

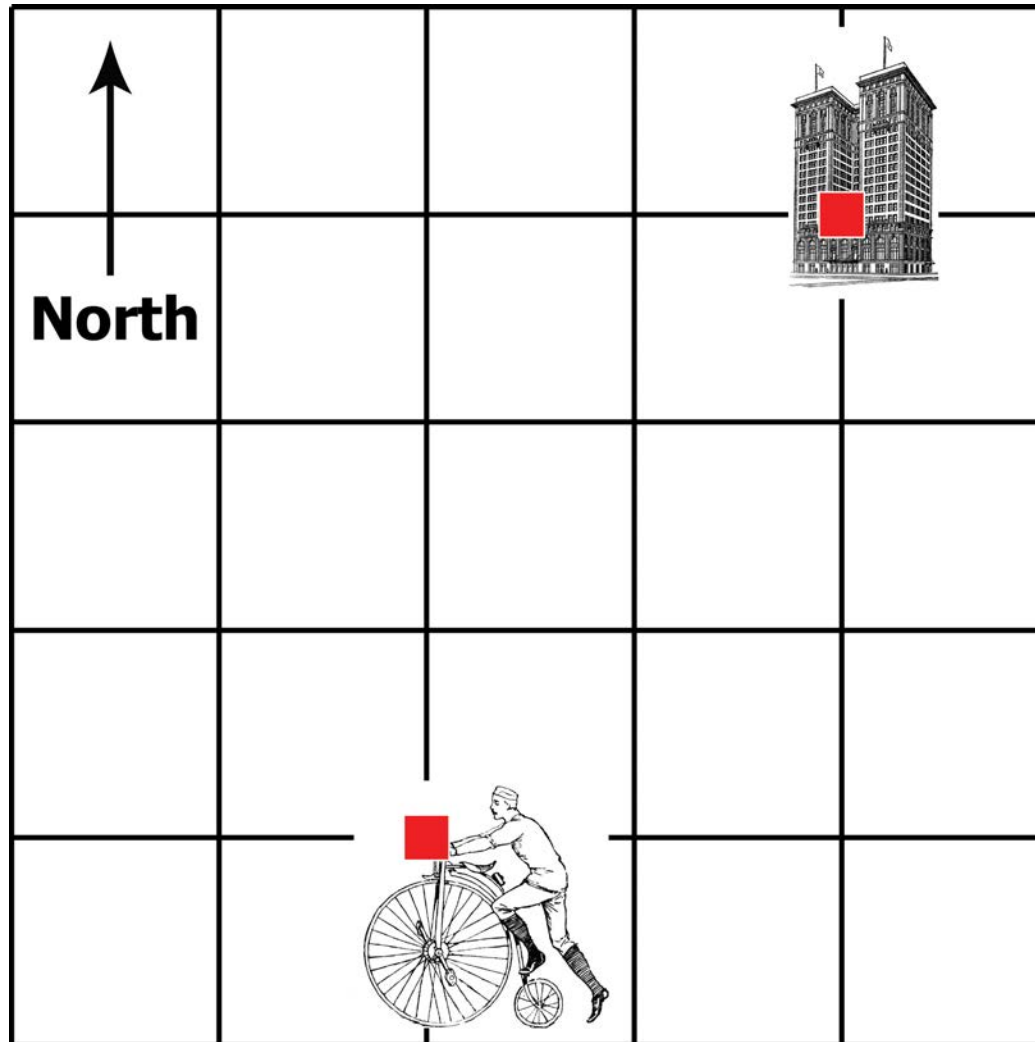
The background of the slide is a red-toned topographic map. It features a central, irregularly shaped landmass with a dark, possibly forested or water-filled interior. The surrounding areas are characterized by a dense network of lines representing topographic contours or drainage patterns. The overall texture is rugged and detailed.

Introduction to Graphing of GPS Data

Roger Groom, Cate Fox-Lent and Shelley Olds.
Revised by Nancy W. West & Kathleen Alexander

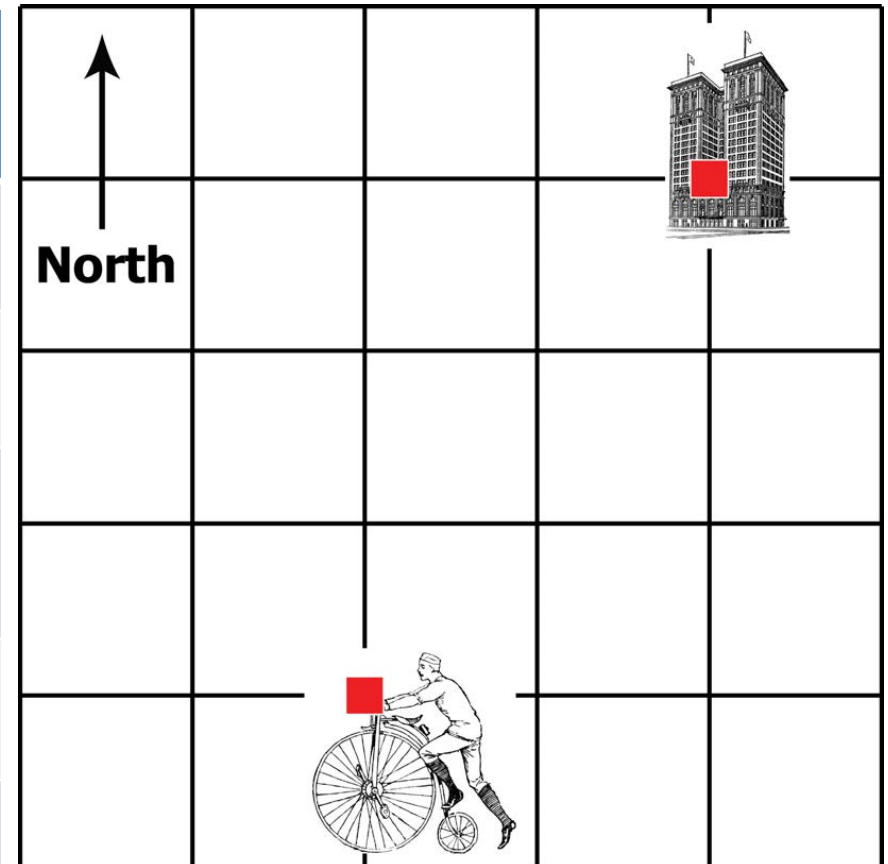
UNAVCO 

Biking through the city



Jose's route through the city

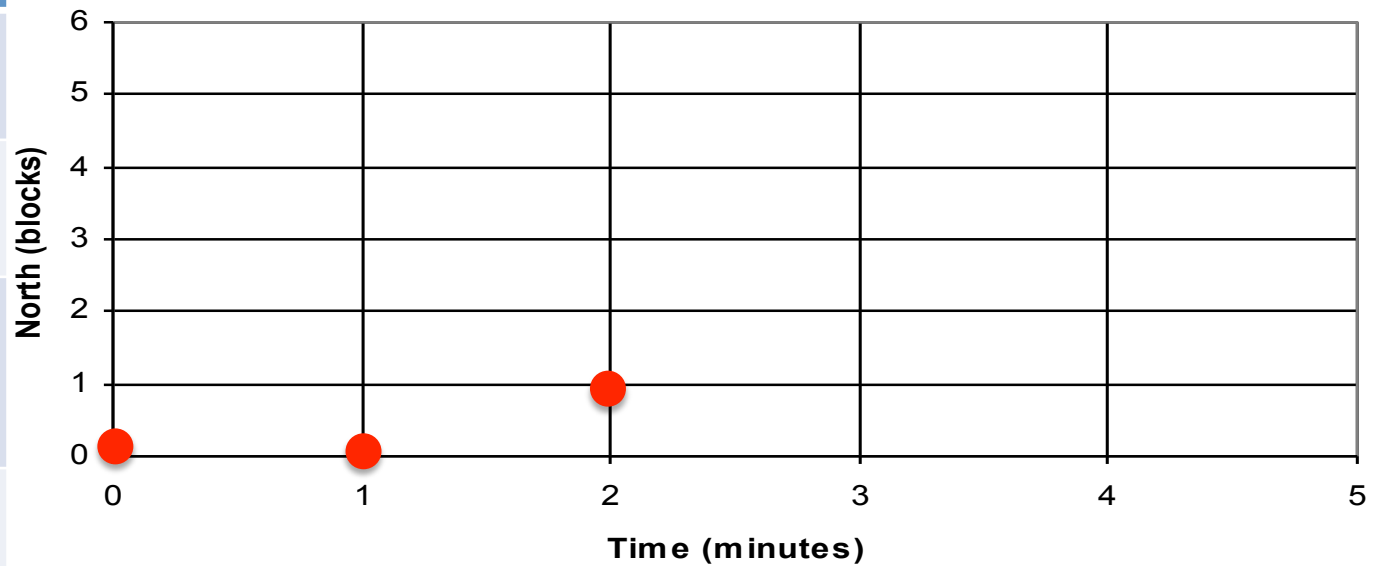
Time (minutes)	North (blocks)	East (blocks)
0	0	0
1	0	0.5
2	1	1
3	2	1.5
4	3	2



