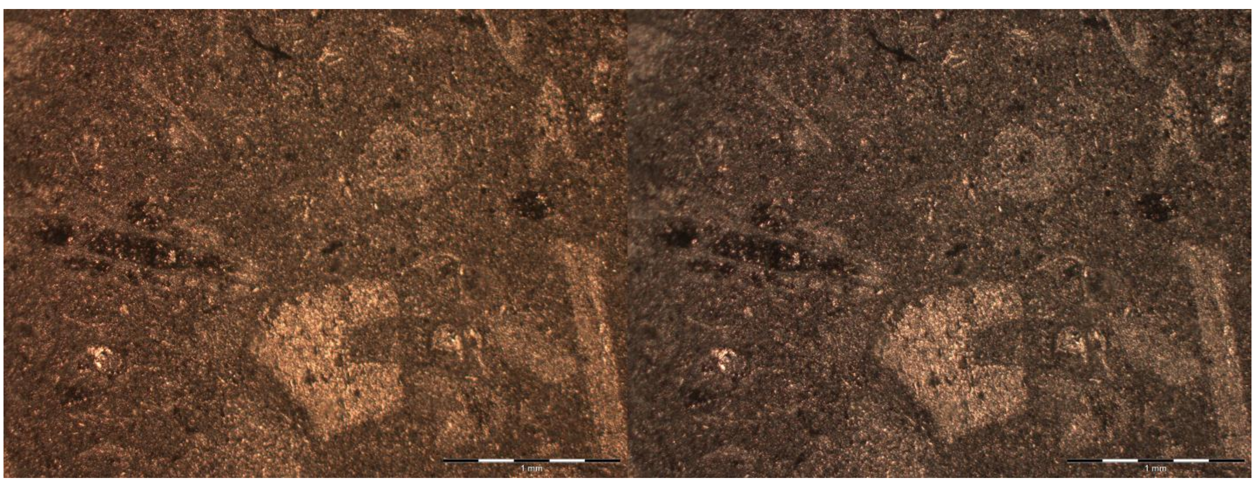
Sample P11B, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.



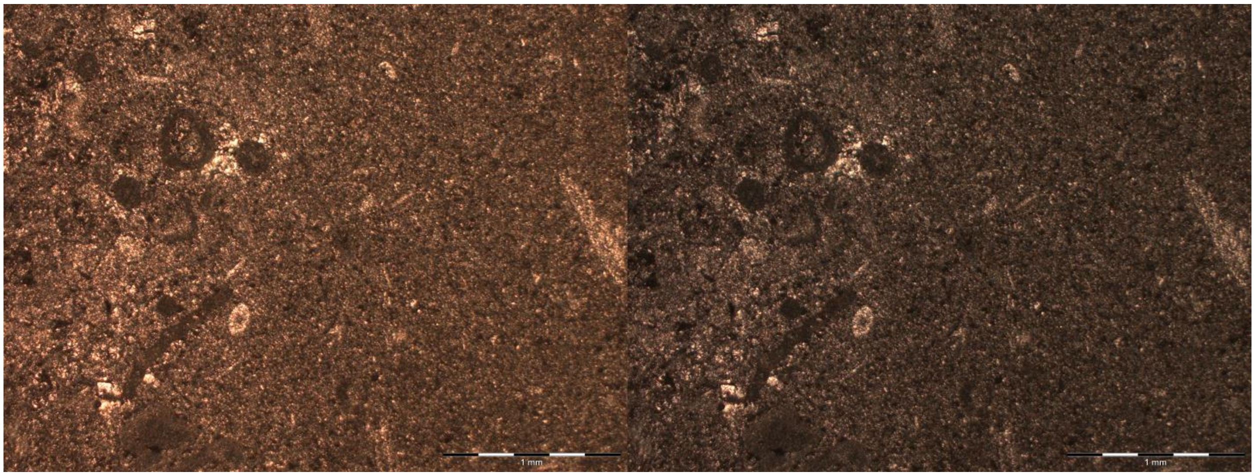
Sample P12A, PPL (LEFT) CPL (RIGHT), Wackestone.



