The Mountaineers
EXPLORE • LEARN • CONSERVE

Navigation Northwest

A Quarterly Newsletter of the Seattle Navigation Committee
Volume 2, Number 2 **June 2014**

In this issue:

More on Those Suunto MC-2 Compasses & A New Calibration Station

Navigation instructor Bob Boyd reported in February that he was finished with field testing 173 Suunto MC-2 compasses. Boyd reported, "Of the last shipment of 48 compasses, 38 of them had good mirrors & 10 had mirrors that were fair, but still usable. This is a big improvement." He reported in the January issue that a December Explorer Search and Rescue training session exposed warped mirror issues with the majority of a recent shipment from Suunto. Bob indicated that Suunto responded promptly and replaced all the flawed compasses.

He said he later found that 80% of the 173 compasses were pointing to the right about 2.5º. The other 20% were pointing to the right about 4º to 5º. He examined the mirror, the lid, the hinge, the baseplate, the bezel, the needle, and the declination scale.

In Bob's words: In Part 1 we discussed problems with the warped mirrors, a problem caused by pressing a mirror, that is slightly too large, into the lid of the compass. After several emails with Suunto USA and Suunto Finland, they are now aware of the problem.

We ended Part 1 with: "About the time you've seen it all, something else shows up. Minor problems you can expect, after all, most are +/- 2º compasses. But when compass oil freezes solid, needles are painted backwards, and now we find mirrors that should be in an amusement park, it makes you ask, what's next?"

This is The Rest Of The Story and hopeful the last article, called the Field Testing. So what happens when you take the compasses with the best mirrors and field test them? We started by establishing a Compass Checking Station in a magnetically quiet area and marked that point with a yellow plastic tent peg. Next we set up an old wood and brass tripod which held an old Surveyor's transit and an aluminum body Suunto KB-14 Compass. From there it was just a matter of making magnetic observations on several objects 200' to 400' away.

So what happens when you filed test 173 Suunto MC-2 compasses at the compass checking station? We discovered 80% of them are pointing about 2.5º to the right; the other 20% are pointing 4º-5º right. Then there became the question of why? We examined and compared seven different parts of the compass (the mirror vs the lid vs the hinge vs the baseplate vs the bezel vs the declination scale vs the needle) and found very little of any one thing.

Usually, this amount of error is not a problem, but let's say it is. So how can you calibrate a 2º handheld compass? First you need a known bearing; the North Star is a little too high in the sky for most of us. Next set the compass to the known bearing and point it at the known object. If you are pointing to the right about 4.3' per 100', your compass is looking right about 2.5º. With that increase your declination. So 16º East now becomes 18.5º East. Now try pointing your compass again. About 20% of you will need to increase it more than that, so take it back to the vendor and get a new compass. A little known fact: Suunto said their 2º MC-2 Compass is specked at 2.5º.

Under Bob's direction and with support from John Wick of the Program Center Building Committee, a Compass Checking Station was established in February 10 near the rock spires outside the Seattle Program Center front entrance. Bob had earlier walked around near the climbing wall and found lots of underground metal and lots of parked cars too. Boyd indicated he didn't see anything far enough away to shoot a bearing and it remains a very dark area—that left the area opposite the northerly doors at Goodman Hall. See Figure 1 next page.

