In Alaska villages along the Kuskokwim River, Yup’ik hunters follow a rigorous schedule for subsistence hunting and trapping of animals, gathering of herbs and berries and ice fishing. Between October freeze-up and April break-up, they travel by snowmachine long distances across the tundra to hunt, trap and gather berries. Snow covers the tundra with a white blanket that is continually stirred up by the strong winds. During long winter nights they navigate across the tundra using stars, frozen grass, tree growth and snow waves to guide their way (Bradley, 2002).

Trained by his father since he was a young boy, Fred George has become a highly skilled navigator of the tundra with 60 years of experience. Currently an Elder of 68 years, he lived with his wife Mary in Akiachak until she passed away in November of 2000. Fred and Mary have eight children and many grandchildren. Nearly everyday Fred leaves to attend to his subsistence responsibilities and returns home with lots of fish and sometimes caribou or ptarmigan. His subsistence activities feed not just his family, but his extended family and sometimes friends.

The following is an interpretation of how Fred George manages to navigate 90 miles across the tundra at night. It is based on the many discussions shared by Fred George and other Elders, Yup’ik teachers and UAF faculty together with the author’s experiences on the tundra and investigations of star behavior.

On November 10 at 10 P.M. Fred George begins his first trip of the season across the tundra. At that moment Tunturyuk (Big Dipper) hovers 30 degrees above the northern horizon, like a giant spoon sitting on a table. Scientists have identified the seven stars in the Big Dipper (from right to left) as alpha, beta, gamma, delta, epsilon, zeta and eta star. The Gamma Star sits directly over due north on the horizon in Akiachak on November 10 at 10 P.M. This position of the dipper is a reference position for Fred George.

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Before leaving Akiachak Fred carefully checks his snowmachine for gas and working parts. He loads his machine with hunting equipment, dresses warmly and starts his snowmachine shortly before 10 P.M. He heads out of the village using snow-machine trails heading north. About five miles away from the village at 10 P.M. Fred stops his snowmachine to check the time on his watch and the position of Tunturyuk (Big Dipper).

Fred George checks the position of the third star, Gamma, in the Tunturyuk with a sequence of hand measurements. He uses his right “hand span” with the tip of his thumb at Gamma Star and his pinky pointing down to the horizon. Fred keeps the tip of the pinky in stable position while closing his fingers and rotating his hand downward using “four-finger measurement.” He keeps the index finger in stable position and rotates his hand downward using “three-finger measurement” which puts the ring finger at the horizon. The tip of his ring finger locates true north on the horizon.

Fred chooses one of two routes, which lead to his fish camps. If the weather has little or no snow falling or strong winds blowing, he will choose to travel to the northwest fish camp by heading in the direction under the Dipper handle on November 10 at 10 P.M. This direction turns out to be just less than 30 degrees west of north.

If the weather is moderate with some snowfall, clouds and wind (but not completely overcast), Fred will choose his second route and travel due north for two hours and turn northeast under the dipper handle, towards his other fish camp on the Yukon River. By 12 midnight the Dipper has moved to the right and the Dipper handle is over true north on the horizon. His watch tells the direction he needs to turn, which is 30 degrees west of due north.

If the weather is very bad, Fred waits until the storm is over. The Elders do not travel in stormy weather. If a storm comes when they are out on the tundra, they build a snow cave to wait out the storm. This is one reason why weather prediction skills are so important to develop starting at the young age of eight years old. Young boys are told to observe the weather at sunrise and sunset every day. A skilled Elder can predict the weather for the next 12 months.

The tundra has a countless number of lakes between the Kuskokwim and the Yukon Rivers. Every lake has been given a Yup’ik name. The lake names are family names given to the lake for the family’s historic use of the lake for fishing and camping. The northeast winds make waves in every lake. The waves freeze in position. The October snow falls over the frozen waves and becomes hard snow; making snow waves rolling in the southwest direction over the lakes. Fred George travels on his snowmachine at 15–20 miles per hour and uses the snow waves to find his direction. He feels the waves kinesthetically with the movement of his snowmachine traveling over the waves. If the snowmachine changes its direction Fred can feel a change in the rhythmic motion. He has learned to maintain the rhythmic motion to retain his course. Fred relies heavily on the snow waves when the sky becomes overcast or the weather is somewhat stormy. However, if the weather is
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generally in isolated spots. The heavy winds cause the trees to also lean in the southwest direction and to grow most of their branches and leaves on the northeast side of the tree, leaving the wind with the movement of his snowmachine traveling over the waves. He checks his snowmachine which is heading 5 minutes (11 on his watch) to the left of north (12 on his watch), i.e. 30 degrees west of north. With the 12 heading toward the dipper handle hovering over true north his snowmachine must head in the direction of 11 on his watch, or 5 minutes to the left 12, which is 30 degrees west of north.

He checks the landmarks recognizing the frozen streams and distant mountains. The strongest winds come from the northeast direction. On the first day of snow the wind blows the grass in one direction. Generally the grass is blown to the southwest. The weight of the snow holds the grass in the direction of the wind and the cold temperatures freeze the grass. Frozen grass becomes a natural compass on the tundra. Fred can use the grass to determine his direction.

Another two hours has passed and it’s time for Fred to check his watch and the Big Dipper. The Dipper handle has moved upward and east. It appears parallel to a north direction. Fred will hold his hands up so that one is in the north direction and the other is in the direction of the dipper handle. By 4:00 a.m. Fred has reached his fish camp. He needs to build a fire, eat, set up his tent and go to sleep.

On clear or even partially cloudy nights Fred navigates with the Tunturyuk in the late evening and Venus, the morning star, in the morning. In February and March Fred navigates with Venus, the evening star in the evening and in the morning. Fred generally remains home in Akiachak during the coldest month, January.

On his return home in the morning Venus is east and on his left when he faces south. Facing south he places his watch in front of his chest, so that 9 marks the east direction, 12 marks the south and 3 marks the west. Fred knows that Akiachak would be 5 minutes (30 degrees) east of south, i.e., in the direction of 11 on his watch.

Heading 5 minutes to east of south, Fred feels the motion of his snowmachine over the snow waves. He maintains the motion to keep in the direction of Akiachak. The snow waves are perpendicular to the southwest direction. Since his snowmachine is traveling southeast. The left side of the front end rises up first, tilting the snowmachine down on the right side. As the snowmachine goes over the top, the tilt reverses. This motion simulates a boat rocking in the ocean.

Elders say young people are not spending time and listening to Elders as they did in the past to learn their cultural ways and stories. Yet they drive snowmachines out on the tundra and many get lost, run out of gas and cannot find their way home. Fred’s knowledge of the stars and the tundra environment would give them a chance to survive.

Preserving Fred’s knowledge of navigating across the tundra is important to the self-esteem and cultural identity of Yup’ik people. A study of Fred’s ways of navigating across the tundra uncovers the wisdom, courage and ingenuity of his Yup’ik ancestors.

For the rest of our society, Fred’s knowledge will enhance any person’s library of way-finding or orienteering, plus his knowledge of the stars helps us understand how they move in relation to time. We can use the stars to find our way and tell what time it is.