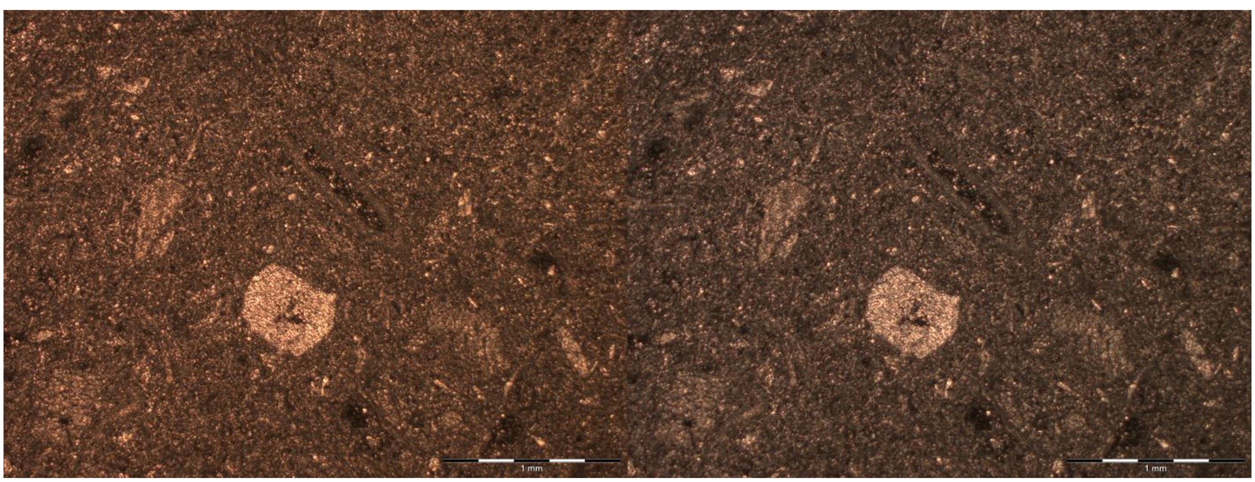
Sample P12B, PPL (LEFT) CPL (RIGHT), Wackestone.



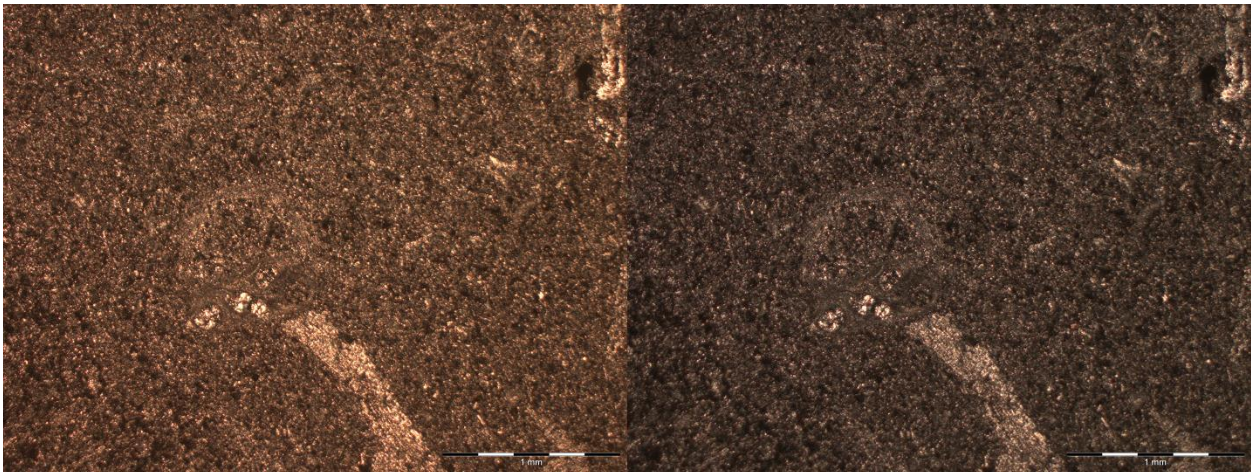
Sample P13A, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.