--Editor

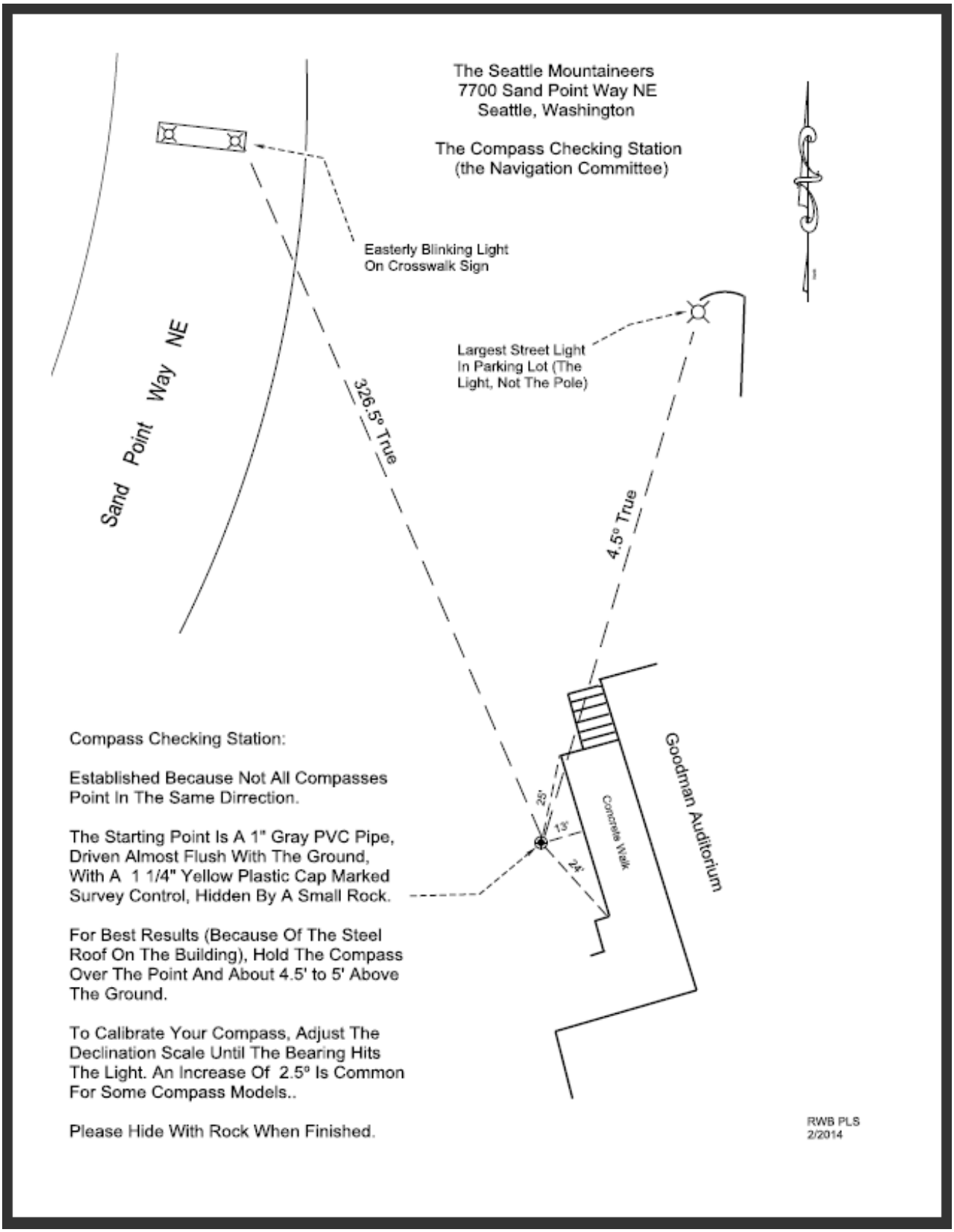
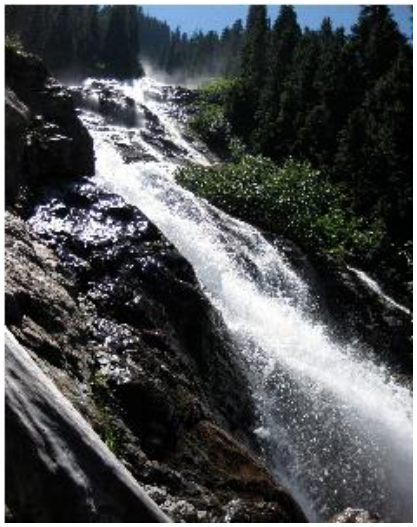


Figure 1. *Compass checking station, Seattle Program Center February 2014**.** Seattle Mountaineers Navigation instructor Bob Boyd, Land Surveyor State of Washington, King County Search & Rescue*

"Returning with no visibility…" Let me think.