Plot the north positions of the route

Time (minutes)	North (blocks)
0	0
1	0
2	1
3	2
4	3

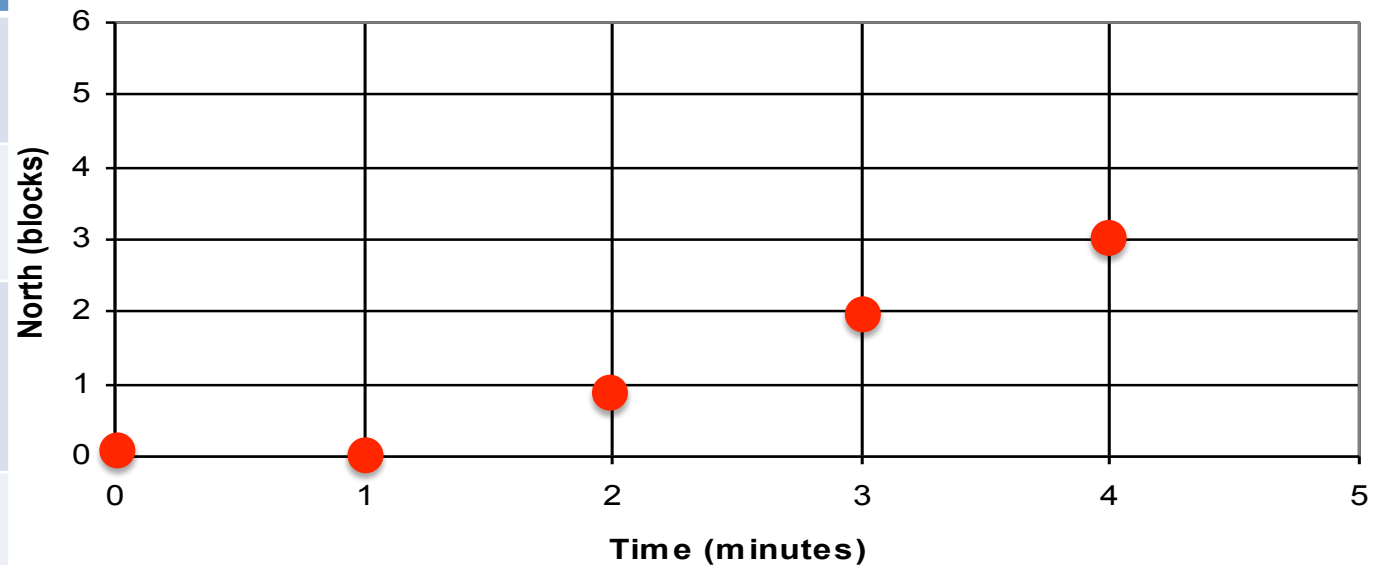
North vs Time



Plot the north positions of the route

Time (minutes)	North (blocks)
0	0
1	0
2	1
3	2
4	3

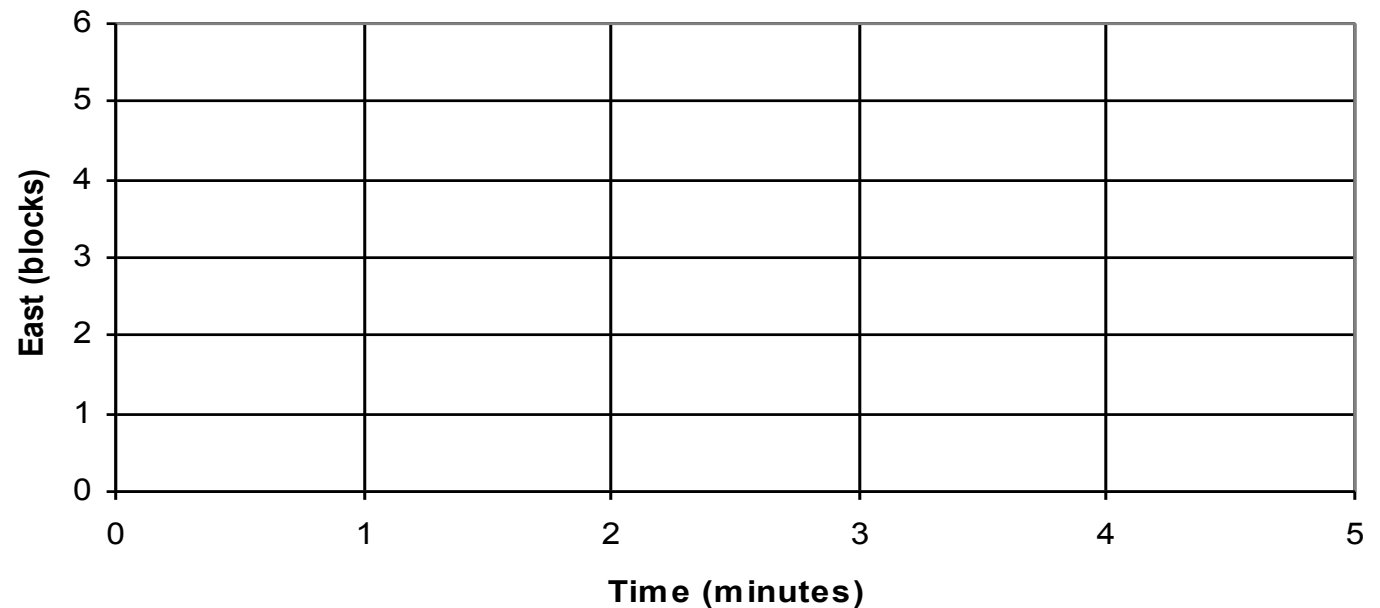
North vs Time



Plot the east positions of the route

Time (minutes)	East (blocks)
0	0
1	0.5
2	1
3	1.5
4	2

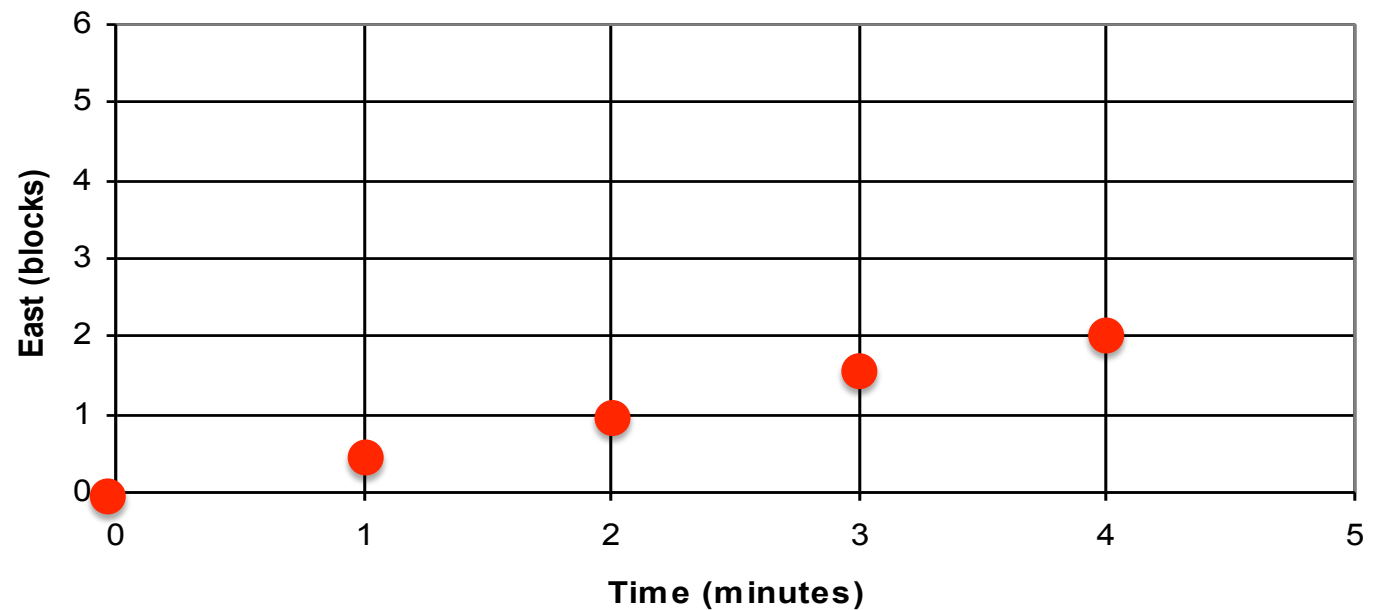
East vs Time



Plot the east positions of the route

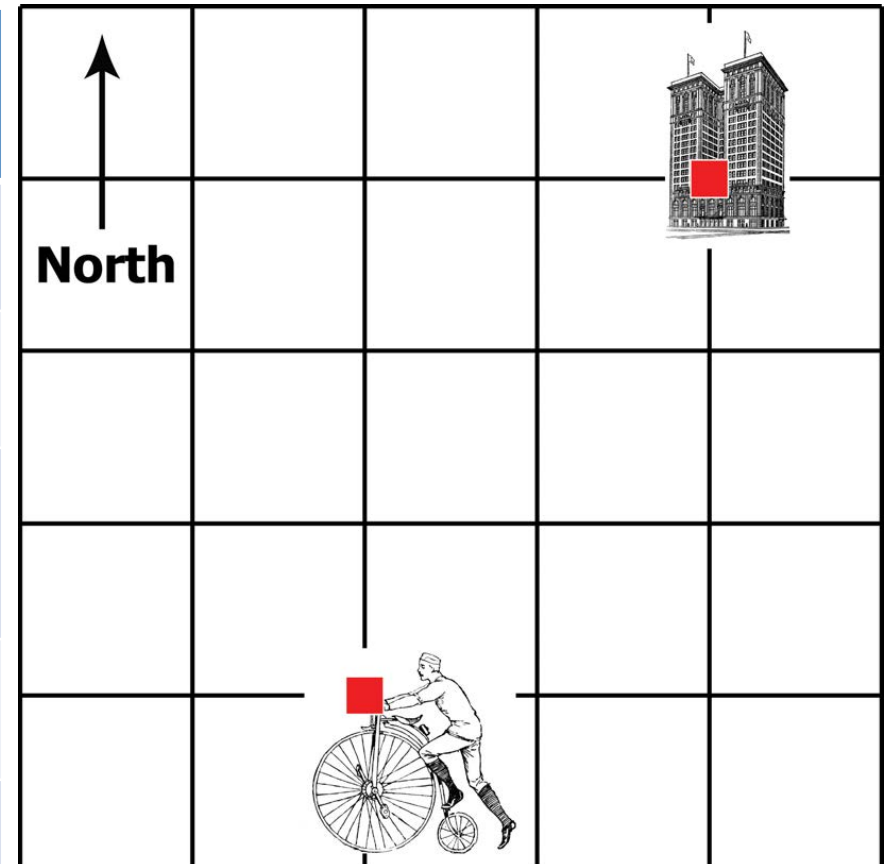
Time (minutes)	East (blocks)
0	0
1	0.5
2	1
3	1.5
4	2

East vs Time



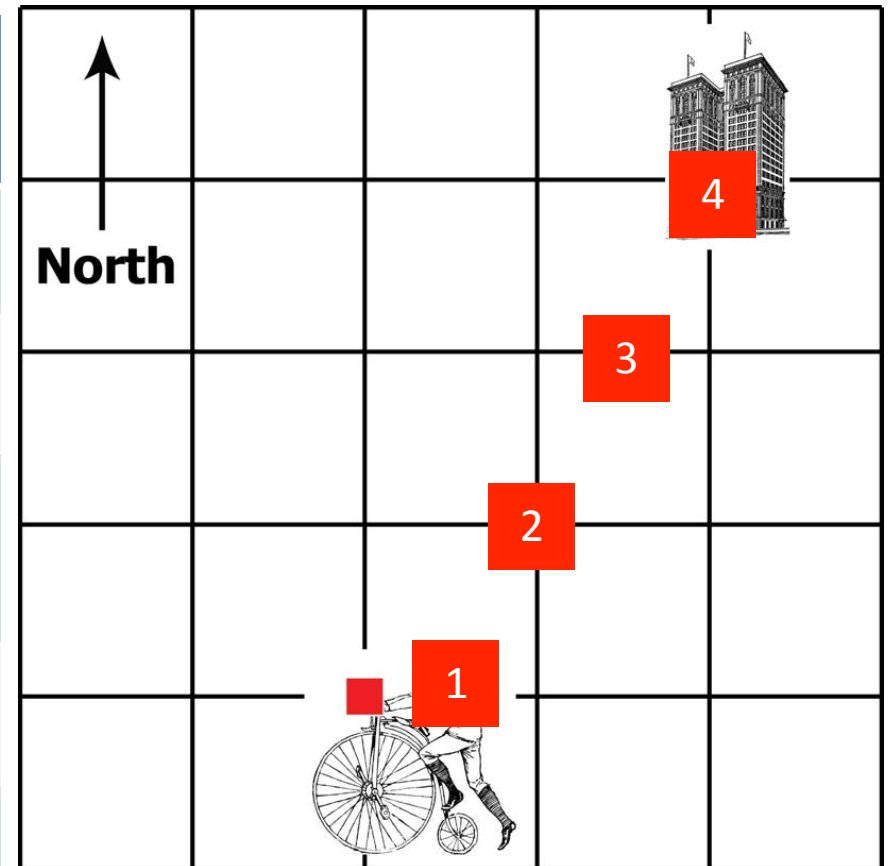
Plot North and East position after each minute