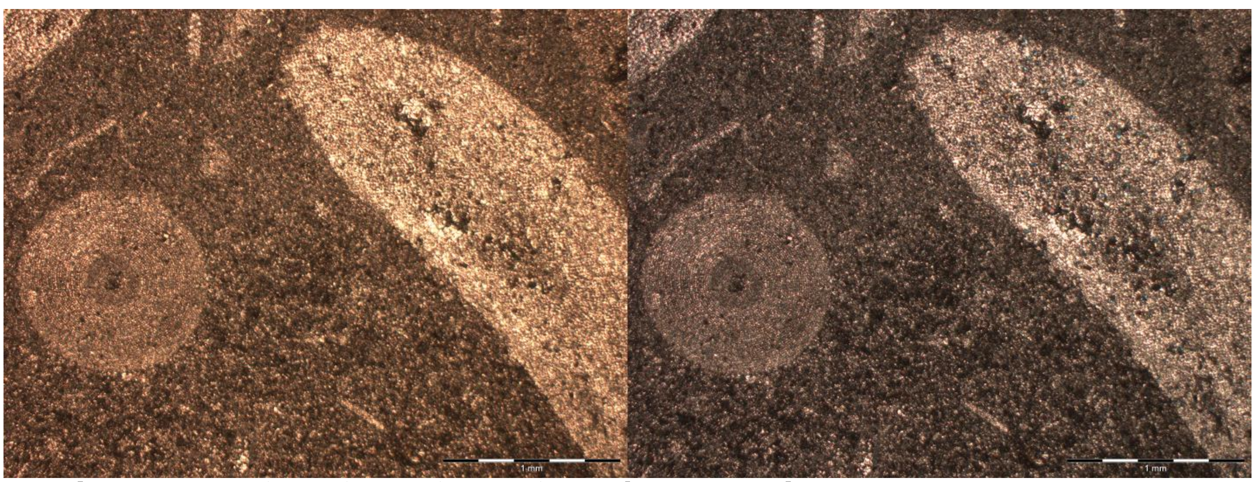


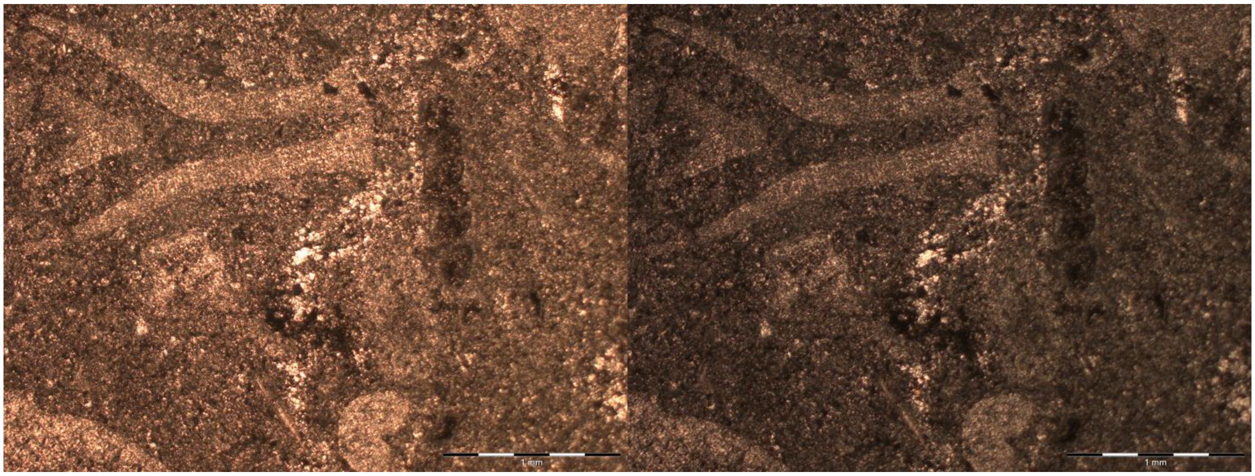
Sample P13B, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.

