

Navigation Northwest

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--Navigation Northwest October Features--

GAIA GPS -- Power User/Navigation Instructor Critique	John Godino
iOS Declination Apps—Staying Within 1 Degree	Bruce Crawford
Mountaineers Books eLearning National Experiment Wrap Up	Doug Canfield

Courses, Classes, Apps, Gear & Links

Wilderness Navigation Course 2017 Classes	
Smart Phone and Dedicated GPS 2017 Classes	
Introduction to Map, Compass & Altimeter 2017 Classes	
Other Branch and Club Navigation News and Classes	
Find Free Altimeter & GPS Apps: Android and iOS Devices	Lynn Graf, Brian Starlin & Emma Agosta
Navigation Gear, Apps & Links of Interest	Pat Podenski
Seattle & Foothills Compass Recommendations for 2017	Bob Boyd
Seattle Program Center Compass Calibration Station	Bob Boyd

Editor Notes

We continue our search for outings where navigation and/or communications issues provide "Lessons Learned."

My eye caught two lines reading the US Navy report on the tragic 17 June collision of a freighter with the USS Fitzgerald off the coast of Japan:

>>0526 Seven Sailors remain unaccounted for.

>>0800 FTZ switches to paper charts due to loss of navigation systems.

Yes, I carry hard copy maps plus Gaia and All Trails on my iPhone.

Freedom 9 is now available for sale (paper, hard copy and e-version) .

GAIA GPS –Power User/Navigation Instructor Critique

By John Godino

Gaia GPS, one of the leading backcountry navigation apps for the iPhone and Android devices, had a major upgrade in spring 2017. As a long-time user and beta tester, I've had the chance to give it a go for the last few months. Here's my short take on the pros and cons.

Pros

Generally more intuitive and improved user interface

Commonly used features are right on top. You can toggle on or off certain parts of the app. Less clicking through to find things.

>Faster loading of maps

The download speed, file size and loading times for many maps have improved.

>New and improved map layers

The layer Gaia Topo (feet), and the open source "Open Topo" layer are especially nice. Using open source maps usually ensures your trails are current, as the base map is constantly being updated by thousands of contributors around the world, much like Wikipedia. See Figure 1, Mt St Helens track.

>Premium level goodies

Trails Illustrated topo maps (yep, the same ones that cost about \$12 each at REI), ability to layer several different maps on top of one another with different levels of opacity (like Forest Service and elevation relief shading, for example) are pretty helpful. Personally, I think most users will do just fine with a base subscription and generally do not need the premium.

>Geo referenced PDF map import (soon)

Coming soon, says the Gaia development team, will be a feature to import geo-referenced PDF maps, similar to what the [Avenza](#) app can do now. This will be a major benefit for some users (foresters, biologists, geologists, etc.) who might use a custom map source not provided by Gaia.

>Great customer support

Not many small app companies get back to you within a day or so on just about any question you can imagine, but generally Gaia GPS does just this.

Cons

>Wonky design of [GaiaGPS.com](#) website

Some users have reported difficulties synchronizing previously stored data from the website with the new app. The design is a little goofy, with the homepage showing somewhat random routes in tracks uploaded by various Gaia GPS users without indicating the location--not very helpful. Yes, I've suggested several times that they should change this...)