Time (minutes)	North (blocks)	East (blocks)
0	0	0
1	0	0.5
2	1	1
3	2	1.5
4	3	2

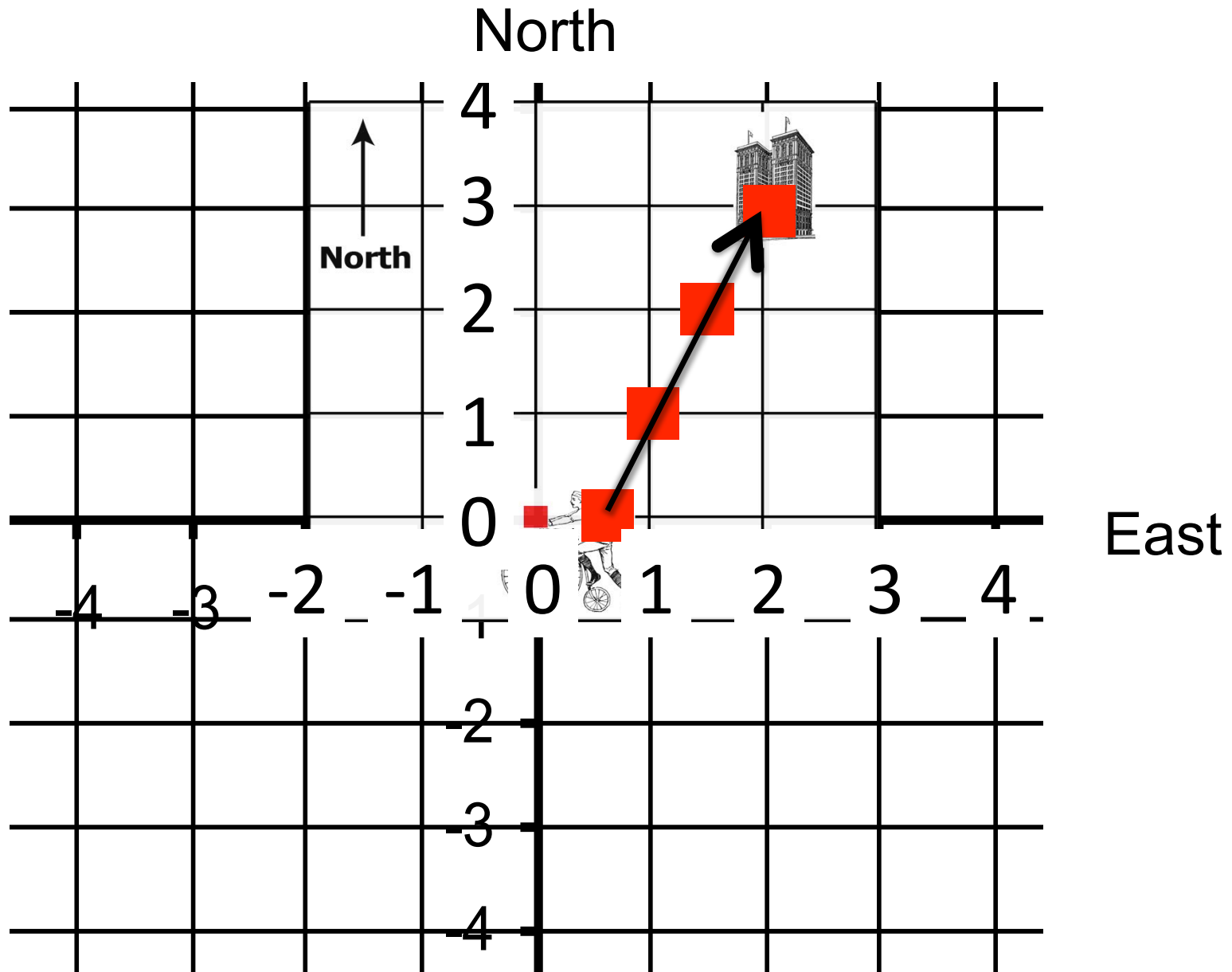


Jose's route through the city

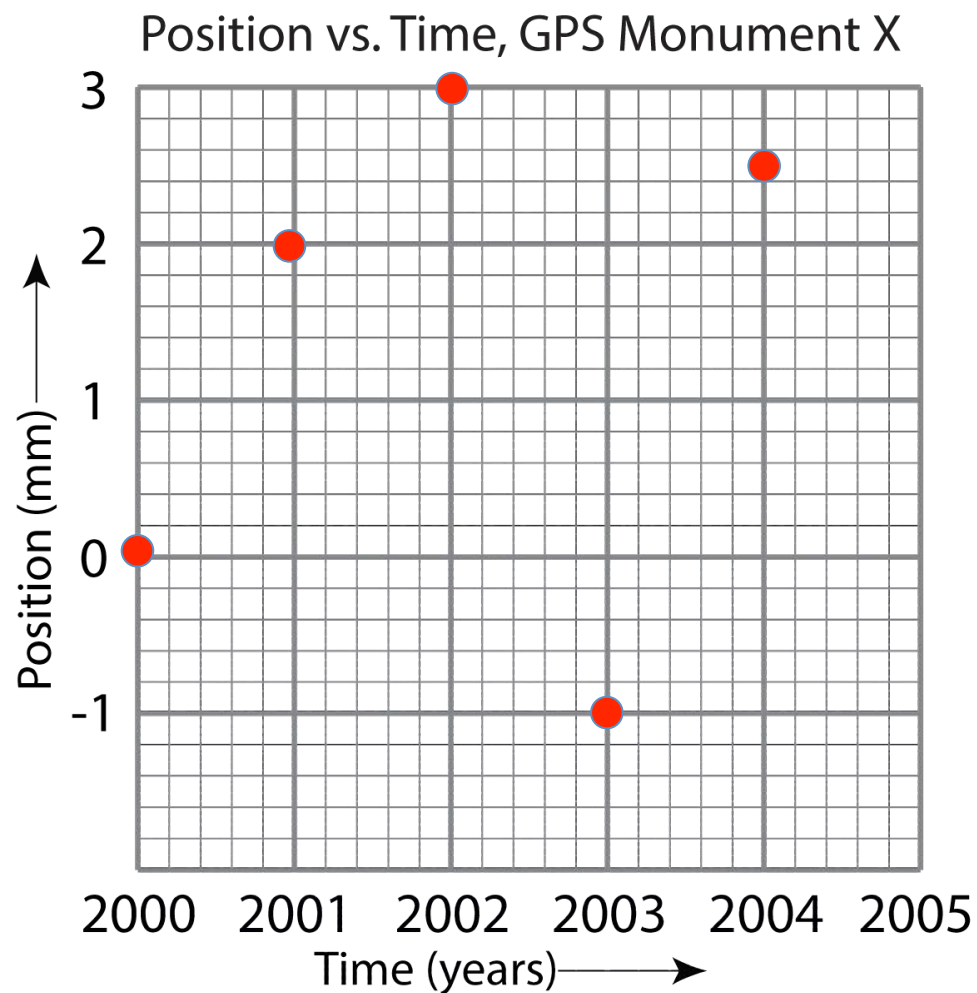
Time (minutes)	North (blocks)	East (blocks)
0	0	0
1	0	0.5
2	1	1
3	2	1.5
4	3	2



Jose's route through the city

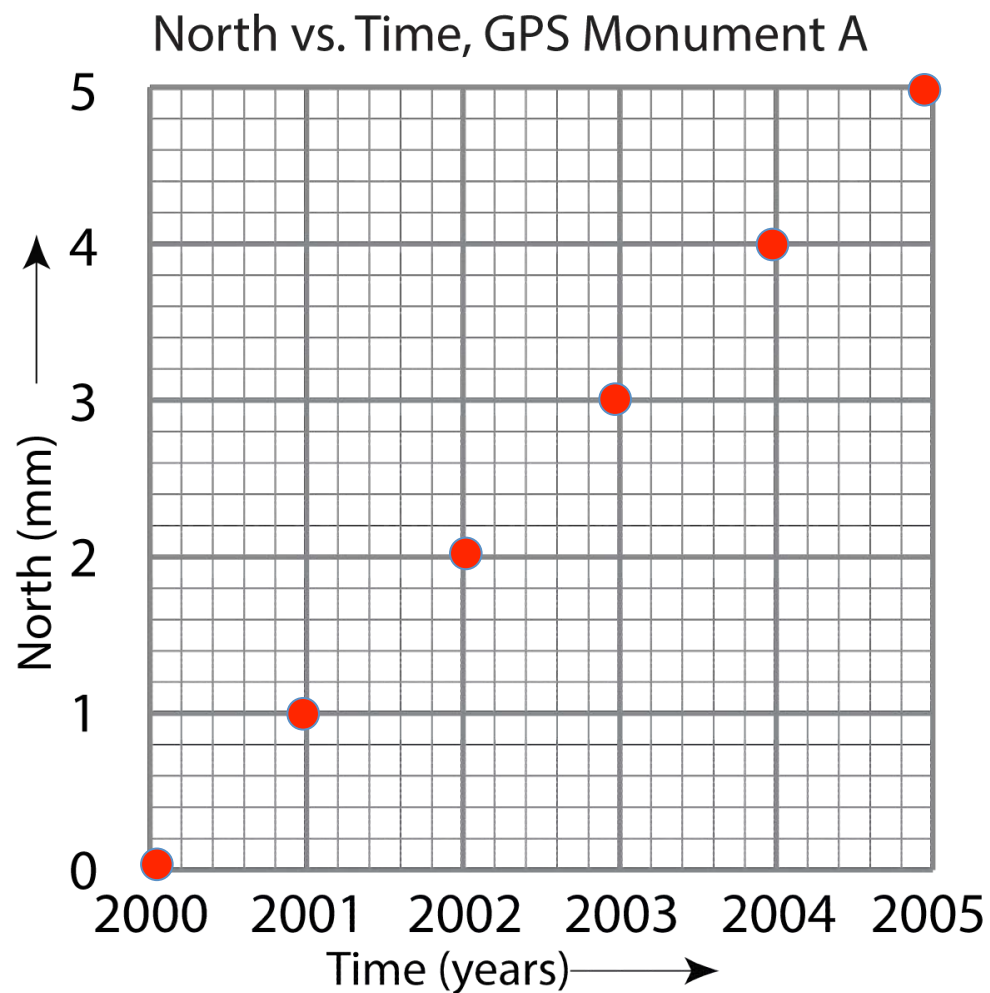


Year	Position
2000	0
2001	2
2002	3
2003	-1
2004	2.5
...	...

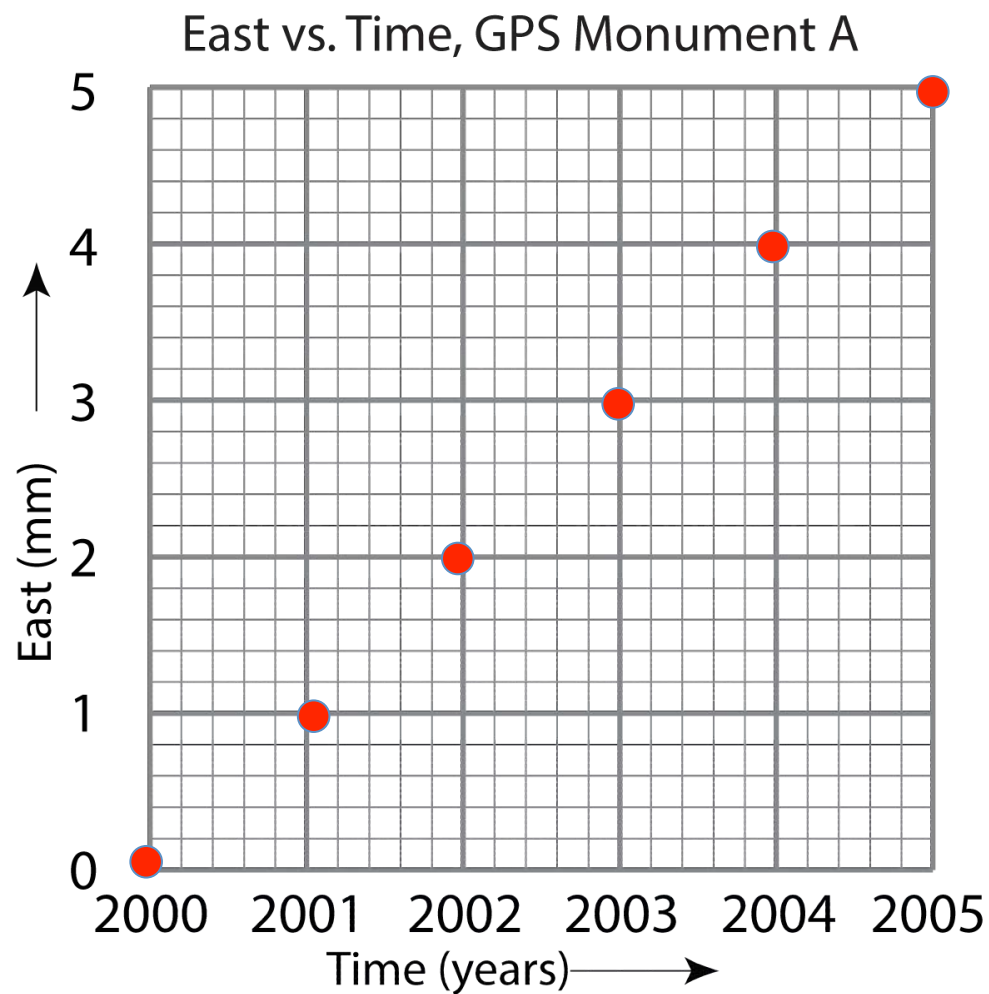


Year	North (mm)	East (mm)
Jan 2000	0	0
2001	1	1
2002	2	2
2003	3	3
2004	4	4
2005	5	5
...

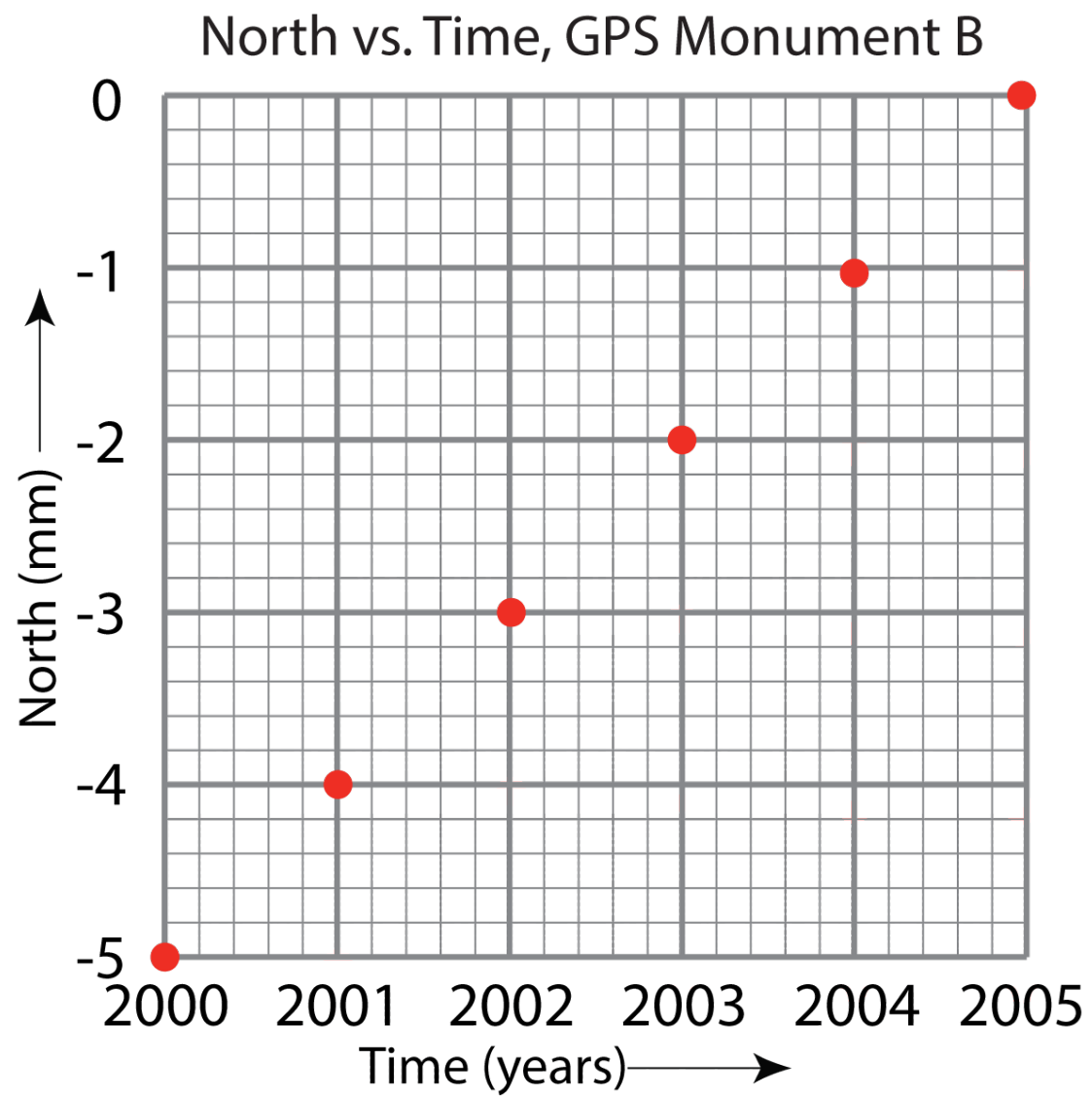
Year	North Position (mm)
2000	0
2001	1
2002	2
2003	3
2004	4
2005	5
...	...