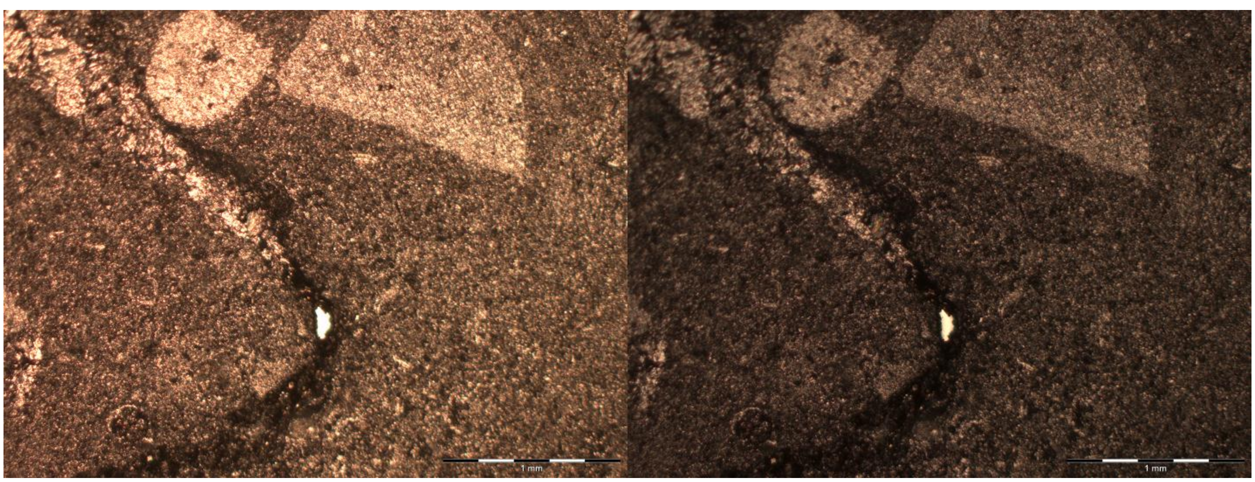


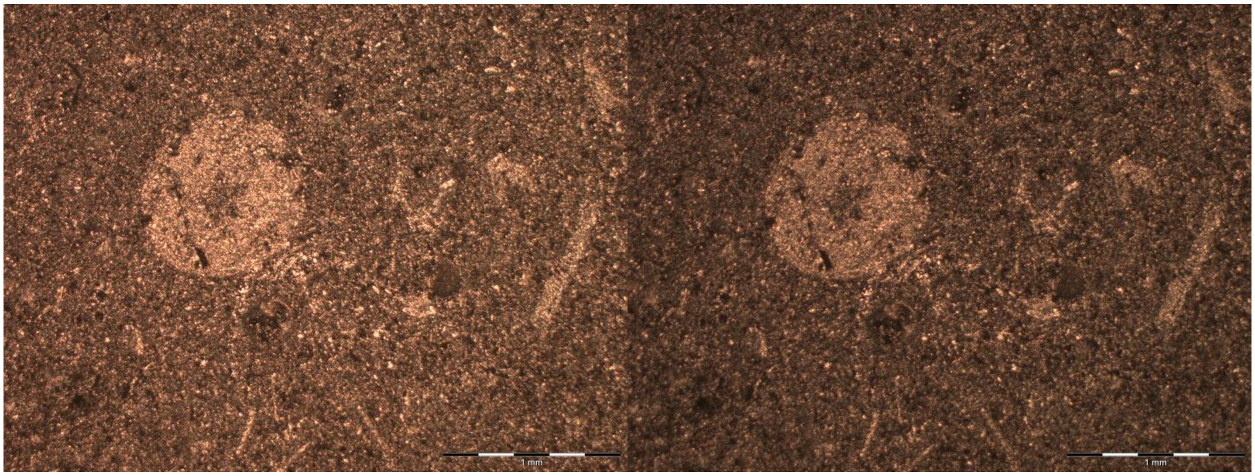
Sample P13C, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.


Sample P14A, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.

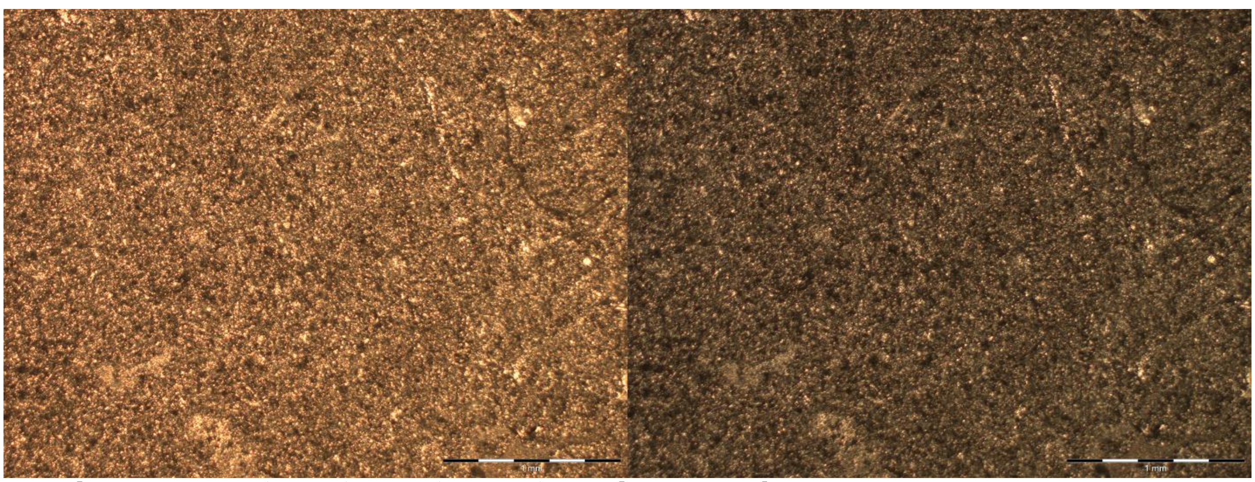

Sample P14B, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.


Sample P14C, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.

