



# THE DRUM



A Publication of the Seneca Sail & Power Squadron

**In this issue...**

From The Commander ..... 1

From the Education Officer .....3

Youth Committee Report .....4

Upcoming Classes and Seminars.....6

USPS News from District & National .....6

Useful Weather Websites & Apps for Cruisers .....7

Leap Seconds: More Than You Ever Wanted To Know .....8

The Last Word .....10

Calendar of Events ..... 11

Report any errors or omissions to:  
editor@SenecaPowerSquadron.US

- Please join the Bridge in welcoming our newest members to the Seneca Sail & Power Squadron family!
- Frank & Cris Broderick, Family Members & Sail Students
  - Nicolas Burdick, Junior Sailor
  - Daniel Kingsley, Family Member, Seamanship Graduate & Sail Student
  - Ken & Sherri Mansfield, Family Members and Seamanship Graduates
  - Samuel Michel, Junior Sailor
  - Nathan Slack, Junior Sailor

## From The Commander

*By Mark Erway, AP*

### View From The Bridge

It’s haul-out time again, and it is always a difficult season of the year because it signals that time where we have to become armchair sailors for too many months. But one thing we can be thankful for is that we had a spectacular summer with more good weather overall than we’ve seen in the last couple years, and a safe summer, too. And the fall colors have been absolutely spectacular!

So now that we’ve all got tons of free time on our hands (tongue in cheek), check out our website to see what classes are being offered during this off-season; maybe this is a good time to take that course you’ve always been interested in. I’m signed up for the JN class and am hoping to see it all the way through this year.

I recently completed the online version of America’s Boating Course through the USPS website for two reasons. First, because I had never taken the course and even though it’s not required of me at my advanced age, I wanted to see how it was presented by USPS; and second, simply for my own edification. Good coaches always stress the basics to their teams, and ABC is a good reminder of what all boaters need to know. Also, as a VSE I can share firsthand knowledge of the information contained in the ABC course with the boat skippers. The cost is \$30, the course presentation is done powerpoint style with test questions at the end of each section. You can easily



download the 288-page manual and when you get through all the study chapters there is a mock test that helps you determine if any area needs a bit more study. When you’re ready just click on the exam button and away you go. If you pass you will know it immediately and receive your qualification info.

[www.americasboatingcourse.com](http://www.americasboatingcourse.com)

Our last meeting of the year will be November 7<sup>th</sup> and our guest speaker will be Jeff Freedman of Syracuse. Jeff is a long time USPS member from the Syracuse Squadron and currently our District 6 Executive Officer. Last July he brought his Trojan F36 cabin cruiser to Watkins to take part in the 2016 D6 Rendezvous and that gave us an opportunity to get to know him even more. When we were at the Crow’s Nest Restaurant with the other rendezvous participants, he graciously offered to come and speak to us. He has chartered many times in the Caribbean so he knows what he is talking about. I hope you can all make it to hear his presentation on boating/chartering in the Caribbean.

As we close out this year I am already looking ahead to 2017 and at those

things that make Seneca Sail and Power a relevant presence in Schuyler, Chemung, and Yates counties. The Coast Guard says their next biggest recreational boat challenge is the explosion of people getting into paddlecraft, and I wonder how we are positioned to address that area, and if not what do we need to do?

When I was doing a series of Vessel Safety Exams on the canal we witnessed two accidents at the public launch plus other minor infractions. The locals said that it goes on all day long and they wondered if our squadron could do something to help. When I visited another marina on the canal the owner said he would be very happy to have squadron representatives come and do Vessel Safety Checks, pass out informational pamphlets and even hold seminars if we wanted to.

So I wonder, how can we respond to this very real need and an open invitation? How do we combine the civic service component of our squadron with the precious few hours of leisure time that each of us has? How can we find time to enjoy boating with our friends and family and still help our fellow recreational boaters? How can we spread the load out so that 20% of the membership isn't carrying 80% of the load?

We've already got the educational material. But our biggest asset lies in our great members. Our membership list shows about 85 names, and of those about 30 persons are capable of helping out at a seminar like a "flare up", or a PFD demonstration. Instructors need help registering people, coordinating materials, tables, chairs, coordinating with fire departments and police agencies, arranging for refreshments or

staffing a table to hand out information packets. We could hold an event at the Village Marina, or at the Glen Harbor Marina, or at Billy Bob's or at Geiger Marine, while certified instructors do the actual teaching and VSE's do their VSC's and members taking care of the supporting that effort. Let's not miss the opportunity to have some sort of presence at major events taking place in Watkins, like that PWC race weekend over in front of Clute Park. Maybe a member could "adopt" a boat sales place near where they live, or one that they pass by regularly, and see if we could keep some flyers and pamphlets on hand at the counter. Together we can rise to the new challenges facing our waterways. Together we can accomplish our civic duty and have fun doing it.