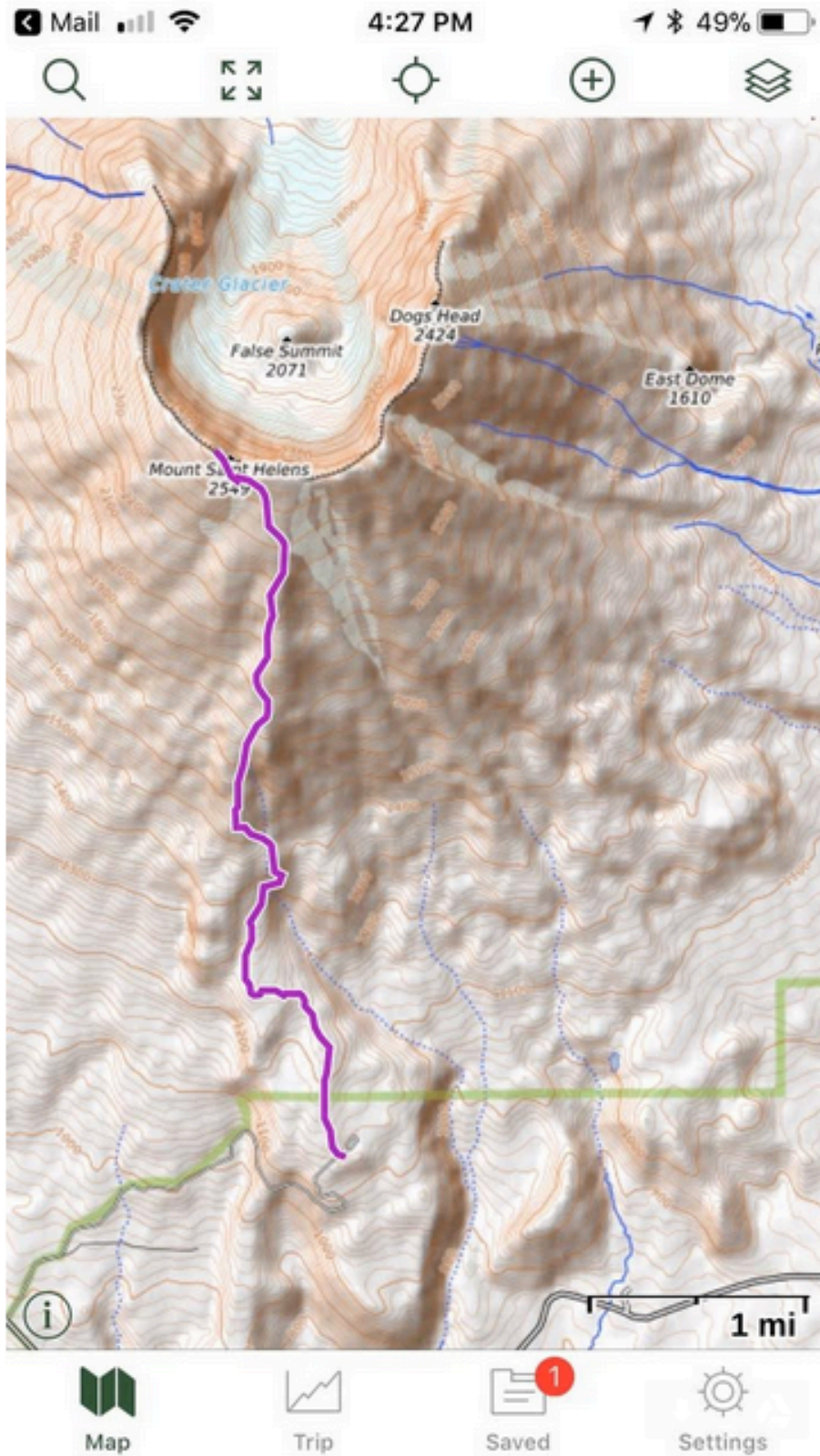


Figure 1. Monitor Ridge, Mt St Helens, GPX track import. Elevation in meters, distance in miles. Hmmm...

>More expensive

Before, you got lifetime use of the app for a one-time \$20 fee. Now, the app is \$10 per year, \$30 for 5 years, or \$30 per year with premium. This cost increase may discourage some casual users, but if you hike or climb on any regular basis, this is still a bargain.

>Android users, sorry

The Android version of the app is not yet up to speed with the improved iPhone version, and generally seems buggier. Word from the development team is that Android will be close to iPhone functionality in the next few months.

>Not always perfect synchronization of data between the GaiaGPS cloud to your phone.

Other tips...

So overall, Gaia GPS is not going to meet the needs of everyone, but it is still a solid tool for most. If you're going to carry a phone in the backcountry, I can't think of a reason why you would not want to have this app along with you.

I made a YouTube video that covers the key features of the new app. Search YouTube for "Gaia GPS 2017" to find it.

And, of course you need to carry the 11th essential, a small auxiliary battery and a tiny charging cable. Together these weigh about 3 ounces and cost about \$20, but you still need to remember to bring it! I have several, because they are easy to misplace.

And, for GPS power users, such as those who really need to record tracks all day long, and possibly in cold or wet weather, it's probably best to use a dedicated Garmin type GPS receiver. However, for most everybody else, a smart phone with a back up battery and a stout, waterproof case should do just fine.

--John Godino is a former U.S. Forest Service Wilderness Ranger and current Mazamas navigation lead instructor in Portland, OR. He is a regular Navigation Northwest contributor. Contact: johngo.pdx@gmail.com.

iOS Declination Apps

By Bruce Crawford

I opened a declination app I'd downloaded, and got a number that was obviously wrong (a degree off). A more thorough check showed it was consistently wrong, so I deleted the app and started the search for a new app. Avoid "Magnetic Declination" by Kekoa Vincent.

The two apps to try are "Declination" (free) by Amphibious Technologies and "Magnetic" a.k.a. World Magnetic Model (\$1) by B. Walker Software. Notes for both apps say they are current to around 2019 or 2020. Comparing these two apps to NOAA, I found:

Accuracy Declination appears to be within 0.1 degrees, and Magnetic is within 0.02 degrees of the NOAA declination for several locations around Washington.

Ease of Use When not in the network, the map you use to confirm your location is limited. But both apps will use your GPS location to give you a declination, no matter whether the mapping is there.

Declination has a photo-based map, which, even with low resolution when not connected, allows you to approximate the area of your trip pretty well. But if you haven't looked at the area before losing connectivity, there is no map (bummer).

Magnetic has a map showing some cities and roads worldwide, even if not connected. Not great for pinpointing your area, but better than nothing. If you've viewed an area before disconnecting from the network, the map is more detailed, but still like a street map. Forests are green, that's it. Big lakes and rivers are shown. Note that to see the declination, you must touch Detail in the upper right corner where you also find other info.