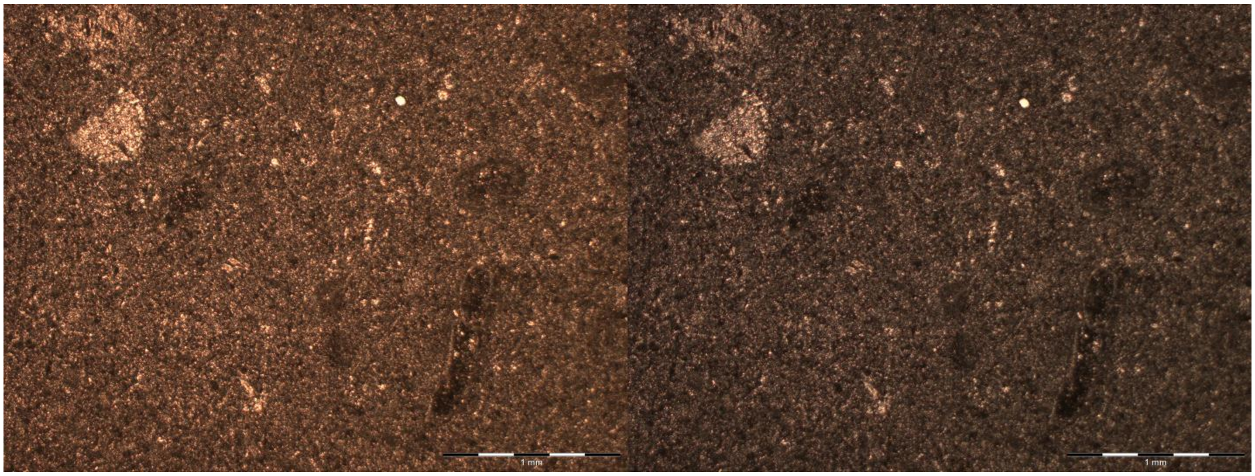

Sample P15A, PPL (LEFT) CPL (RIGHT), Wackestone-Mudstone.



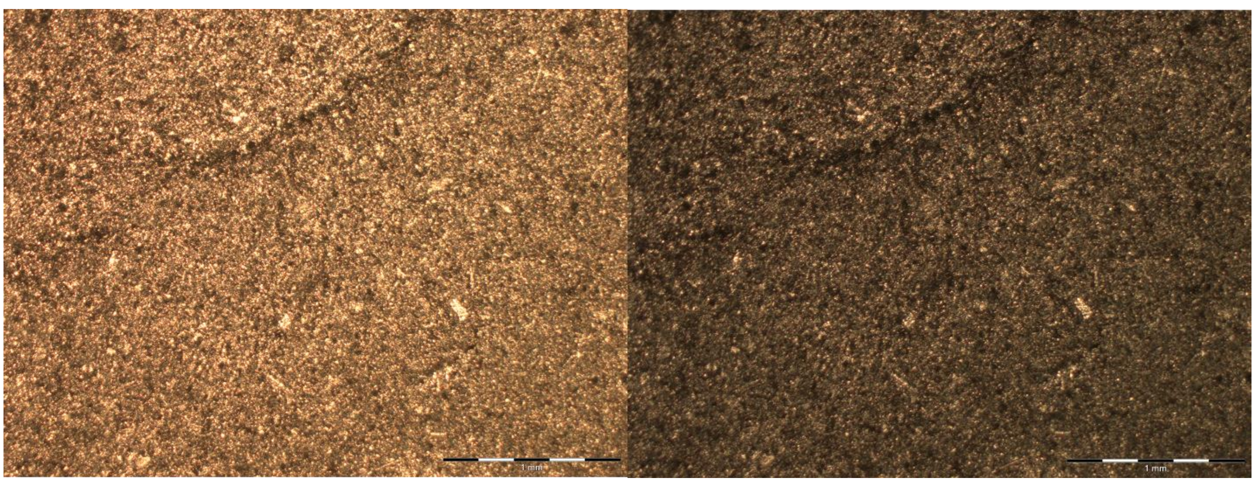
Sample P15B, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone, grain-rich area.



