Although many of the oldest records of the church have been lost or destroyed, it is believed that the church was organized in 1843, thus making it the oldest existing UCC Church in Southeast Missouri. Initially, the congregation may have held services in homes near Whitewater Creek but very soon the congregation began holding services near their present location in Tilsit.

Sometime during the years of 1848 and 1849 a number of individuals from the congregation met in the Tilsit schoolhouse to deliberate about building a German church and school. A council of ten members was chosen in early 1849 thus giving the congregation its formal organization. The congregation purchased twenty acres of land from Henry Nothdurfft at a cost of $36.50 for the purpose of building a church. The first church building, which was a log building, was built about 100 feet west of the present church structure.

The constitution that was adopted by the church in March 1858 was founded on Ephesians 4:3 "Giving diligence to keep the unity of the Spirit in the bond of peace.” It was a very complete constitution and was signed by 57 members of the church. At that time the official name of the church was chosen: German Evangelical Lutheran Reformed Whitewater Congregation of St. James Church. The long name came from a sincere desire not to omit any part of the denominational names that the congregation members had used in Germany.
The church however was known by its shorter name St. Jakob's German Evangelical Church or simply St Jakobi. The English translation of the name Jacob is James. In later years the name of the church was changed to St. James.

In 1891 the congregation adopted a new constitution and became a member of the Evangelical Synod of North America. On June 27, 1891 the church incorporated as the German Evangelical St. James Church of Tilsit, Missouri.

Later that same year the church purchased a church bell. The bell was delivered to August Peetz on December 22, 1891 at a cost of approximately $300.00. The bell was used at the old church where it stood outside on an old post. Later the bell was moved to the new church building and is still being rung before Sunday service today.

In 1896 the congregation purchased additional land and built a new church building. Also that year the congregation purchased a Mason and Hamlin cabinet organ, which is still housed in the church today. Then in 1898 a new schoolhouse was built adjacent to the church.

During the late 1800's and early 1900's the worship services of St James were conducted in German. Later the German services were held only once a month and eventually discontinued altogether.

Throughout its history approximately 40 ministers, student pastors and laypersons have served the church. At times the church has shared a pastor with another sister church. In recent years, both the church building and the schoolhouse have been refurbished. There's a wonderful attitude of welcome and growth found in this small church that has lasted through 175 years.