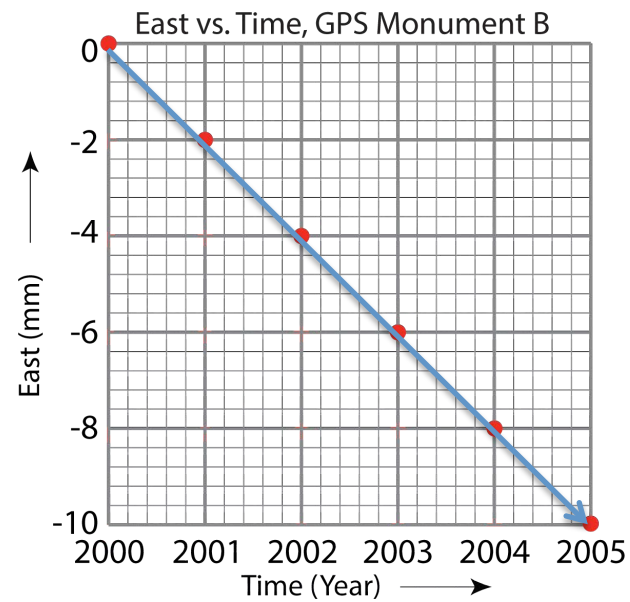
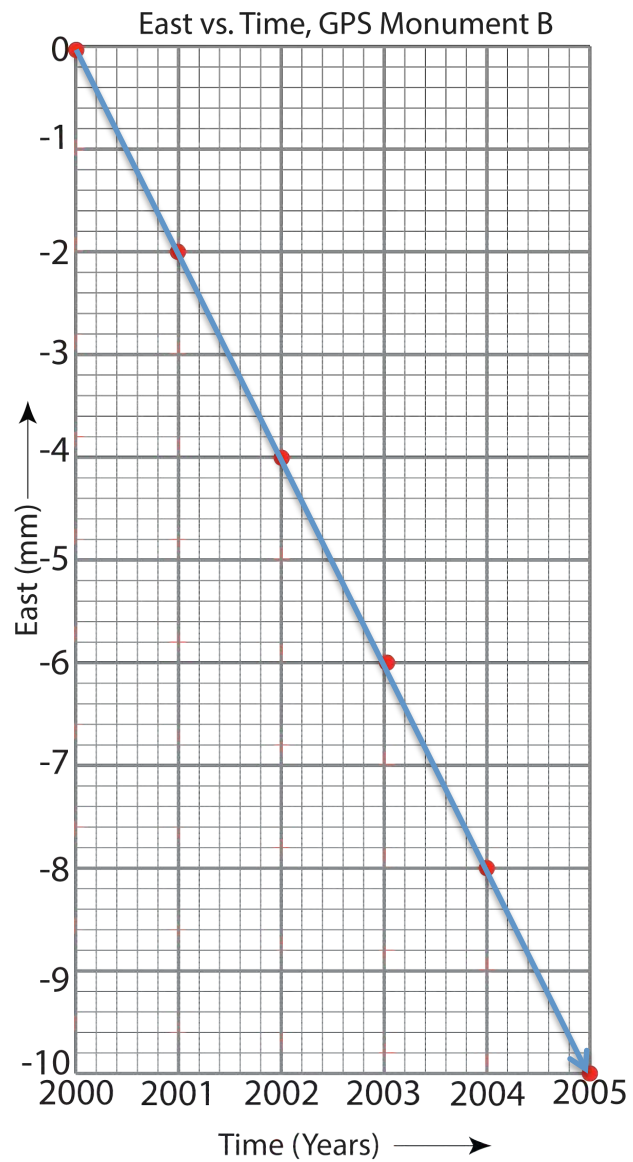


Year	East Position (mm)
2000	0
2001	1
2002	2
2003	3
2004	4
2005	5
...	...



Year	North Position (mm)	East Position (mm)
2000	-5	0
2001	-4	-2
2002	-3	-4
2003	-2	-6
2004	-1	-8
2005	0	-10
...		...

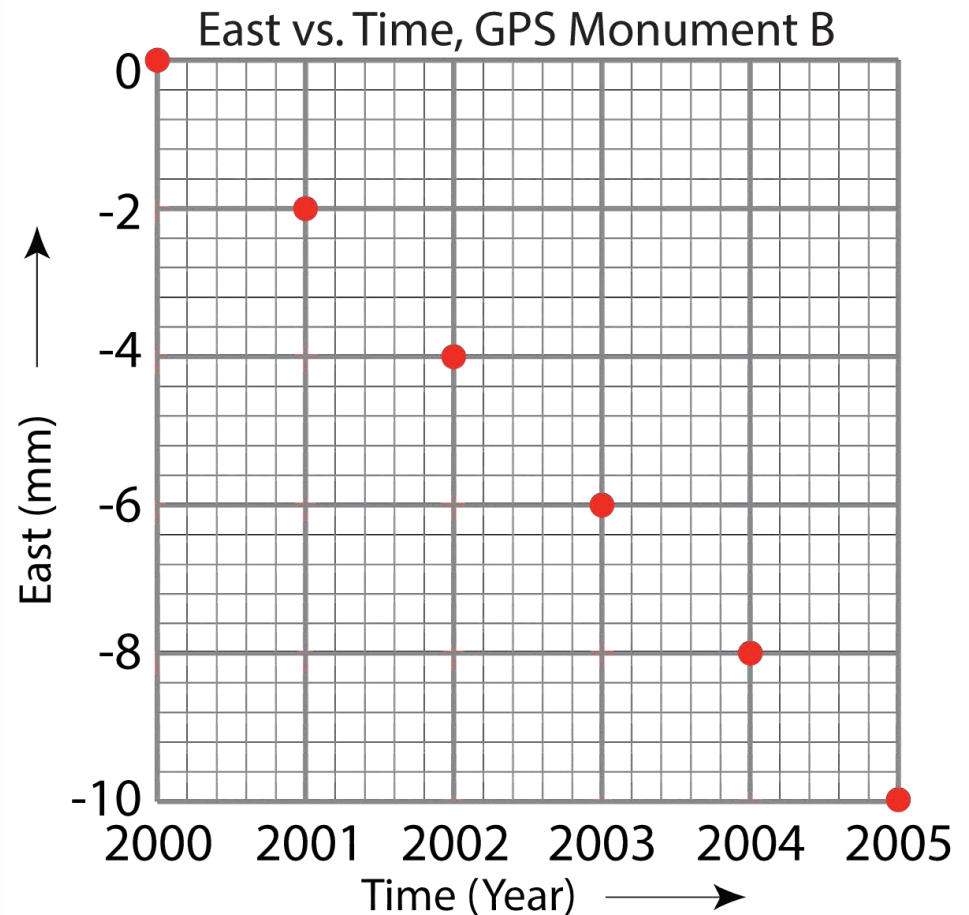




Graphs are usually set up so that the horizontal axis represents values independent of our control.

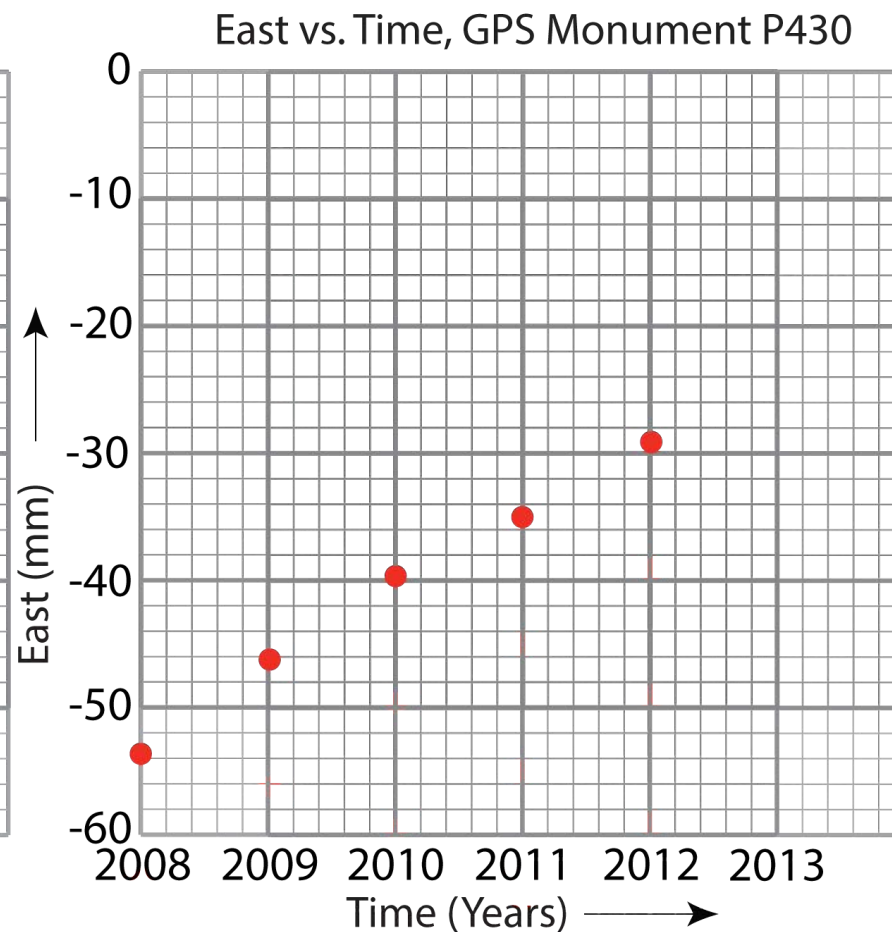
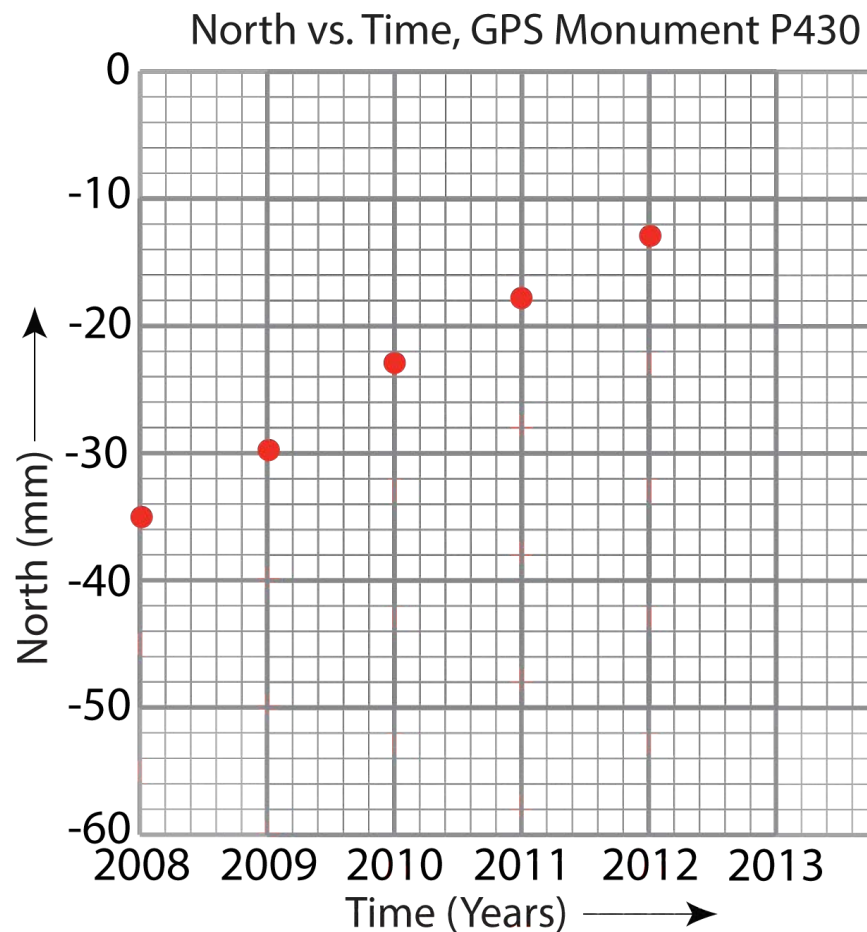
For example, when time is one of the things you graph, you plot it on the x-axis -- time marches along no matter what. Time is therefore the independent variable.

The y-axis is for the component that changes depending on time. This is called the dependent variable.