Conclusion Both apps work reasonably well, with limitations. Both benefit from looking at areas when connected to the network (they cache detailed maps). But, if you haven't looked at an area when connected, Magnetic will at least show you a map. I think they're both keepers.

--Bruce Crawford is a veteran member of the Seattle Navigation Committee. A keen scrambler and musher, he models METRO wastewater flow by day. Contact: brucec@bikejor.com

Mountaineers Books' Summer "Navigating Through the Wild" Experiment Wrap-up

By Doug Canfield

This summer Mountaineers Books offered to the world a modified version of the online Wilderness Navigation workshop—and actually registered some international students!

The online Wilderness Navigation course was stripped of its field trip module and references and organized as the workshop only. The standalone version was renamed "Navigating Through the Wild" to avoid any confusion with the standard Mountaineers course. The workshop text (*Wilderness Navigation, 3rd Ed.*) was used for the standalone, as was the Baring-quad USGS map and Romer tool. Registration cost \$49 for non-members. Very little marketing was done for this experiment. Mountaineers Books advertised it on mountaineersbooks.org, and included it in its book-marketing emails, which go to a widely dispersed audience of about 14,000. There was also a very small amount of Facebook advertising.

Registration was open for two months, enrolling 21 students over that period. Students were given 4 weeks to complete the course. The completion rate for this workshop-only group was 62% (13 of 21), compared to more than 80% for the online Wilderness Navigation course offered by the Seattle/Foothills and Kitsap branches. That lower completion rate is not surprising given that the branch version requires students to complete the online workshop in order to be accepted for the field trip and earn the navigation badge.



Most of the management for the standalone course involved setting up students in the LMS (learning management system) software and emailing them access instructions. Other than a couple of check-in emails, there was almost no interaction with the students, even though they were invited to ask questions or reach out for help. Of the handful of student questions received, all were technical in nature or asked for an extension of their access, which was given. In those interactions, the instructor took the opportunity to ask for feedback, and in each case the response was positive—"I enjoyed the course and think I learned a good amount", is one example.

Of the 21 students enrolled in this standalone workshop, their locations were as follows: 7 in Washington, 4 in California, 1 in Oregon, 1 in Alaska, 1 in Colorado, 1 in Kansas, 1 in Minnesota, 1 in North Carolina, 1 in Tennessee, 1 in Connecticut, and 2 in Australia.

The standalone course isn't currently scheduled to run again.

--Doug Canfield is marketing director for Mountaineers Books and an experienced Wilderness Navigation instructor. He was lead developer and trouble-shooter for the initial online course. Contact: dougc@mountaineersbooks.org.

Wilderness Navigation Course Offerings--Seattle

Basic Navigation transitioned to Wilderness Navigation in 2016, clearly focused on wilderness/back country travel including off trail navigation to meet requirements for Alpine Scramble, Basic Climbing, Snowshoe and BC Ski students (and others). Altimeters and GPS units (basic point position) are included. See [Seattle2018](#)

Date & Day	Workshops*	Date & Day	Fieldtrips
Tuesday, Sep 26 to Tuesday, Oct 24	Online Classroom	Sat, Nov 4	Heybrook Ridge
Wednesday, Oct 25	Program Center	Sat, Nov 4	Heybrook Ridge

**Note: Students may enroll in the elearning program, as available, to complete the workshop online prior to their fieldtrip.*

Smart Phone and Dedicated GPS Navigation Course—Seattle*

Are you interested in learning to use your smart phone as a wilderness GPS? Maybe you have had a dedicated GPS for years and want to get the most out of it? The Smart Phone and Dedicated GPS Navigation course is for you! We will cover basic usage of both dedicated GPS units and the Gaia GPS app for smart phones, as well as common issues that can affect GPS accuracy and ways to avoid them. This course is an evening at the Mountaineers Seattle Program Center, split between a classroom lecture and a hands on outdoor exercise. Prior completion of the Wilderness Navigation course is strongly encouraged. Fee and Badge.

Topics include:

- Overview of how GPS works
- Common accuracy issues and solutions
- Review of UTM coordinates – Working knowledge is assumed
- Entering waypoints
- Navigating to a way point
- Back tracking a route
- Overview of emergency communication devices (SPOT & PLB)

Students need to bring a GPS enabled device to the class; loaners are not available. We cover both Gaia for iOS and Android devices (\$20, pro not required/Free to Mountaineers) and Garmin dedicated units. Other brand GPS units are welcome, but instructors may not be familiar with them. Lead course administrator is Michael Hutchens.