By Phil Smith, M.D.

This past July [2013], I returned with Al Ellsworth to Depot Creek, a remote area of the North Cascades a few miles from the Canadian Border. This drainage is accessible only by a climber's track that leads up the creek from Chilliwack Lake in Canada. The climbers' guide confronts the issue directly, "Never tell the border guards that you plan to cross back over in the wilderness." It raises too many questions in their minds. We arrived after dark, and camped not far from a bunch of drunk Canadian yahoos with guns in their pickups racks. At least in Canada, they were nice drunk yahoos. The border, even in the trackless wilderness, is marked by an obelisk.



Depot Creek Falls is the most spectacular falls in the state, but is unknown outside of mountaineering and waterfall circles. The track passes through the spray zone of the waterfall, and continues up the left side of the cascade. At right is the first drop.



The meadows above the falls, Mt. Redoubt in the background. Our tent is the tiny yellow dot on the right end of the Ouzel Lake. At right, Mt. Spickard above Silver Lake from near the summit of Mt Rahm.

The approach was tough. With a week of food, camping and safety gear, and two ropes, ice axes, crampons and rock climbing gear, I had a 65 pound pack, big even on a good trail. We camped at Ouzel Lake in a glacier scoured basin. The lake is smaller and even more austere than it was at the time of my first visit. During the torrential rains of 2004, the lake broke through the morainal dam that had created it and emptied catastrophically into the valley below. It is now half the size it was at the time of my first visit.

The day I took the pictures above, we went to climb Custer and Rahm, both listed as scrambles. Once we got up on Custer, the route for the climb looked so loose and exposed that we couldn't believe that we were actually on route. We backed off and tried three more approaches before giving up and moving on to a more straightforward climb of Rahm.

Below: Views of Redoubt (Baker in the distance) the next day from the summit of Spickard. At right, Mt Custer.


After climbing Spickard, we returned to the pile of junk pictured above, to the exact route we had backed off of the day before. There is broad consensus in the climbing community that Custer is the worst, loosest, junkiest peak in Washington State. As we broke camp to carry our gear 2000' up to a camp on the Redoubt glacier, the clouds rolled in. Fortunately I had climbed Redoubt a couple of times before, so I was able to guide us up in a white out.

Below: clouds coming in, Al rappelling off the summit and shades of white.

Before we left, Barbara asked me if I wanted to bring the GPS. I said, "No, that in 30 years of climbing in the North West, that there had only been two times that I would have wished to have a GPS- descending Mount Olympus in a white out and approaching the Terror Basin in the rain." Make that three. Climbing Redoubt, we had dumped our tent and climbing gear on a rock in the middle of the glacier.

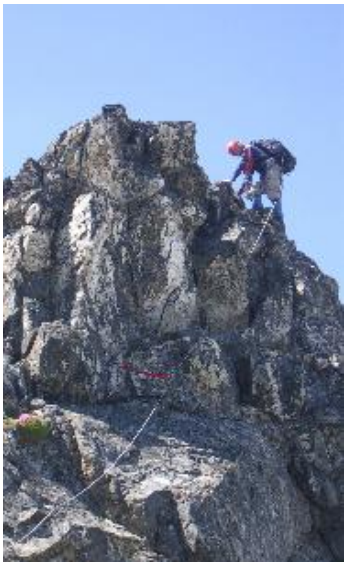
Returning with no visibility, we followed our foot prints over the broad featureless glacier above left. Except that the foot prints were hard to follow. Except that they weren't our footprints, but the Redoubt party of two days before. We felt we were on track when we intersected a fresh line of prints until they started to descend south into a drainage that I knew we had never entered. I had a topographic map and compass, but we could see nothing but clouds and gently sloping snow--nothing to take a bearing on.

I was able to approximate our location on the basis of the direction of the slope, and calculated a bearing three times, as we both thought about the possibility of spending the night on the glacier, huddled together sitting on our pack and our rope. Al said he would give me the pack to sit on since he was the one to follow the wrong footprints. We followed the bearing for a half a mile, and paused in the snow for another 10 minutes of thoughtful meditation. I took us on a sharp right up the slope, and hit the packs right on.