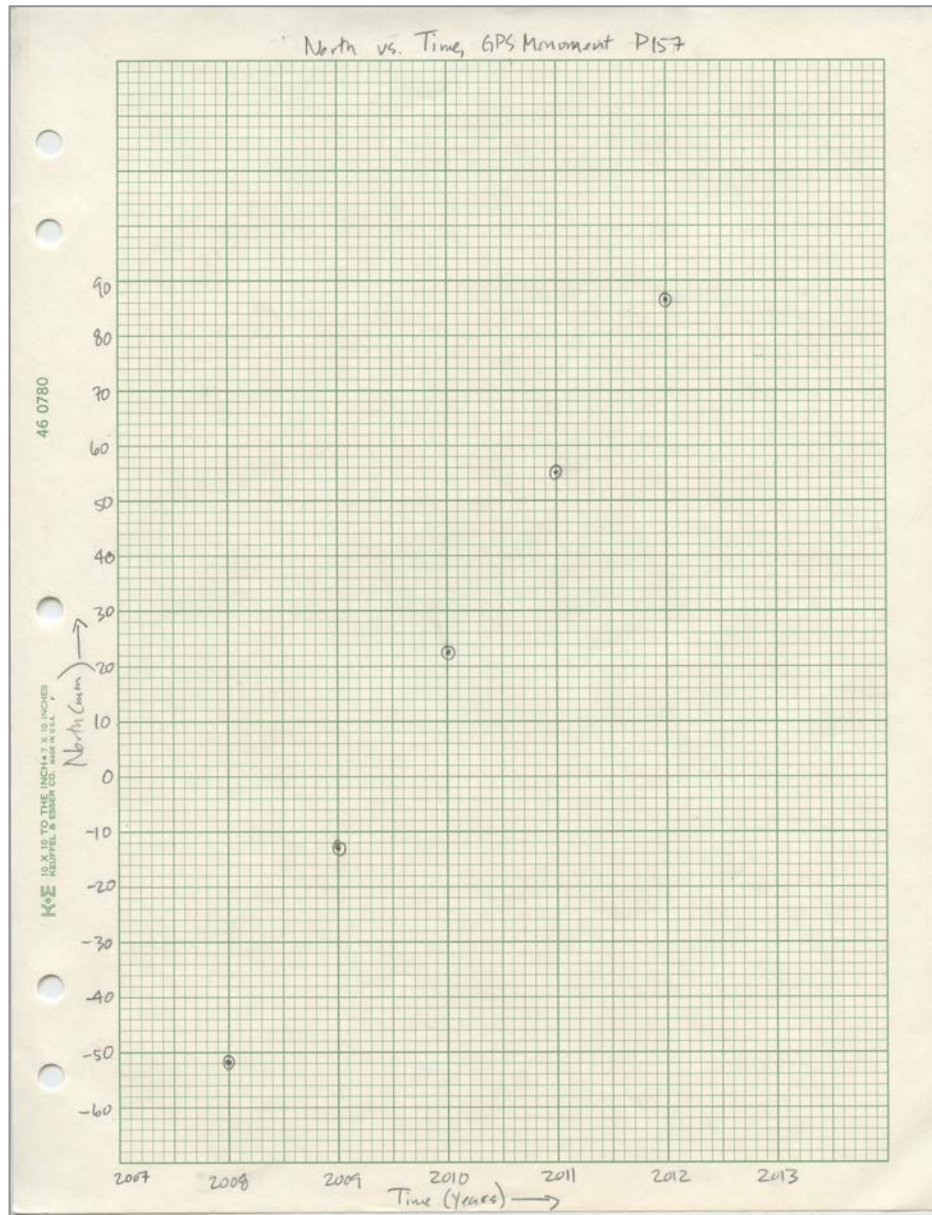




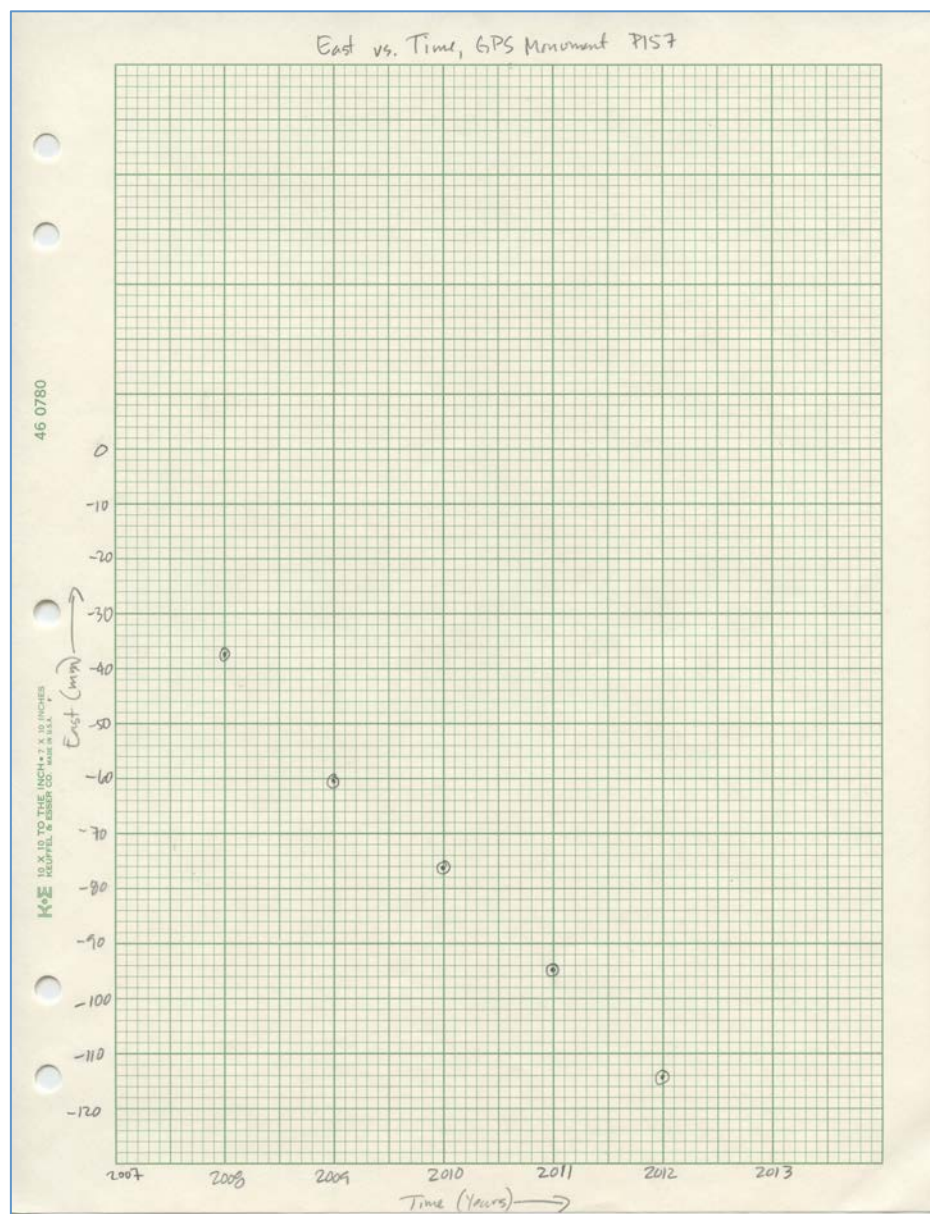
Year	North Position (mm)	East Position (mm)
2008	-35.5	-53.8
2009	-29.9	-46.3
2010	-22.9	-39.8
2011	-17.8	-35.0
2012	-12.8	-29.2
...		...



Year	North Position (mm)	East Position (mm)
2008	-52.0	-37.4
2009	-12.9	-60.5
2010	22.1	-76.1
2011	54.9	-95.1
2012	86.5	-114.5
...		...

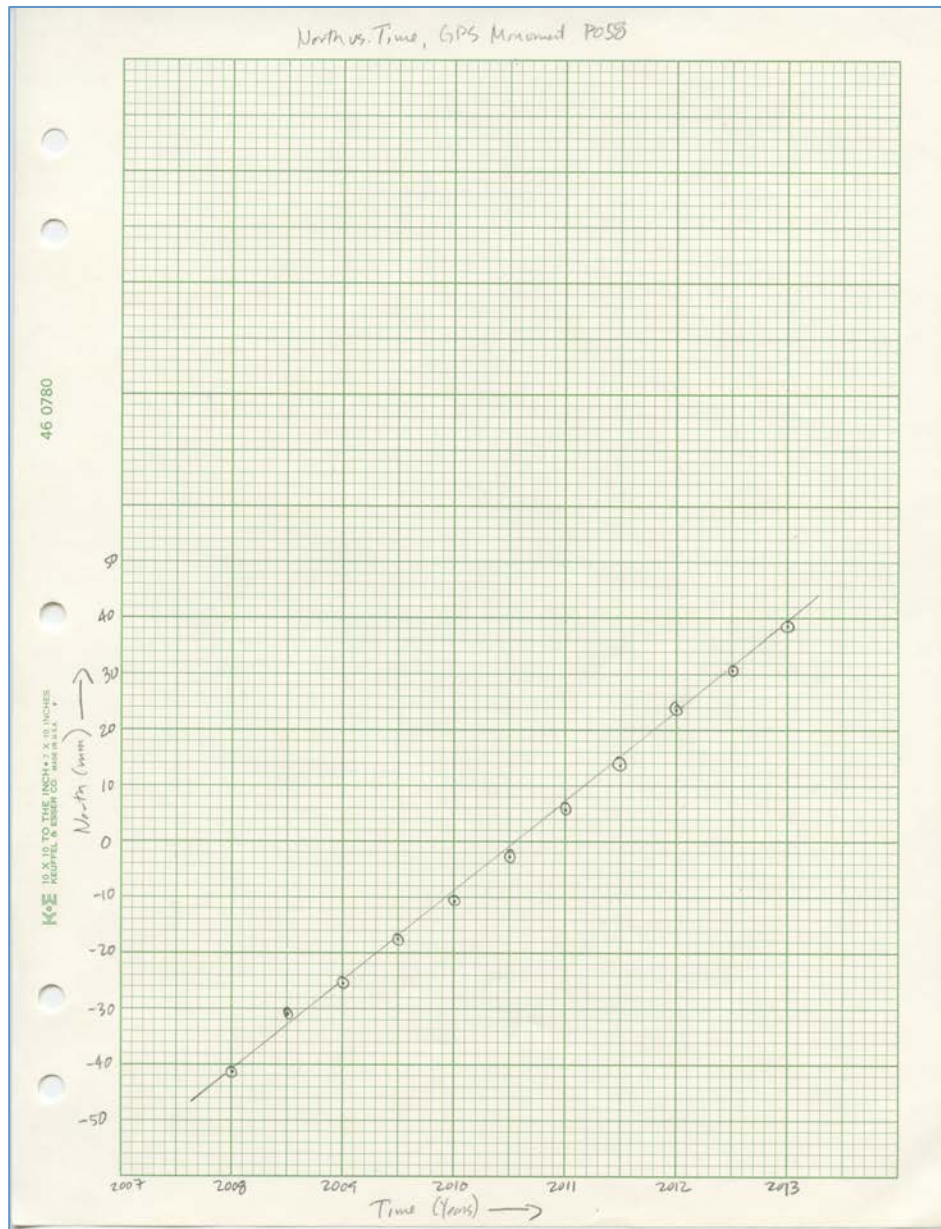


Year	North Position (mm)
2008	-52.0
2009	-12.9
2010	22.1
2011	54.9
2012	86.5
...	

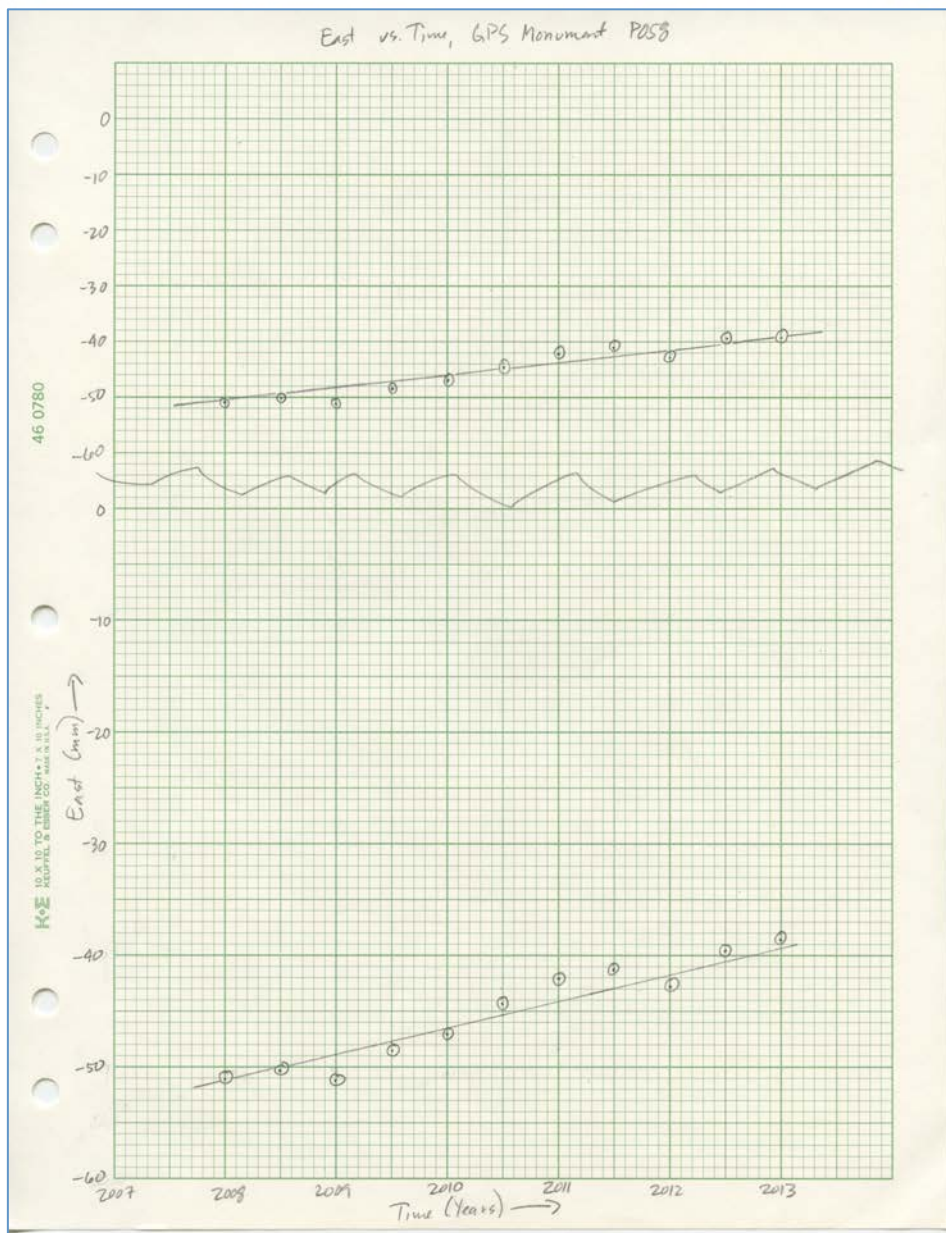


Year	East Position (mm)
2008	-37.4
2009	-60.5
2010	-76.1
2011	-95.1
2012	-114.5
...	...