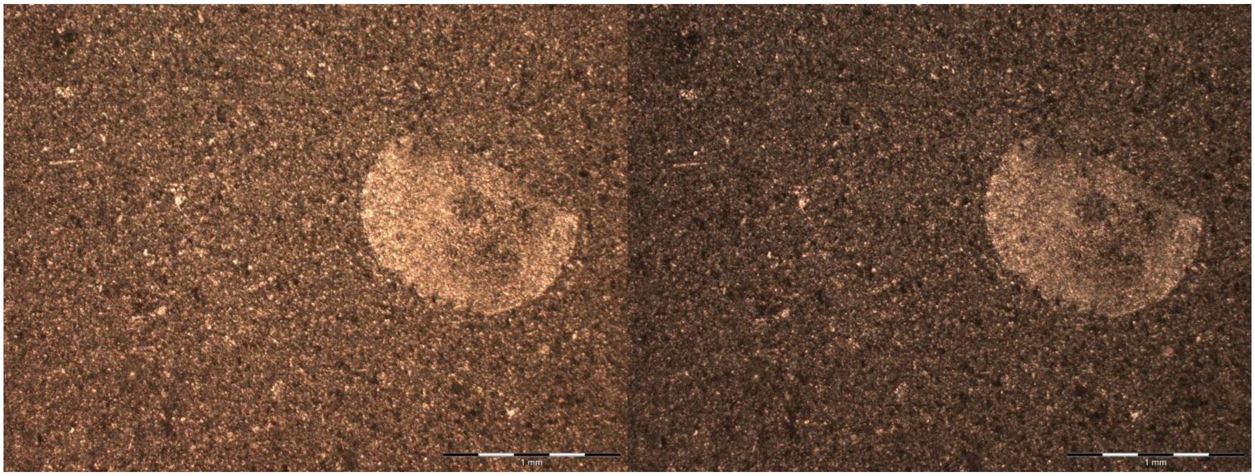
Sample P15B, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone.

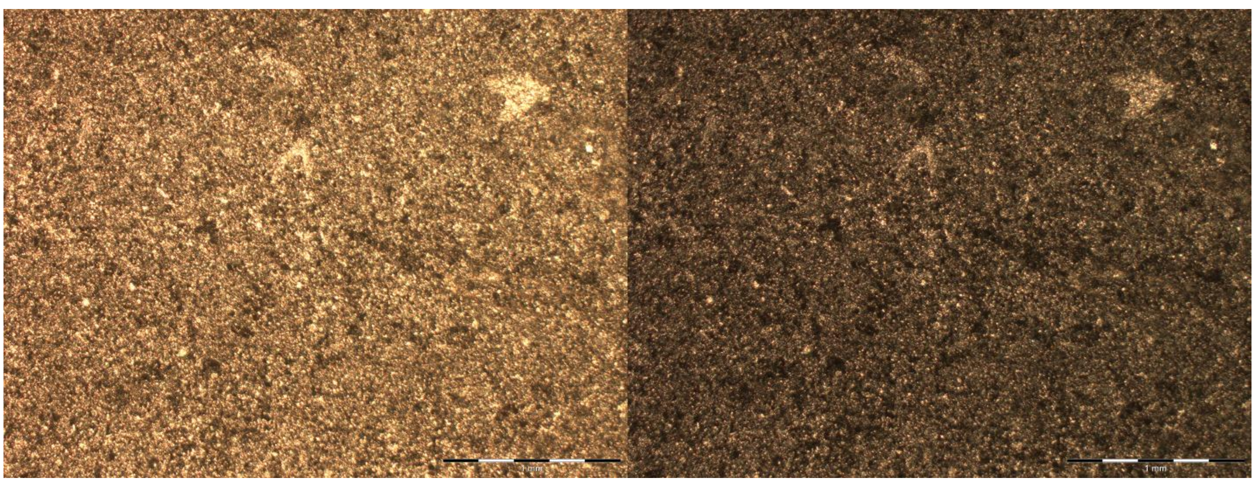


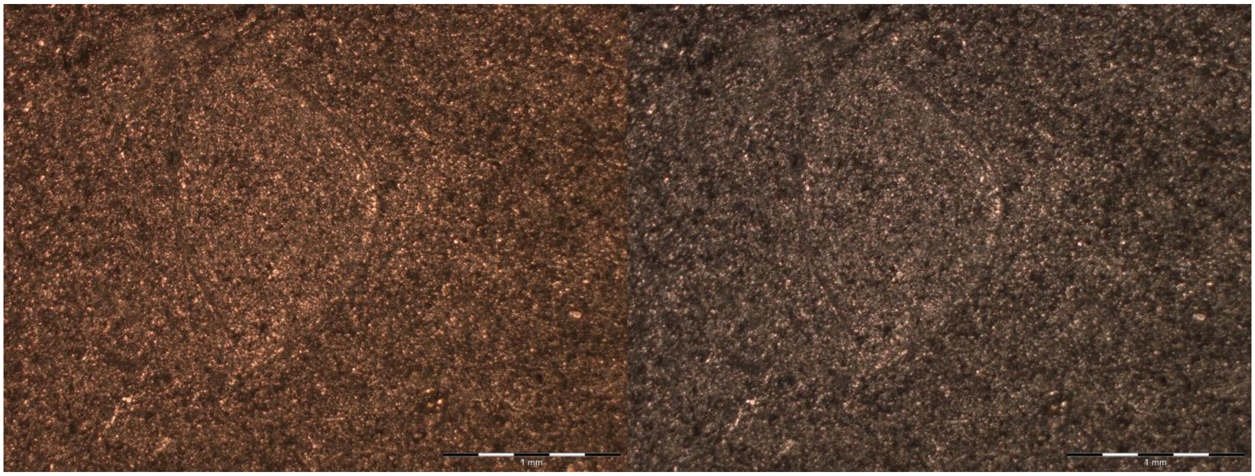
Sample P15C, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone, grain-rich area.