The current URL provides a description and the 2018 dates are on the calendar: [GPS2018Seattle](#)

Smart Phone & Dedicated GPS Course	Location
Wednesday, January 31	Seattle Program Center
Wednesday, April 18	Seattle Program Center
Wednesday, May 23	Seattle Program Center
Wednesday, June 6	Seattle Program Center

Wednesday, August 22	Seattle Program Center
Wednesday, September 26	Seattle Program Center

Introduction to Map & Compass (& Altimeter) – Seattle*

The Seattle Navigation Committee scheduled six 2018 Introduction to Map and Compass dates at the Seattle Program Center from 6:30 to 8:30 p.m. Instructors are drawn from the pool of Wilderness Navigation Course teachers. Enroll when 2018 workshops are posted.

Administrative leads are Nina Crampton & SuJ'n Chon. This Getting Started introductory class does not satisfy the navigation requirement for Alpine Scramble, Basic Climbing, Snowshoe or Backcountry Ski. Fee, no badge.

Intro to Map, Compass (& Altimeter)	Location
Monday, January 15	Seattle Program Center
Wednesday, April 25	Seattle Program Center
Monday, May 14	Seattle Program Center
Monday, June 11	Seattle Program Center
Monday, August 13	Seattle Program Center
Monday, September 10	Seattle Program Center

Other Seattle 2017, 2018 Navigation Seminars/Clinics*

Seminars/Clinics	Dates
Instructor Training in Person – No fee	Wed, Jan 17
Instructor Training Elearning – No fee	Wed, Oct 10
Mentor Session Wilderness Navigation – No fee	Thur, Nov 2
Wilderness Navigation Equivalency – No fee	Rolling enrollment
Contact Leader Lynn Graf	

Other Branches 2018 Navigation Courses*

Branch	Course	Dates
Everett	Basic Navigation	2018 TBD
	Wilderness Navigation eLearning Option	Under Consideration
Foothills	Staying Found	Spring Dates TBD
	Wilderness Navigation	Under Development
	Back Country Winter Navigation	Under Development
Kitsap	Both series have Elearning Wkshp Option	Feb 01 thru Feb 28
	Wilderness Navigation Lecture (Optional)	Thur, Mar 1
	Wilderness Navigation Wkshp/Field Trip	Sat, Mar 3
Olympia	Navigation Lectures 1 and 2	Apr 17 and 19
	Navigation Field Trips	Apr 21 and 22
Tacoma	Wilderness Navigation Lectures 1 & 2; Field Trip	2018 TBD

* Be sure to check mounaineers.org for up-to-date listings.

Navigating Through the Wild Elearning Course – No Badge

Books -- National	Online Lessons Support Backcountry Off Trail Travel -- Contact Doug Canfield, Books	Completed, No plans to repeat
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Mazamas (Portland, OR) 2017 Navigation Instruction*

Portland	Navigation Skill Builder Class – Videos, Wkshp, Field work	TBD 2018
	Smartphone GPS	TBD 2018

*Northwest climbing clubs support similar goals for exploration, learning and conservation. Reciprocity is routinely granted across state lines. Mazamas lead navigation instructor is John Godino, contact johngo.pdx@gmail.com.

Navigation Gear, Apps & Links of Interest

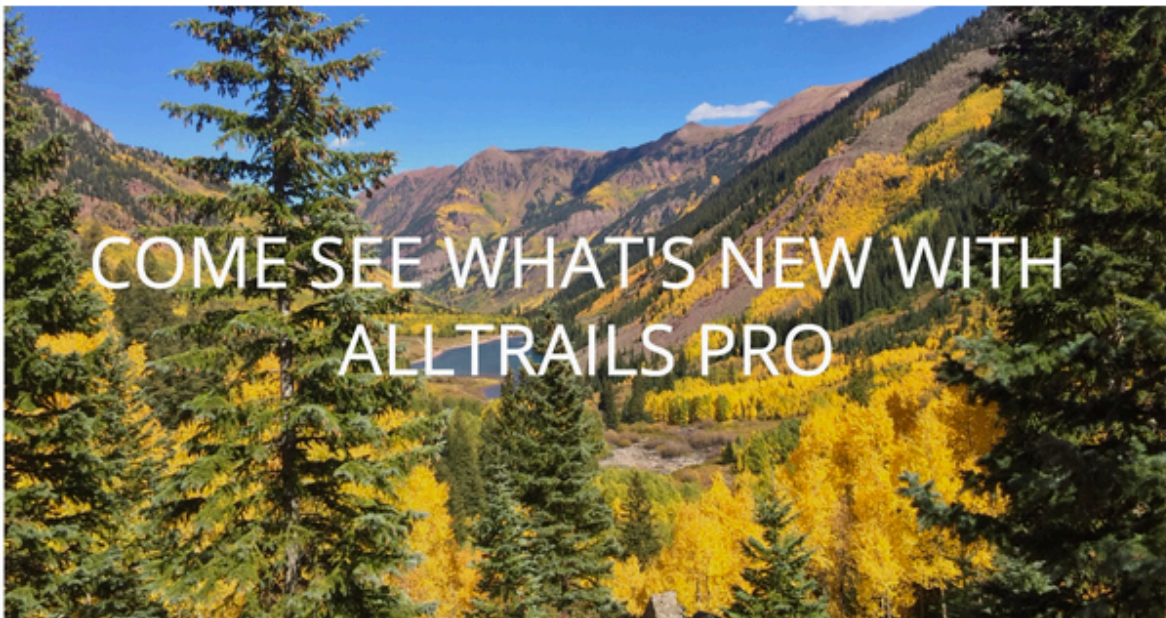
Your comments and suggestions are ever welcome regarding the Seattle Navigation website and links in Navigation Northwest. –Pat Podenski, Section Ed

The Gear...