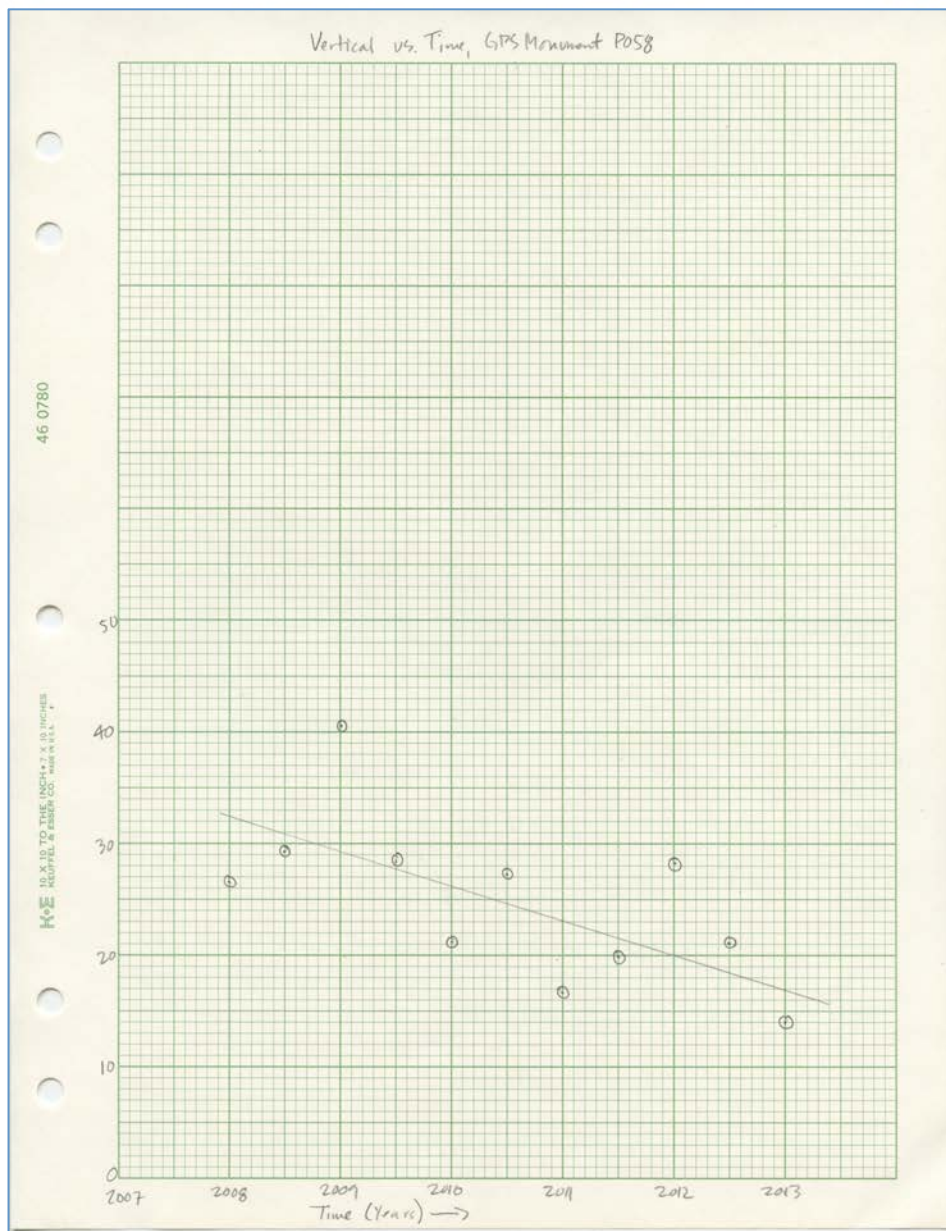
Year	North Position (mm)	East Position (mm)	Vertical (mm)
1/1/08	-40.9	-51.1	26.5
7/1/08	-31.0	-50.4	29.1
1/1/09	-25.8	-51.3	40.4
7/1/09	-17.4	-48.6	28.3
1/1/10	-10.7	-47.2	21.2
7/1/10	-3.0	-44.3	27.2
1/1/11	5.7	-42.1	16.5
7/1/11	13.8	-41.3	19.9
1/1/12	21.9	-43.0	28.1
7/1/12	30.4	-39.7	21.0
1/1/13	38.5	-38.7	10.4
...		...	



Year	North Position (mm)
1/1/08	-40.9
7/1/08	-31.0
1/1/09	-25.8
7/1/09	-17.4
1/1/10	-10.7
7/1/10	-3.0
1/1/11	5.7
7/1/11	13.8
1/1/12	21.9
7/1/12	30.4
1/1/13	38.5
...	



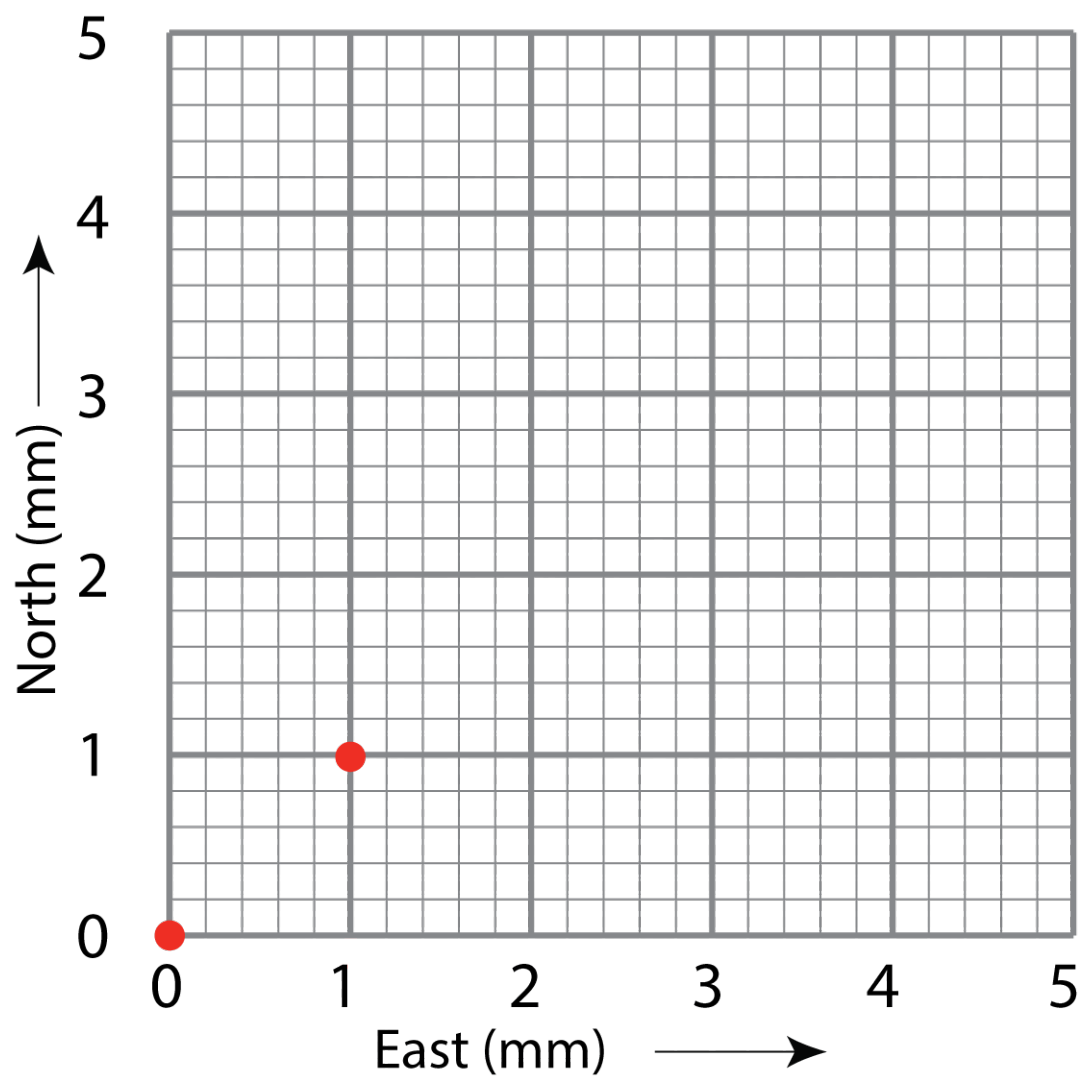
Year	East Position (mm)
1/1/08	-51.1
7/1/08	-50.4
1/1/09	-51.3
7/1/09	-48.6
1/1/10	-47.2
7/1/10	-44.3
1/1/11	-42.1
7/1/11	-41.3
1/1/12	-43.0
7/1/12	-39.7
1/1/13	-38.7
...	...



Year	Vertical (mm)
1/1/08	26.5
7/1/08	29.1
1/1/09	40.4
7/1/09	28.3
1/1/10	21.2
7/1/10	27.2
1/1/11	16.5
7/1/11	19.9
1/1/12	28.1
7/1/12	21.0
1/1/13	10.4

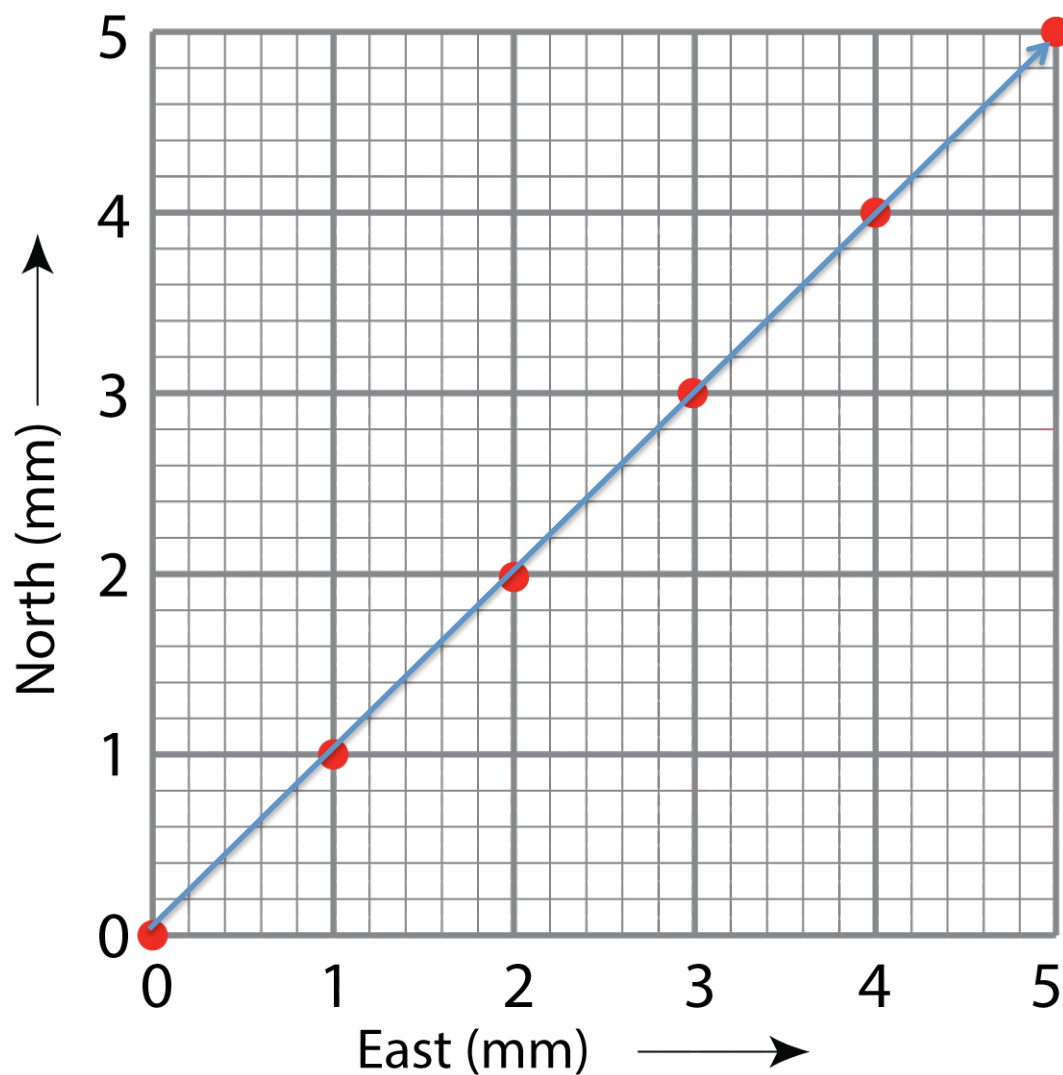
Year	North (mm)	East (mm)
2000	0	0
2001	1	1
2002	2	2
2003	3	3
2004	4	4
2005	5	5