We set up a comfortable camp in the clouds, and the next day dawned just as socked in. That day I had the worst disaster of the trip- I finished my book (*Sailing Alone Around the World*, Joshua Slocum) before Al finished his. I tried to get him to trade before he finished, then suggested he tear it in half and let me start while he finished.

No deal. I revised our tent platform, studied the maps, neatened up the camp and walked to the top of the ridge, to see the clouds on the other side. That evening, the clouds lifted.

Below: A 4th class lead up from the glacier to north ridge of NE Mox; part of the elegant ridge ascent, with glaciers far below on each side; and a single mid 5th class lead to the summit (not shown). At right, rappelling to the glacier from the ridge on return to camp.


Climber, a bit worse for wear.

--Phil is a Family Doctor in Marysville, currently celebrating his 45th year of climbing. Al is a pharmacist at UW and has a separate life as a PA in Sultan, WA; they to plan to wrap up climbing the top 100 peaks in Washington State in early 2015. Al and Phil returned to Depot Creek last summer, climbed Custer and SE Mox ("hard Mox"). Phil noted, "Custer was as bad as I remembered it. Since everyone who has climbed Custer swears never to come back, I claim the first second ascent of Custer."

Off Trail Lessons Learned on Redoubt

By Chuck Cerveny

What they did right:

1) Partners were familiar with each other and each's skills.
2) Some familiarity with the terrain so no serious exploration involved.
3) Excellent weather window. The fog on the glacier doesn't sound too out of the

ordinary.
4) Adequate gear for the objectives.
5) Bailed on the Custer route when it looked like a big no fun. Refusal to bail on an objective seems to get a lot of skiers in trouble.
6) Didn't freak out when they realized they were stumbling about in the white-out. There wasn't any complacency in just following tracks. They calmly set about working on the problem. Mention was made that they might have to sit out the night on their packs. To me this seems to fit the old adage, "You won't be comfortable, but you will survive".
7) Had navigation gear and knew how to at least figure out the aspect they were on. From the write up I wasn't sure if they had marked the gear cache on the map.

Comment #6 is the critical one. Every time we have to go look for some lost snowshoer it seems like they start wandering around getting frantic and we get cold and tired looking for them. The franticness opens the door to bad decision making.

Maybe not so good to me:
1) Anytime I go near a big snowfield or glacier I and my partners have GPS's with us. The weather out here can't be trusted. We usually don't turn them on unless needed. If we have to turn back in low visibility we know just to follow the crappiest skin track out there. It's ours.
2) Hello? Wands? Low tech and bulky, especially with the approach, but knowing you are headed to a flat glacier recommends something beyond a compass.

I don't know if I'd even consider this one a near-miss. These guys clearly have the experience to automatically start the right protocols when something goes against the plan. They also have the perspective to know when something is going awry.