- Navigating city streets on night hikes? Try the Nebo “Big Larry” COB LED light. Editor and wife use Big Larrys to lead and sweep hikers across city streets alternating between red flash (crossings) and white (sidewalks and park trails). A great partner to the headlamps all wear. [Around\\$17](#)

The Apps...

- AllTrails Pro tools upgrade announced with emphasis on custom maps, Quickdraw to create custom maps, real-time overlays, and more print options. Site: <https://www.alltrails.com/>



We're excited to announce our new and improved Pro tools to help you spend more time outside doing what you love!

CHECK OUT WHAT'S NEW

Google maps will work like Google Earth by using the mouse control key to change from 2-D to 3_D view. Try it on a tall mountain – a John Godino. See: [Full3d](#)

(Following apps first published in June 2017 issue)

Free (or nearly) Altimeter Apps For Smart Phones

By Lynn Graf

	App Name	Device	Developer	Cost
	Gareth Altimeter	Android	Gareth Price	free
	Accurate Altimeter	Android	AR Labs	free
	Pro Altimeter	iPhone	Hunter Research and Technology	\$0.99
	Altimeter Plus	iPhone	Sichtwerk AG	free

Short guide to a few recommended altimeter apps for cell phones

Don't want to spend the money for a classic wristwatch altimeter, one more gadget? Basically all SmartPhones nowadays have GPS capability. This means that they can pinpoint your spatial position without cell service, which is often spotty or non-existent in the backcountry (and searching for a signal drains the battery, in case you haven't noticed). Many of the newer models (iPhone 6 and later, for example) also have a pressure sensor. This can be used for extra correction or a cross-check of elevation by barometric pressure (which is what wristwatch altimeters use) but that is not really necessary and requires more frequent calibration.

Here are recommendations for two very basic apps for Android and two for iPhones.

Selection Criteria (not in order of importance): low or no cost, easy to use, no cell service required, no ads, low memory and storage usage, reasonable speed at obtaining GPS signals, clear numerical display, recommendation from Mountaineers member(s) who have used it in the field.

There are many more out there, more all the time, and increasingly with features in addition to GPS-based elevation. We invite you to try them, see how they work for you, and let us know if they don't work as advertised. If you want additional information, see the article in Navigation Northwest



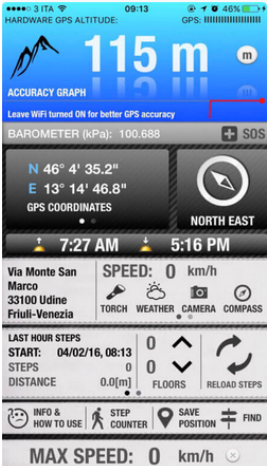
(<https://www.mountaineers.org/blog/how-to-pick-an-altimeter>) describing a systematic comparison of several Android apps.

Also, The Mountaineers currently has a deal for free use of GAIA Pro that basically turns your cell phone into an advanced GPS device. Check the website under "Benefits" (<https://www.mountaineers.org/membership/benefits/instructions-for-redeeming-member-benefits>). It is highly recommended but requires time and practice to set up and use efficiently. The Seattle Navigation GPS class features Gaia as the app of choice. Backcountry Navigator, another full-service GPS app, also has many followers. Both are well worth it, in my opinion, but a paper map, compass and altimeter app will get you a long ways, both on and off-trail.

--Lynn Graf is a past Seattle Navigation chair and an active hikes and scrambles trip leader. She is a frequent contributor to Navigation Northwest. Contact her at: lynn.graf@gmail.com.

Free (or nearly) GPS Apps for Smart Phones

By Brian Starlin and Emma Agosta

Screen Shot	App Name	Device	Developer	Cost
	MyTrails	Android	FrogSparks	Free Pro €2
	GPS Essentials	Android	Schollmeyer Software Engineering	Free
	Handy GPS	iPhone	Anthony Dunk <i>[Note: Also authored Coordinate Master to convert Lat/Long to UTM]</i>	Free
	Altimeter GPS	iPhone	Andrea Piani	Free

Criteria for Android and iOS GPS:

- 1) Backcountry oriented (Topo Maps rather than street maps)
- 2) Works offline, in airplane mode, with only the GPS on

- 3) Can display UTM and Lat/Long
- 4) Has at least NAD83/WGS84, but gets extra points if it has NAD27
- 5) Extra points if it's available for Android and iOS
- 6) Able to save data and send in GPX format
- 7) Able to import GPX format
- 8) Accurate (although I believe it's based on underlying GPS hardware)
- 9) Extra credit if tracks can be shared on a cloud service
- 10) Free

We used a 10-point scale with higher numbers meaning more of the above features were found. Also, there is a main point we need to make. Gaia is a serious app for backcountry use and has all the features we want. And Gaia Pro is currently free to Mountaineers members.