North vs. East, GPS Monument A

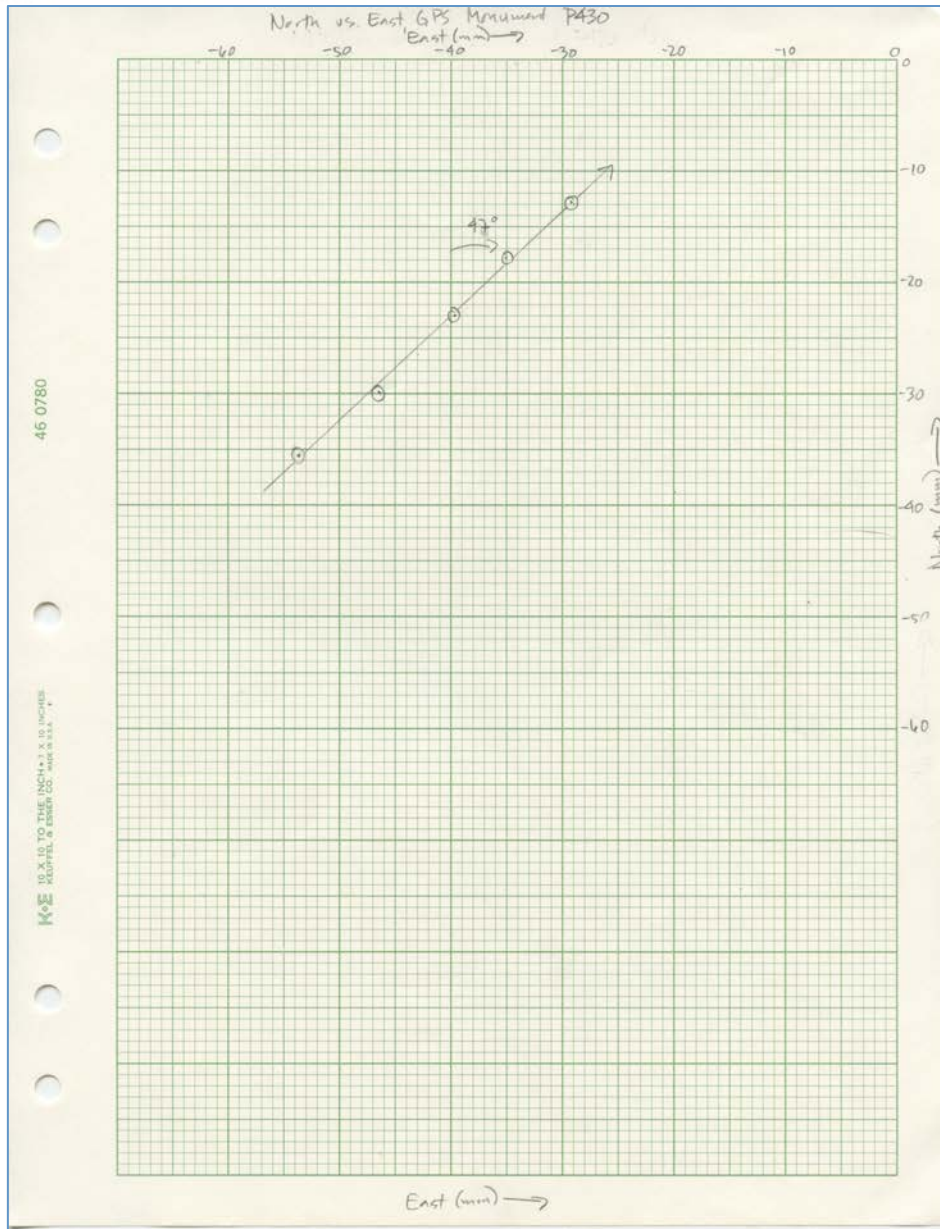


Year	North (mm)	East (mm)
2000	0	0
2001	1	1
2002	2	3
2003	3	3
2004	4	4
2005	5	5

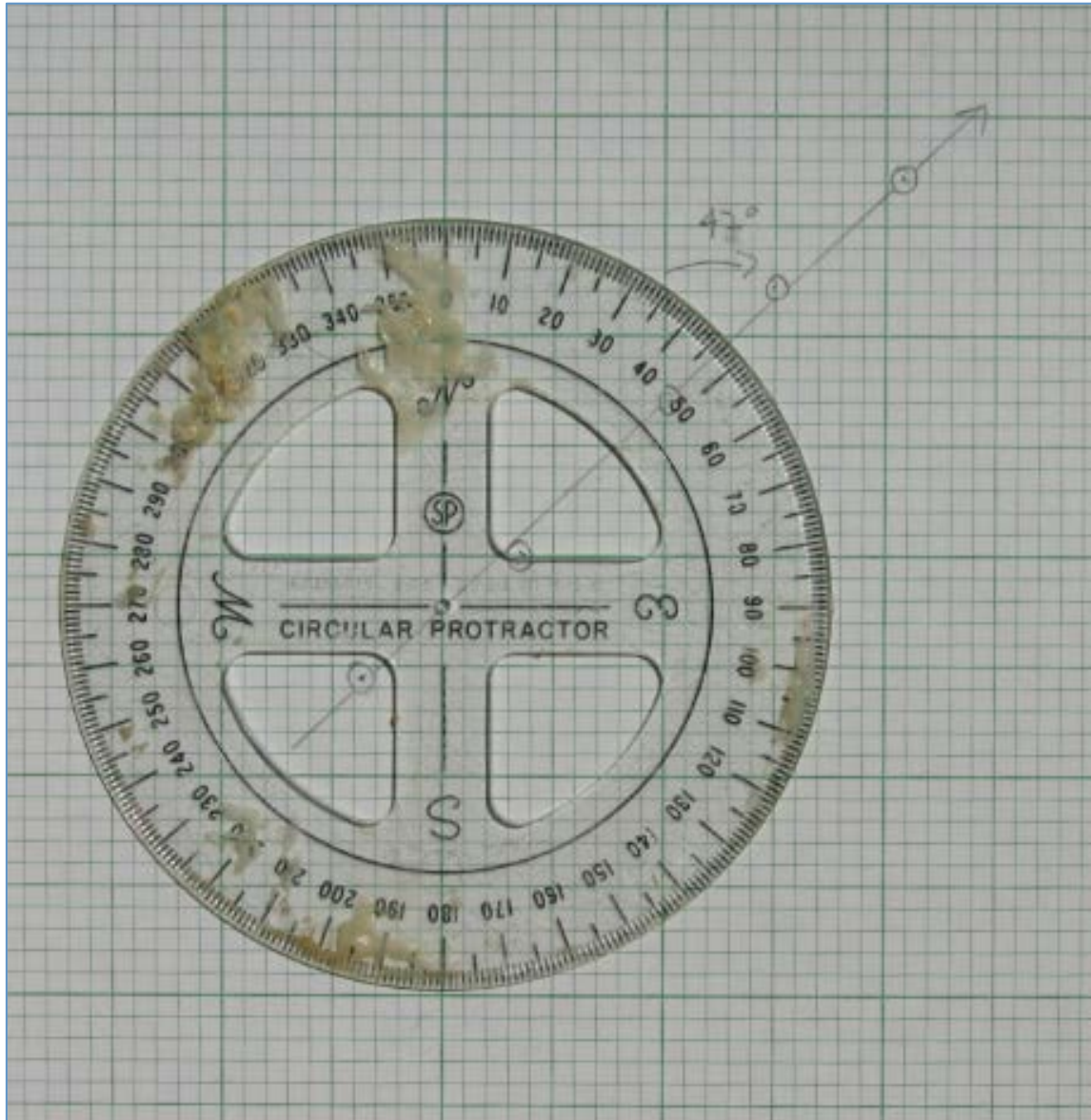
North vs. East, GPS Monument A



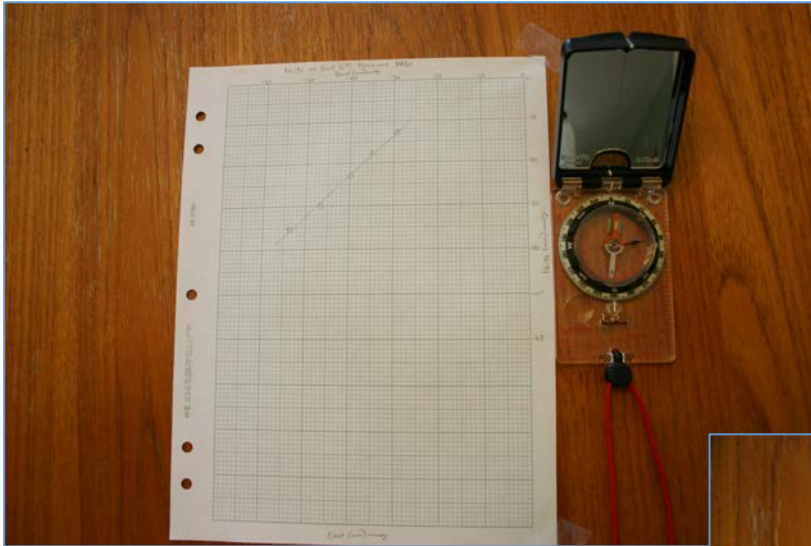
Year	North (mm)	East (mm)
2000	0	0
2001	1	1
2002	2	3
2003	3	3
2004	4	4
2005	5	5



Year	North (mm)	East (mm)
2008	-35.5	-53.8
2009	-29.9	-46.3
2010	-22.9	-39.8
2011	-17.8	-35.0
2012	-12.8	-29.2