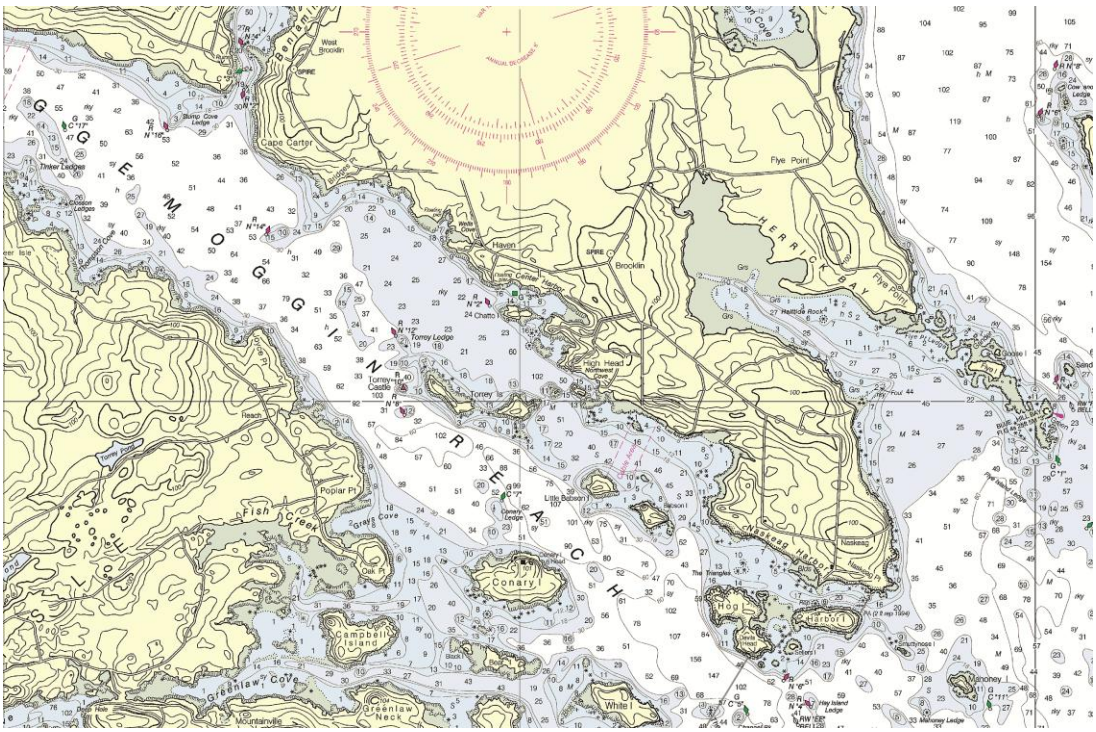
--Chuck Cerveny is a backcountry ski leader and instructor for the Foothills branch, helps with the club's youth programs and is an alpine patroller at Alpental. His first taste of "off the groomed trail" was during a summer in northern New Mexico and led to years of survived adventures in the Cascades and Rocky Mountains. Sometimes on trail, sometimes off, but preferably, above, on skis. He lives in Seattle with his family and is rehabbing from a career as a bench scientist.

Off Trail Column

We continue to seek accounts of individuals or parties who have strayed off trail/route or have been benighted or lost for several days in the Northwest. We can each learn from the fortunes and misfortunes of other wilderness navigators. The account by Phil Smith and commentary by Chuck Cerveny was inspired by a long running feature in the now defunct Sea Kayaker journal. Seattle editor Chris Cunningham set the kayaking standard for unearthing well told tales of adventure (sometimes tragic) on the water accompanied by expert reflection on lessons learned. Kindly submit your tale to the editor at p.hendrickson43@gmail. Authors will have the opportunity to respond to the critic's commentary.

End of an era in chart making

By Tom Jackson



Eggemoggin Reach near Brooklin, ME, home of WoodenBoat School.

There is something endlessly satisfying about rolling out a new chart. It's an invitation to explore, tempered by caution in the details. Little wonder that mariners let out something of a collective moan when the **U.S. National Oceanic and Atmospheric Administration** announced in fall 2013 that **lithographic printing of its navigation charts**—a tradition that dates back to 1862—**will end this April**. NOAA put the changes down to declining demand, gains in electronic and print-on-demand charts, and "federal budget realities."

It's not the end of the world. Commercial mariners are still required to carry paper charts, which will still be with us in one form or another at least as long as those rules hold. Most prudent navigators, whether commercial or recreational, have the good sense to back up whatever electronic system they're using with traditional tools, all of which are useless without paper charts. NOAA lately has been experimenting with a variety of new ideas, some of which are very interesting. Booklet Charts for small-boat users, for example, show some promise. Last year, NOAA announced a nautical chart app for Android tablets, and the idea may resurface again. Downloadable PDF charts are available as an experiment for a limited time, and they also may reappear. Downloadable electronic charts have long been available for various navigation systems used on large boats. For printed charts, NOAA will nudge customers toward commercial vendors who will print them to order.