Android Reviews (Brian)

>>GPS ESSENTIALS (mictale.com) -- 5 points

Only available on Android.

It only uses cached maps, which limits its offline usefulness.

Very robust dashboard, highly configurable.

Limited selection of map sources

The UI is clunky. It uses a thing called "streams" to store data. The Import/Export functions were hidden in the "streams." The track recording was also buried in the stream screens. The Dashboard is great, but the other functions are clunky.

>>HANDY GPS (BinaryEarth) -- 2 points

Great for just displaying your coordinates in various formats. It has very limited maps -- a blank screen, and the Google Maps. The map does not work offline and cannot be downloaded.

>>MYTRAILS (FrogSparks) -- 6 points.

Great selection of maps. I think it has only NAD83/WGS84 because I don't see a Datum setting. Tracks and waypoints can be saved as GPX. The free version can only save the current track, plus one. And can only store 100 tiles at a time in the offline storage. UTM displays on the screen. It's on Android.

>>RAMBLR (Bientus) -- 2 points

This is more of a journaling and trip sharing app than a GPS app. It's very focused on tracking and sharing details of a trip. It has Google Terrain and OpenCycle maps. It can use an offline map. It does not display coordinates, but it can show you your location on the map background. As I said, it's a journaling app.

iOS Reviews (Emma)

Additional features I noticed are under "other features and comments."

>>ALL TRAILS -- 3 points, free

Hiking oriented but by trail (not backcountry). More like WTA app. Works offline. WGS 83/84. Available for IOS and Android. Map overlays (such as USGS topo) are in the Pro version (\$29.99/year). No UTM or Lat/Long. Other features/Comments: ability to track a route, keep history etc. Many other apps do this for hiking, biking, running and other sports. I do not believe these are the kind of apps our readers are looking for.

>>ALTIMETER GPS -- 4 points, free.

Not backcountry oriented. Lat and Long: yes. No UTM. Elevation (ft/meters). Accuracy: unknown. Available on both? Some features only work with internet (i.e. choice of map format). Other features/comments: Weather, barometric pressure. Compass heading, Step Counter. Speedometer. Save position. Ads (non intrusive at the bottom, yet one can accidentally click). Find feature to search for location.

>>DECLINATION -- 1 point, free

Not backcountry oriented (map: satellite view). Lat and Long and UTM. Works offline: yes. Accuracy: unknown; Datum: ? Other features/Comments: Declination; Ability to search by Lat and Long. Ads.

>>HANDY GPS -- 6 points, free

Not backcountry oriented. Works offline: yes. UTM and Lat/Long, (plus elevation); Datum: ? Available for both IOS and Android. Able to save data and email : yes. GPX file: no; Accuracy level (+-10m). Other features/comments: nice display: uncluttered; intuitive, user-friendly; key features: Map. Digital Compass. Can save waypoints and email position from within the app. No ads. My favorite among free but cannot compete with Gaia.

>>MAP TOOLS -- 3 points, \$0.99

Street oriented; Works offline; Lat and Long and UTM; Datum: ?; GPX format: no; accuracy: unknown. Other features/comments: Not intuitive. Confusing zoom in and out feature. Declination provided.

--Brian Starlin is the Seattle Navigation Chair and a frequent Navigation Northwest contributor. Contact him at brian.starlin@comcast.net

--Emma Agosta is a Seattle Navigation instructor and committee member. A geologist, she is fluent in land forms (and Italian). Contact her at emagosta@gmail.com

And the links ...

- A summary of 10 beginner mistakes with GPS - be prepared before you need it. <https://sectionhiker.com/10-beginner-gps-mistakes/>
- An article that describes how you can get free maps for your Garmin GPS device. <https://hikingguy.com/hiking-gear/how-to-get-free-garmin-gps-maps-for-hiking/>

- The peril of depending on technology is losing basic skills. The automation paradox is discussed in this article.

"Automation leads to degradation of operator skills, while, at the same time, the skills required to handle automation failures are frequently considerably higher than average."

<https://aye.tf/2017/09/04/gps-accuracy-and-the-automation-paradox/>

- Andrew Skurka discusses one of the simplest navigational skills, dead reckoning. Dead-reckoning is much easier to learn than reading a map, or operating a compass, GPS, or altimeter watch.

<https://andrewskurka.com/2017/tutorial-dead-reckoning-navigation-hiking/>

- Another article relating the challenges of over reliance on technology.