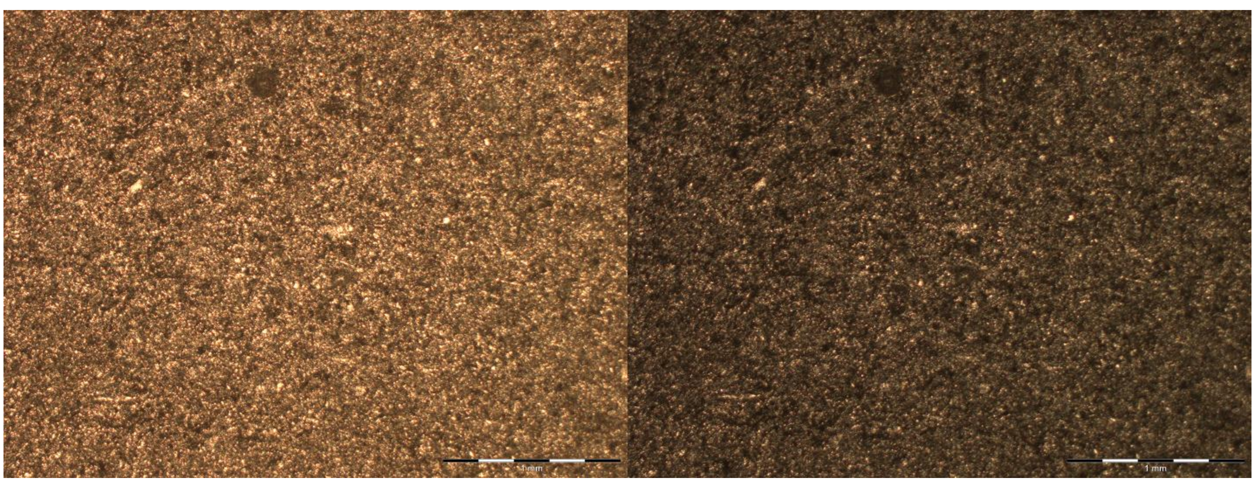
Sample P15C, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone.


Sample P15D, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone.

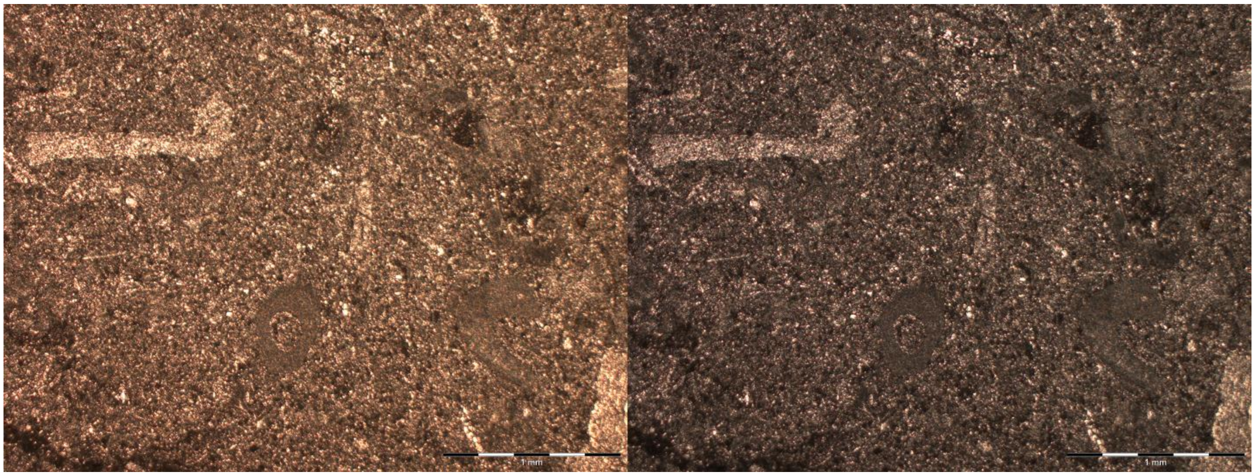

Sample P15D, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone.