Most yacht skippers these days wouldn't be caught dead without a high-end navigation system. I crewed on a racing yacht that had screen displays not only for the

helmsman but also on both sides of the binnacle, with another at the navigation station below, where Internet access allowed, among other things, three-dimensional modeling of the Gulf Stream in real time. In one surreal moment, in a dense fog under power, I noticed from the helm that every face was buried in a computer screen. One of the technical sessions at IBEX (International BoatBuilders' Exhibition) a couple of years ago was also an eye-opener, showing how close we are to wireless integration of marine electronics—and the ability to manage an entire motor yacht from the foredeck using a smartphone. But electronic systems can fail, or the guy who really knows how to use it all can be out of commission. I know from direct evidence that a phone can slip out of a shirt pocket and drown in bilgewater. In a knockdown or a full capsize, precious systems might be just a little too "precious."

For navigating the old way, by preference or as backup, commercial chart book providers (such as Maptech, www.maptech.com) will continue their publications unabated. Chartbooks can often be a practical choice and more convenient than large NOAA charts. Individual fold-up charts cover popular cruising grounds succinctly, often on both sides of water-resistant paper, which ends up also being cheaper than a succession of traditional charts.

For the most accurate paper charts, print-on-demand seems logical. NOAA's argument is that such charts are always the most up-to-date. But it also could mean ordering charts well ahead of departure, not swinging by the marine supply store when the need becomes apparent or after the dog rips up a favorite chart. More people will probably leave the dock without them.

Strangely, NOAA's website steers buyers to only two providers, or "NOAA-certified printers," in the entire United States: OceanGrafix and East View Geospatial, both based in Minnesota. It's also a bit bizarre that NOAA's announcement completely blindsided maritime professionals. Here in Maine, Hamilton Marine, which is an excellent chandlery, knew nothing of the pending change until NOAA's press releases went out. Phil Dion, who handles charts and navigation electronics in the Searsport headquarters, said the company as of November hadn't had time to analyze what the change would mean for them. "We're still up in the air about it, and we haven't had time to digest it," he said. One option he mentioned was investing in a large-format printer of the store's own. These NOAA charts, created with public financing, are absolutely in the public domain. There has always been a public-private symbiosis, with the goal of disseminating accurate charts as widely as possible. Anybody should be able to print them.

Meanwhile, NOAA's other options are worth a look. During the 2013 season, I gave the new Booklet Charts a try. I found them useful for close-up views—supplementing my hand-held GPS. But the pages have to be kept dry, which can be difficult on an open boat. The binder itself has to be weatherproof. Unlike typical chartbooks, not all of the pages have compass roses. But what is really missing in the Booklet Chart, just as in any small hand-held GPS display and many chartbooks, is the big picture. Something more is essential. When planning a long crossing or strategizing routes based on wind and weather, the traditional NOAA charts covering a larger area really shine. The new PDF charts—and I downloaded quite a load of them while they were available—can help.

They can be examined on the computer or cropped and printed for use. But the files are large and the process is cumbersome. I often plan my routes at home, then transfer information to tighter-focus charts for use on the boat, and for that there is no substitute for a real chart. Even if I have a chartbook, I usually take folded-up charts along.

Paper charts, of course, have a long and honored tradition. The charts and coastal views made during Capt. James Cook's Pacific explorations in the 1700s were so well done that they were still in use during World War II, often as the only charts available. Chart making on that level is an art form. In a fine bit of irony, one of the best ways to view historic paper charts today is—what else?—online. Browse the David Rumsey Map Collection (www.davidrumsey.com) in California or the Osher Map Library (www.oshermaps.org) in Maine for a feast of maps, from the fabulous to the outright fraudulent. Each one is an insight into the maker's conception of the universe, or at least a corner of it.

The conception of the universe that I regret is the one in which faces are all glued to computer screens. Without practice, the instincts of watchfulness and listening intently are poorly honed, and valuable skills can wither. In our conception of the universe, we are blips on a screen. We always know precisely where we are and too often have lost any clear concept of why we've come there.