"According to a 2015 Pew Research Center survey, nine of 10 smartphone owners use their device to get directions or for other location-based services, up from 74 percent in 2013. That heavy reliance on devices can give people a false sense of security."

https://www.washingtonpost.com/national/health-science/why-its-a-real-mistake-to-count-on-a-cellphone-when-you-go-hiking/2017/09/15/7bc1a822-6595-11e7-8eb5-cbccc2e7bfbf_story.html?utm_term=.7b46712176df

- A PCT hiker describes the challenges of finishing the hike in Washington under challenging conditions.

"Moving forward, I recommend all long distance hikers carry paper maps like USGS quads to reveal more information about the surrounding areas than is provided on the PCT apps. Because this extra information alone could save a life when it counts."

<https://www.pcta.org/2017/pct-last-one-canada-loses-45357/>

Finally, a couple of features in the premium version of Gaia GPS:

U.S. Forest Service Motor Vehicle Use Maps Now Available

<https://blog.gaiagps.com/u-s-forest-service-motor-vehicle-use-maps-now-available/>

NeoTreks Land Use Maps Now Available

<https://blog.gaiagps.com/neotreks-land-use-maps-now-available/>

Navigation Gear--Compasses

Required Compass Features: Seattle Wilderness (Basic) Navigation Course & Foothills Staying Found Seattle Mountaineers—Revised March 2017

1. **Adjustable declination:** If there is one feature that simplifies map and compass work, this is it. Compasses with adjustable declination can often be identified by the presence of an adjustment screw, usually brass or copper-colored, and a small key attached to the lanyard. It allows you to move the orienting arrow in relation to the azimuth ring.
 - All students **MUST** have a compass with adjustable declination. The presence of a declination scale does not guarantee that it can be adjusted. Avoid the 'tool-less' declination feature on the Brunton (see below).
 - Even if you already have a compass without adjustable declination, you may not use it in this course. Experience indicates that such compasses detract from the learning experience.
2. A **transparent rectangular base plate** with a direction of travel arrow or a sighting mirror.
 - Transparency allows map features to be seen underneath the compass.
 - A rectangular shape provides straight edges and square angles to plot on the map.
3. A **0 to 360 bezel** (the rotating housing) marked clockwise from 0 to 360 degrees in increments of two degrees or less. In general, bezels should be large to allow use while wearing gloves - the larger size also improves accuracy. Do not get one marked in 0-90 degree quadrants OR one marked in 0-6400 mils!
4. **Meridian lines:** Parallel 'meridian lines' on the bottom of the interior of the circular compass housing rotate with the bezel when it is turned. Longer lines are better. Meridian lines run parallel to the north-south axis of the bezel, however turned, for plotting and triangulating on the map.
5. A **ruler and/or gradient scale** engraved on one of the straight edges, used for measuring distances. In the U.S. 1:24000 scales (rather than 1:25000) are preferred.
6. A **3 to 4-inch base plate**. A longer straight edge makes map work easier.

Additional recommendations

- A sighting mirror in the cover: Reduces error introduced when moving compass from eye-level after sighting to waist-level for reading the dial.
- A liquid-filled housing: Reduces erratic needle movement (common on better compasses). In some cases, steadying the compass needle can be difficult
- An inclinometer: A gravity driven arrow that allows you to measure slope angle.

Current favorites: Silva, Suunto, Kasper & Richter, and Brunton are the common favorites. Their quality and usability varies, so **keep any receipt**. We have unfortunately seen many defective compasses in the past. Beware the UST ~\$7 knock-off baseplate compass available via Amazon and other outlets. Our gear tests show it to be unreliable.

--From Silva, with a sighting mirror, is the Silva Ranger 515 CL (not the CLQ). Without a mirror is the Silva Explorer Pro (not the 203 or Polaris). Silvas are available at Cabela's or online.