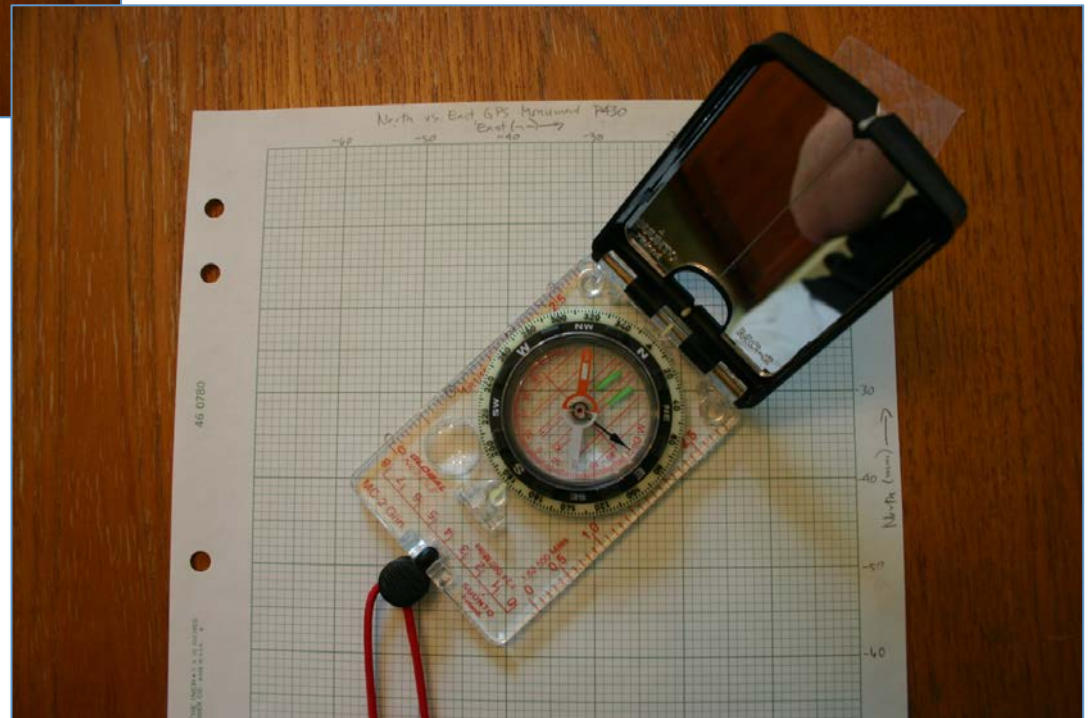


Measuring
the azimuth

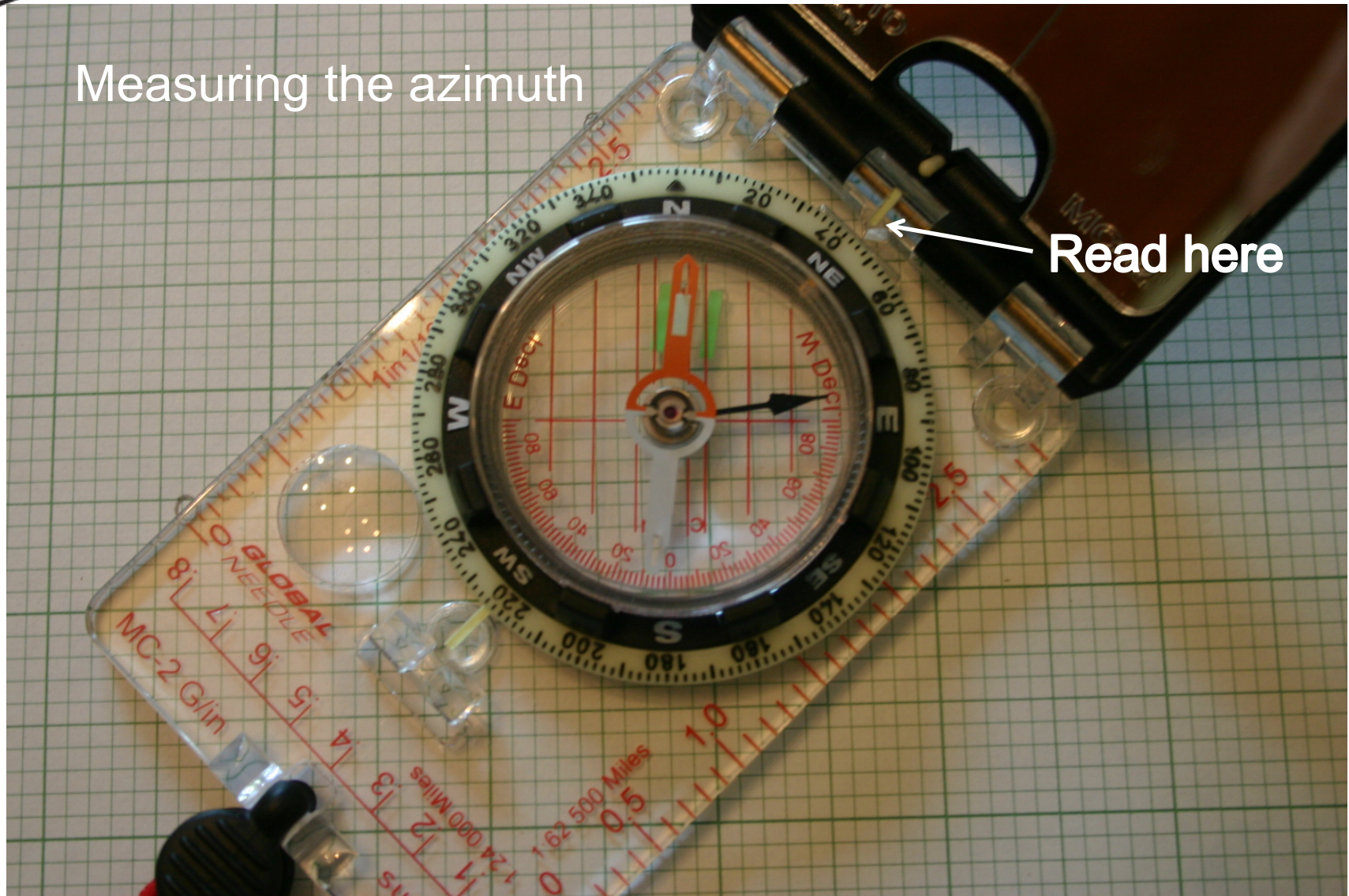


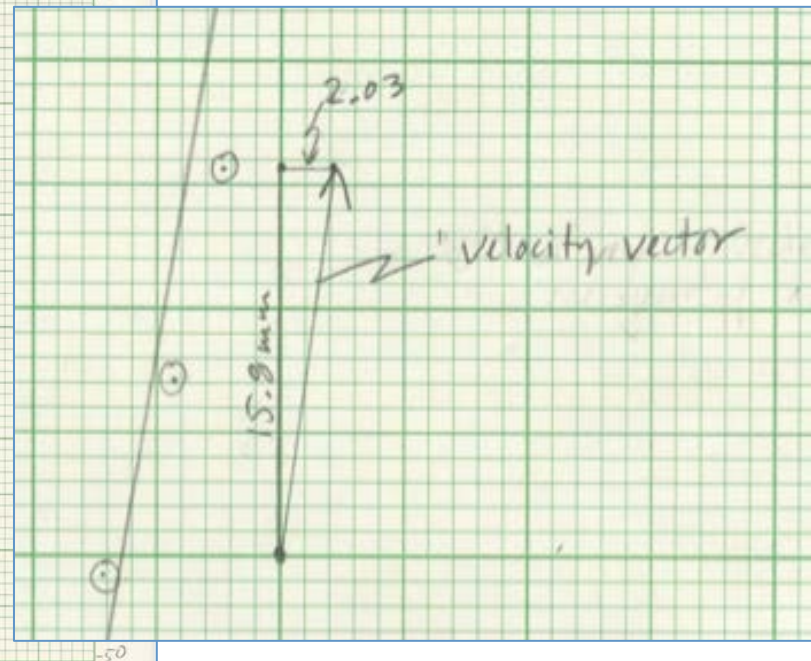
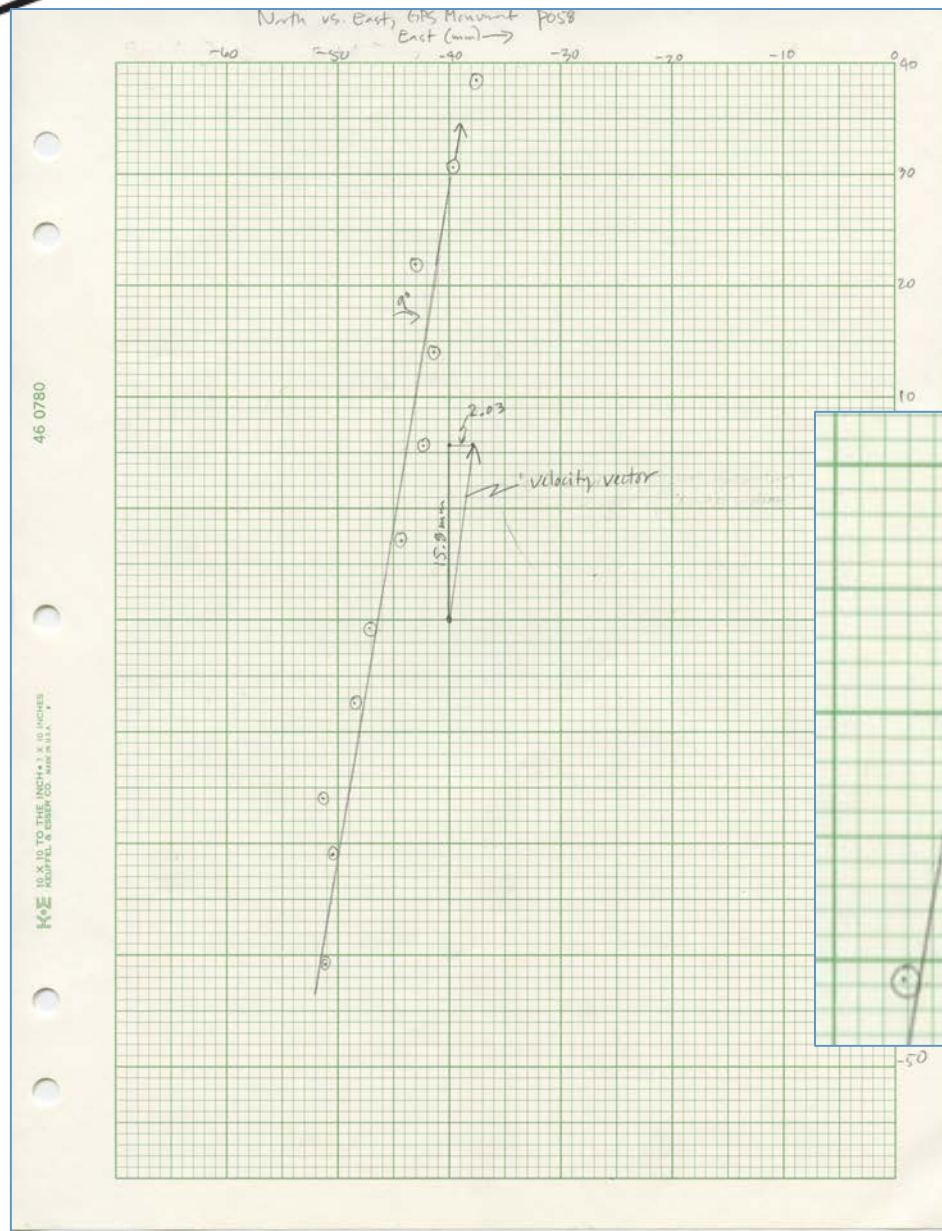
Lining the paper up
with north

Measuring the azimuth

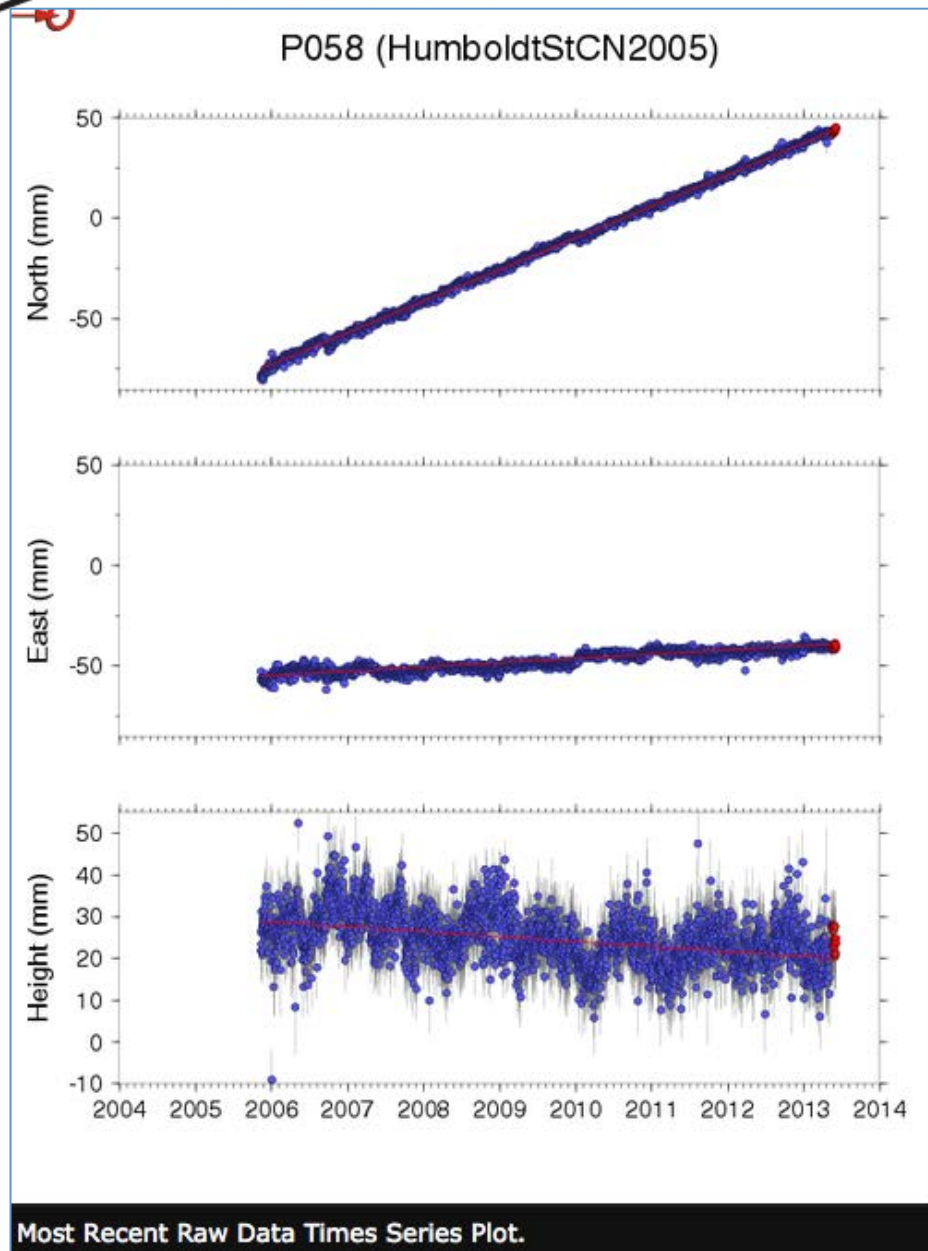


Measuring the azimuth





Expanded velocity vector



Time series data for P058