--Tom Jackson is WoodenBoat's senior editor. This item was first published in WoodenBoat magazine No. 236, January/February, 2014. Reprinted with permission. Find WoodenBoat at http://www.thewoodenboatschool.com/index.php. Tom and my childhood friend, David Wyman, have co-led the annual Small Reach Regatta for sail/row small craft along the rocky, Maine coast (http://www.smallreachregatta.org/). I've been lucky to sail, row and chase boat for several years with other Amherst (MA) Regional HS Class of '61 graduates. No surprise, there is considerable climber/sailor overlap near Puget Sound and some shared distress at the loss of government-printed USGS topo quads.

More on those new USGS Quads

Several rounds of SurveyMonkey feedback after Basic Navigation Workshops tell the same story:

> If the examples of the "self-printed" maps I saw Wed, are going to be the typical map available, navigation by them will be almost impossible. Such bad resolution, color, and squeezing the contour lines into a mash-up because of the smaller size. Not a pretty sight.—*Experienced Navigation Instructor*

> I personally found recognizing features on the topo maps to be less obvious -- e.g. where was the true peak, what exact point am I taking this bearing from, etc. I found some of the ambiguity/printing in the maps to be fairly bad, e.g. wtf is the trail head for this trail.—*Navigation Student*

Peter, we're going to need to rewrite some of the story problems we've used successfully for many years. The students simply can't find those objects on the map.—*Even More Experienced Instructor.*

The best thing we can do is have many people tell them about the problem in their own words. Here's a link where anyone can provide feedback to the USGS: http://answers.usgs.gov/cgi-bin/gsanswers?pemail=ask

Please do share this with anyone who'd like to send their comments to the USGS.
--Editor

Links, Apps of Interest

- Here are 40 Maps that will help you make sense of the world: http://asheepnomore.net/2013/12/29/40-maps-will-help-make-sense-world/
- If you get a kick out of aviation navigation, check out FlightAware's live flight tracking feature to watch Seattle Area (or several other major metro areas) incoming and outgoing flights in real time. See http://flightaware.com/live/airport/KSEA. With Earth View, you see terrain features. Yes, they fly over Bainbridge Island but around Mt Rainier.
- How to read a (good) map. Directions Magazine January 27, 2014. Grab screen shot of map? http://www.directionsmag.com/articles/on-how-to-read-a-good-map/369257#.UurS_r0hdyg.gmail

Navigation Gear

- Trans-Atlantic conversations continue between local ESAR and Mountaineers Navigation leadership with Suunto corporate in Finland to address issues with the popular MC-2 series compass.
- Overheard in yet another Search and Rescue conversation about faulty compasses: "A compass with a bad mirror will not work for a signaling device. A concaved mirror will not reflect light worth a darn. We have tried it on the job."
- The DeLorme InReach SE GPS with SMS was featured in a Himalayan crevasse self-rescue tale spun out on Facebook [http://www.climbing.com/news/climbers-himalayan-rescue-plays-out-live-on-facebook-warning-graphic/]. Mountaineers GPS instructor and Navigation Committee member Bruce Crawford commented on available GPS/SMS and PLB devices [both available from REI]:

"There are two of these that are aimed at the hiker through climber market. Others are aimed at the yacht racing market.

"Spot has one way preset messaging. InReach has two way and variable messaging. Spot is cheaper, more heavily marketed, and uses the Globalstar system. InReach is about double the expense and uses the Iridium network. Globalstar has had problems with satellites, and has other limitations (no polar coverage, no coverage in areas w/o ground stations like Africa). Both satellite networks used for communication, Globalstar and Iridium, are low earth orbit. This means if you are in a valley it can be a while before a satellite is visible for communication. Spot is 0.4 watt. InReach is 1.6 watt and is a bit heavier. As a

general rule, power and antenna configuration are important to successful transmission when the satellite is visible.

"The other thing you can use is a personal locator beacon (PLB), such as the ACR reqlink 406. No messaging, no annual fee (but a 5 year battery change and service), 5 watts out to satellites that are higher up. If you want an SOS to get out, a PLB is a better bet as the power is higher and it is more likely a satellite is visible (assuming you are conscious to activate it). If you want to leave a track and send messages, look at Spot or the InReach. If you are paranoid, and willing to pay the cost, do both a PLB and InReach."