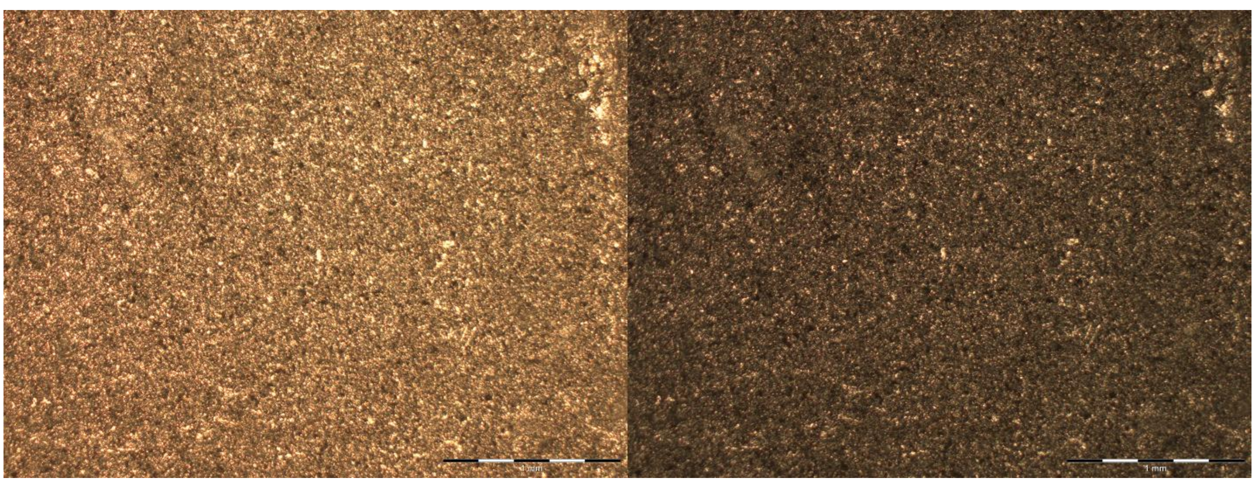


Sample RS1B, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone.



Sample RS1B, PPL (LEFT) CPL (RIGHT), Mudstone-Wackestone.


Sample RS1D, PPL (LEFT) CPL (RIGHT), Mudstone, grain-rich area.


Sample RS1D, PPL (LEFT) CPL (RIGHT), Mudstone.

VITA

Malachi Thomas Ray Lopez

Candidate for the Degree of

Master of Science

Thesis: HIGH RESOLUTION STRATIGRAPHY OF LOWER MISSISSIPPIAN STRATA AT BRANSON NORTH, MISSOURI

Major Field: Geology

Education:

Completed the requirements for the Master of Science in geology at Oklahoma State University, Stillwater, Oklahoma in December, 2012.

Completed the requirements for the Bachelor of Science in geology at Arkansas Tech University, Russellville, AR/United States in 2006.

Experience: Internship at Williams as an exploration geologist summer 2009

Professional Memberships:
AAPG Since 2010

Name: Malachi Thomas Ray Lopez

Date of Degree: DECEMBER, 2012

Title of Study: HIGH RESOLUTION STRATIGRAPHY OF LOWER MISSISSIPPIAN STRATA AT BRANSON NORTH, MISSOURI

Major Field: Geology

Abstract: The primary objectives of this study are to examine the Lower Mississippian rocks at Branson north, Taney County, Missouri, to (i) better understand the Lower Mississippian Subsystem and (ii) determine the sequence boundaries of the system. Additionally, this study aims to identify this location as a type section for the Lower Mississippian strata in North America. . The rocks included in this study are the Bachelor Formation, Compton Limestone, Northview Formation, Pierson Limestone, and Reeds Spring Formation. A total of 67 samples were collected from beds spanning from the bottom of the Compton Limestone to the lower 2 beds of the Reeds Spring Formation. Petrographic examination of these 67 beds determined formation boundaries, textures, and fossil content. Additionally, conodont recovery and identification analyses were performed on these samples along with selected samples from the 2 beds of the Bachelor Formation and bedsets of the Reeds Spring Formation.

After detailed petrographic study and conodont recovery, the section was found to be continuous succession of deposition with no unconformities. The stratigraphic succession suggests that there are 5 major parasequence cycles from the bottom of the Compton Limestone to the top of the Pierson Limestone. The overall pattern of the parasequences shows a retrogradational pattern. Gamma ray data collected at the outcrop was compared to the texture of the outcrop to see if any inferences could be made from the gamma ray. There are gamma ray spikes in the Bachelor Formation and the Northview Formation where shale is present but these measurments give little to no indication of environment or rock texture in the rest of formations. The lack of information provided about the rocks by gamma ray justifies the in depth examination of these rocks on a bed to bed basis.

ADVISER’S APPROVAL: Dr. Darwin Boardman