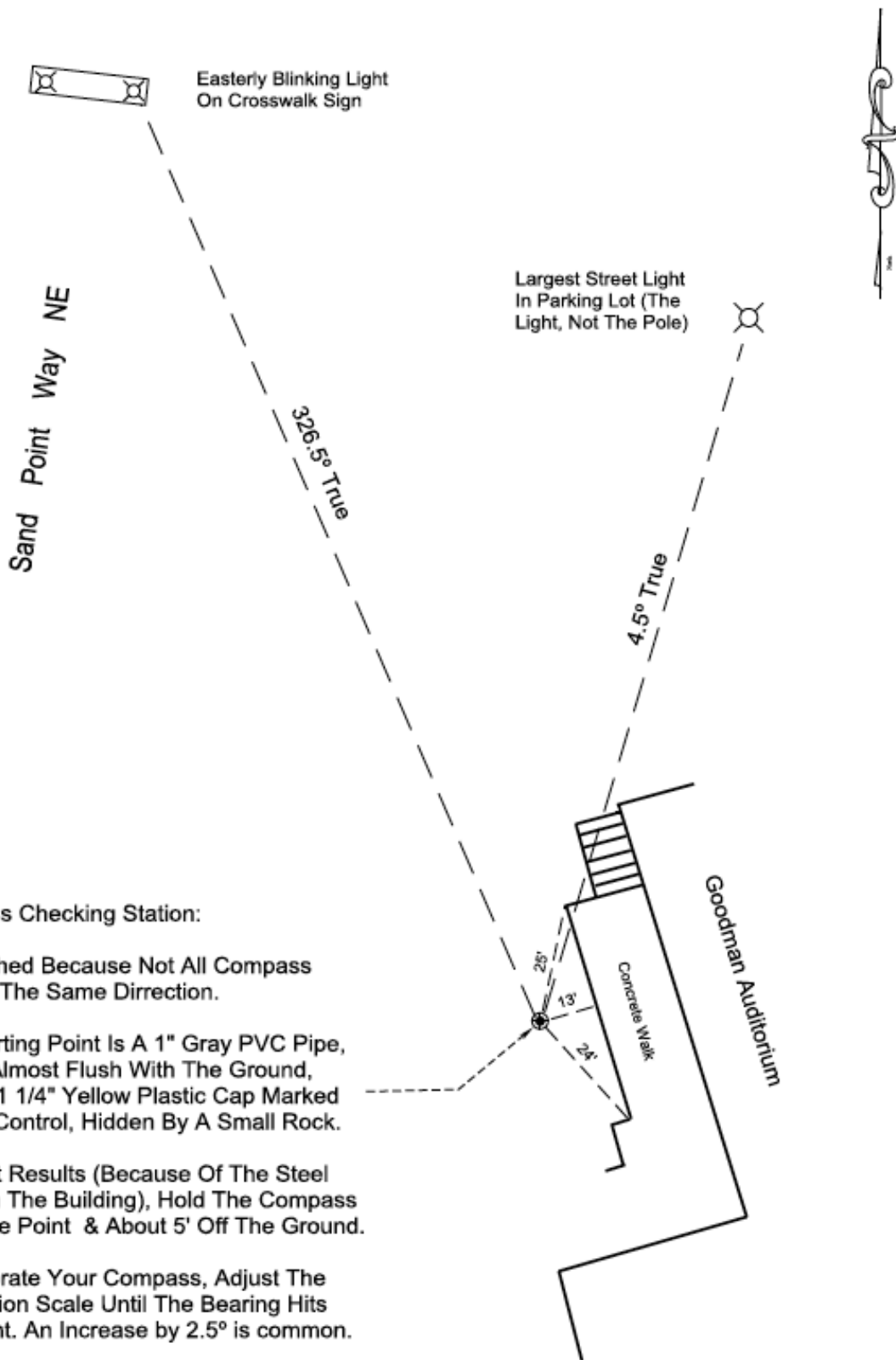
--K & R has the Sherpa and Alpin using 1:25,000 vs. 1:24,000 rulers. They are available online.

--Brunton has several compasses that meet our requirements but present issues with "tool-less declination", lack of clearly visible meridian lines or scales and curvy shapes. Several tool-less declination models have come apart in user hands. Preferred models are TruArc 15 (mirrored), and TruArc 5 (non-mirrored). The TruArc 10 has measurement scales (good) but curvy sides (not good). The TruArc 3 lacks clear meridian lines and is short. Bruntons are available at REI, Cabela's or online.

--Newly available retooled Suunto MC-2 (mirrored) and M-3 (non-mirrored) 2016 models passed all bench tests with flying colors. Suunto is currently available at REI, Feathered Friends and online.

Manufacturers make continuing improvements and corrections in models.

(Rev Mar2017/bb)



Compass Checking Station:

Established Because Not All Compass Point In The Same Dirrection.

The Starting Point Is A 1" Gray PVC Pipe, Driven Almost Flush With The Ground, With A 1 1/4" Yellow Plastic Cap Marked Survey Control, Hidden By A Small Rock.

For Best Results (Because Of The Steel Roof On The Building), Hold The Compass Over The Point & About 5' Off The Ground.

To Calibrate Your Compass, Adjust The Declination Scale Until The Bearing Hits The Light. An Increase by 2.5° is common.

Please Hide With Rock When Finished.

RWB
2/2014

Seattle Program Center Compass Calibration Station

Navigation Northwest Copy and Publish Deadlines 2017

Calendar 2017	Copy Deadlines	Publish Dates
Volume 5, Issue 4	December 1	Late December 2017

Inquiries, Contributions, Letters to the Editor to Peter Hendrickson
p.hendrickson43@gmail.com

OK to forward

OK to use with attribution

Email Navigation Northwest to any friends/outdoors partners to distribute

Guidelines for contributor submissions:

- Word doc...Google doc OK but not a PDF
- 12 pt Verdana
- Standard margins
- Indicate in body of text where you would like figs/tables etc. to go
- Send figures, tables, photos as attachments or by separate email
- Refer to figs by number in body of text
- No footnotes, header or footer
- Author blurb with preferred email contact address

Kindly contact editor for further information regarding topics, length, tables, figures, deadlines...

"Do not go where the path may lead, go instead where there is no path and leave a trail." --Ralph Waldo Emerson, American writer, 1803-1882

(Rev18Oct2017/ph)