

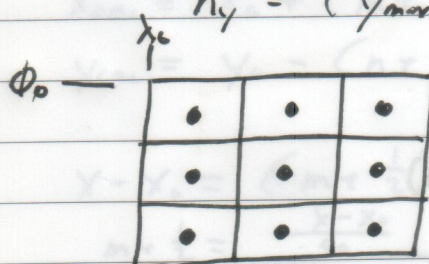
USGS GTOPO30 DEM files

- pixel node registration
- 30 arcsec cells
- grid starts at top left
- grid numbers are 2-byte integers
- byte order probably needs to be reversed

for pixel registration,

$$n_x = (x_{\max} - x_{\min}) / x_{\text{inc}}$$

$$n_y = (y_{\max} - y_{\min}) / y_{\text{inc}}$$



$$x_{\text{inc}} = 0.5 \text{ arcmin} \left(\frac{1 \text{ deg}}{60 \text{ arcmin}} \right)$$

$$= 0.008333 \text{ deg}$$

$$y_{\text{inc}} = x_{\text{inc}}$$

$$n_x = 4800 \quad n_y = 6000$$

for W100N40

$$-100 < \text{lon} < -60$$

$$-10 < \text{lat} < 40$$

$$\lambda_{\text{cell}} = \lambda_0 + \left(m + \frac{1}{2}\right) \left(\frac{1 \text{ deg}}{120}\right)$$

$$\phi_{\text{cell}} = \phi_0 + \left(n + \frac{1}{2}\right) \left(\frac{1 \text{ deg}}{120}\right)$$

$$m = \left(\frac{120}{1 \text{ deg}} \right) (\lambda - \lambda_0) - \frac{1}{2}$$

$$n = \left(\frac{120}{1 \text{ deg}} \right) (\phi_0 - \phi) - \frac{1}{2}$$

For BEDMAP2

$$X_0 = -3333500$$

$$Y_0 = 3333500$$

$$X_{\text{cell}} = X_0 + \left(m + \frac{1}{2}\right)(1000)$$

$$Y_{\text{cell}} = Y_0 - \left(n + \frac{1}{2}\right)(1000)$$

$$X - X_0 = \left(m + \frac{1}{2}\right)(1000)$$

$$m + \frac{1}{2} = \frac{X - X_0}{1000}$$

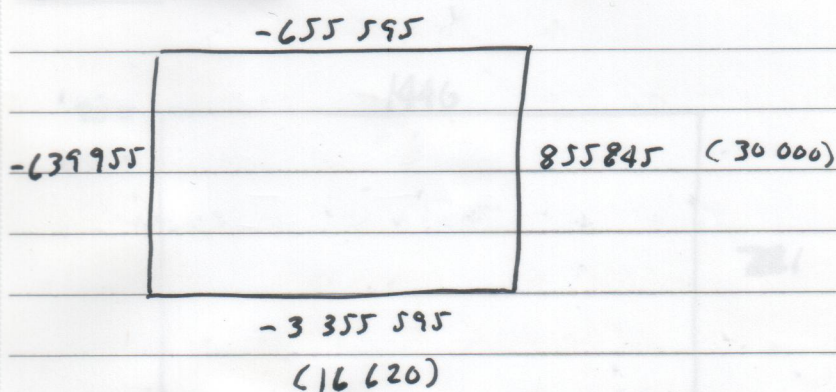
$$m = \frac{X - X_0}{1000} - \frac{1}{2}$$

$$Y - Y_0 = -\left(n + \frac{1}{2}\right)(1000)$$

$$n + \frac{1}{2} = \frac{Y_0 - Y}{1000}$$

$$n = \frac{Y_0 - Y}{1000} - \frac{1}{2}$$

Gimp 90m



$$x_0 = -639 955$$

$$y_0 = -655 595$$

$$x_{cal} = x_0 + (m + \frac{1}{2})(90)$$

$$y_{cal} = y_0 - (n + \frac{1}{2})(90)$$

$$x - x_0 = (m + \frac{1}{2})(90)$$

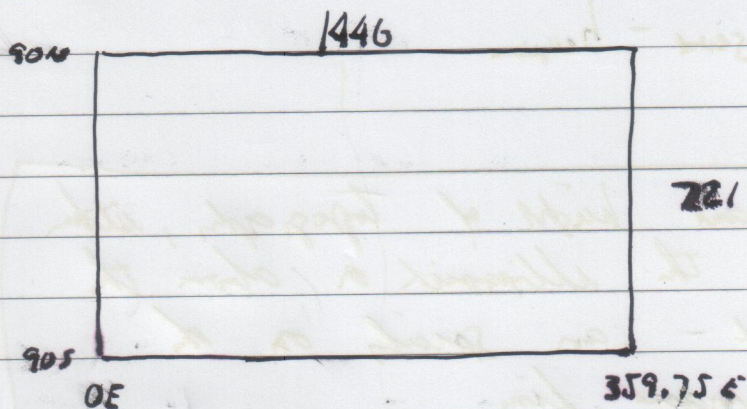
$$m + \frac{1}{2} = \frac{x - x_0}{90}$$

$$m = \frac{x - x_0}{90} - \frac{1}{2}$$

$$n + \frac{1}{2} = \frac{y_0 - y}{90}$$

$$n = \frac{y_0 - y}{90} - \frac{1}{2}$$

EGM 96



$$15 \text{ arcmin} = 0.25 \text{ deg}$$

$$lon = 0.00 \quad 0.25 \quad 0.50 \quad 0.75 \quad 1.00 \quad \dots \quad 359.75$$

$$lat = 90 \quad 89.75 \quad 89.50 \quad 89.25 \quad \dots \quad -90$$

$$X_0 = 0 \quad 0 \leq m < 1440 \quad 0 \dots 1439$$

$$Y_0 = 90 \quad 0 \leq n < 721 \quad 0 \dots 720$$

$$X_{cell} = X_0 + m(0.25)$$

$$Y_{cell} = Y_0 - n(0.25)$$

$$m = 4(X_{cell} - X_0)$$

$$\frac{m}{4} = X_{cell} - X_0 \Rightarrow m = 4(X_{cell} - X_0)$$

$$\frac{n}{4} = Y_0 - Y_{cell} \Rightarrow n = 4(Y_0 - Y_{cell})$$