Courses

The Basic Navigation Course is offered five times across Fall and Winter/Spring. Any evening map and compass Workshop may be paired with a subsequent Field Trip that Fall or Winter/Spring. The Fall 2014 pair, both Workshop and Field Trip, is listed below. The fee is $55. Sign up as either STUDENT or INSTRUCTOR (see instructor details below). Mentor two-hour, evening sessions for those needing a bit more instruction before the field trip are also included. Successful students are awarded a Basic Navigation Course Badge. Fee.

The Basic course does not include GPS-assisted navigation. A new Assisted-GPS class for smart phones is under development.

29 Oct 2014	Basic Navigation Workshop	Seattle Program Center
06 Nov 2014	Basic Course Mentor Session	Seattle Program Center
08 Nov 2014	Basic Navigation Fieldtrip	Heybrook Ridge, Index

Classes

Introduction to Map & Compass two-hour evening classes are offered 6 times each year. Loaner maps and compasses are provided. The fee is $20 members and $25 others. This class does <u>not</u> satisfy requirements for Seattle scramble, climb, snowshoe or backcountry skiing courses. Fee

19 Jun 2014	Introduction to Map & Compass	Seattle Program Center
18 Aug 2014	Introduction to Map & Compass	Seattle Program Center
17 Sep 2014	Introduction to Map & Compass	Seattle Program Center

Clinics & Seminars

Many wilderness navigators consider a dedicated GPS an essential tool. Many more are now using smart phones in place of a dedicated GPS device. Development continues for a Smart Phone/Dedicated GPS clinic to replace the former Dedicated GPS device clinic. Navigation instructors were invited to enroll in an evening pilot session to test the new clinic. No fee.

05 Jun 2014	Pilot Smart Phone/Dedicated GPS Clinic	Seattle Program Center

The Navigation Committee invites Basic Navigation Course graduates to volunteer as novice or experienced instructors. New instructors will be paired with an experienced instructor at both the Workshop and the Field Trip. Instructing at both events will renew your Navigation Card for a period of three years. New instructors who have completed the Seattle Basic Navigation Course are strongly encouraged to attend an evening instructor training clinic. No fee

09 Oct 2014 Basic Navigation Instructor Clinic Seattle Program Center

Navigation Projects/Stewardship

Stewardship opportunities are offered through the Seattle Navigation Committee. The annual fall Brushout With Cookies clears a year's growth from the stump area under the power lines and along the forest road on Heybrook Ridge. Volunteers renew the sight lines for later fall/winter/early spring student Basic Navigation Course compass work. Many hands make for a productive half (or two-thirds) day. Qualifies for stewardship with various committees. No fee

04 Oct 2014 Brushout With Cookies Stewardship Heybrook Ridge, Index

King County Libraries invited the Seattle Navigation Committee to provide introductory sessions to library patrons. Instructors Paul Thomsen, Mary Aulet and Peter Hendrickson meet for an extended hour with some 30 Kirkland Branch patrons March 31. There were many questions about compasses and basic map skills.

Paul Thomsen of the Seattle Navigation Committee led the annual navigation clinic for Rare Plant Care naturalists at the University of Washington Center for Urban Horticulture March 29. The naturalists help preserve the flowers we often enjoy on the mountains. Navigation skills help them get to the flowers and record the areas they're growing in. Instructors included Wes Rogers, Pete McCormick, Brian Starlin, and the Rare Plant Care program manager, Wendy Gibble.

Our work advances with improvements to existing practice and additions to the suite of services. In every case, volunteers are the key. Email Committee Chair Peter Hendrickson if you are interested in any of the current projects below.

- Seeking post production editor for YouTube supplemental videos to accompany the Basic Navigation class.
- Seeking Navigation Northwest Newsletter section editors—book reviews, gear, web sites, smartphone apps...

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

OK to Forward. OK to reprint with permission.

Email Navigation Northwest to any friends/outdoors partners to distribute

"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*

(Rev. 5jun2014/ph)