Last, but not least, a number of our Bridge positions have been vacant for too long. We've not had an XO for two years, or a Secretary for more than a few months at a time. Others on the Bridge have served multiple tours of duty and that's not the way it's supposed to be. Your squadron could use your help to make sure we can fulfill our mission of "safe boating fun through education".

My hope is that we will work out a plan for 2017 that will stimulate member involvement in a very real and enjoyable way. At the same time, we can help our fellow boaters and make new friends while doing it.

God bless,

- *Cmdr. Mark  
SV F5*

[cmdr@SenecaPowerSquadron.US](mailto:cmdr@SenecaPowerSquadron.US)

## The Drum

*Published six times per year by the Seneca Sail and Power Squadron, a unit of the United States Power Squadrons. The opinions expressed in **The Drum** are those of the authors and do not necessarily represent those of the Power Squadrons, its officers, directors, or members.*

### General Information

[info@SenecaPowerSquadron.US](mailto:info@SenecaPowerSquadron.US)

### Commander

Mark Erway, AP

[cmdr@senecapowersquadron.us](mailto:cmdr@senecapowersquadron.us)

### Executive Officer

[Position Vacant]

[xo@senecapowersquadron.us](mailto:xo@senecapowersquadron.us)

### Administrative Officer

Karen Stewart

[ao@senecapowersquadron.us](mailto:ao@senecapowersquadron.us)

### Education Officer

Thomas Alley, SN

[seo@senecapowersquadron.us](mailto:seo@senecapowersquadron.us)

### Secretary

[Position Vacant]

[secretary@senecapowersquadron.us](mailto:secretary@senecapowersquadron.us)

### Treasurer

Marcia Taylor

[treasurer@senecapowersquadron.us](mailto:treasurer@senecapowersquadron.us)

### Assistant Education Officer

James McGinnis, AP

[aseo@senecapowersquadron.us](mailto:aseo@senecapowersquadron.us)

### Public Relations Officer

Howard Cabezas

[pro@senecapowersquadron.us](mailto:pro@senecapowersquadron.us)

### Vessel Safety Check Chairman

Don Kloeber

[vsc@senecapowersquadron.us](mailto:vsc@senecapowersquadron.us)

### Web Site Administrator

Thomas Alley, SN

[webmaster@senecapowersquadron.us](mailto:webmaster@senecapowersquadron.us)

### Youth Committee Co-Chairs

Katie Alley, P

[katie@senecapowersquadron.us](mailto:katie@senecapowersquadron.us)

Maggie MacBlane, S

[maggie@senecapowersquadron.us](mailto:maggie@senecapowersquadron.us)

## From the Education Officer

By Tom Alley, SN

SV Tomfoolery



One of the advantages of being the editor of the District 6 newsletter is that I get to see all of the latest announcements in a timelier fashion than I would as a member or even as a Bridge

Officer in our squadron. Since I just finished wrapping up the content of the latest issue of *The Deep 6*, there were some announcements there in the DEO's column about some changes coming to USPS educational courses. I highly recommend you read Ken Greene's article in this month's district newsletter. Better yet, make a day trip to the District's Fall Conference on November 5<sup>th</sup> in Binghamton and hear Ken expand on some of the changes that are being piloted.

In other news, a recent e-mail exchange I had with Assistant National Educational Officer (ANEO) Steve Abbott over some policies I had asked to be clarified indicates that we can expect the cost of student materials for classes and seminars to continue to increase. There are a number of factors contributing to this unfortunate circumstance, many of which are well outside of our control at the squadron level. While these courses are still a great value, no one wants to see costs continuing to increase like they have.

The bottom line? If there is a course you'd like to take, request it now. It will only get more expensive if you wait.

Want to help reduce costs? In the end, it all boils down to membership. We each have to do our part, at the local level, to ensure our membership level stays constant or, better yet, increases.

### Course Updates...

#### ...Sail

Our eight Sail students have completed their studies and have taken their final exam. Results should be available shortly. Feedback received on the course was very positive.

#### Junior Sailing

Two of our Junior Sailors, Katie Alley and Maggie MacBlane, gave a wonderful presentation at the last Squadron Dinner on October 3<sup>rd</sup> at Tag's Restaurant. Their talk was a recap of the Junior Sailing cruise to Lake Ontario early in the summer. Their presentation was capped off with a catchy music video they made with some footage recorded during the trip. If you didn't go to this, you missed a really good program!

#### On The Horizon

You may have noticed that we have not held classes at the Big Flats Community Center since the beginning of the year. This is because the Village Board voted to substantially increase the fees charged to non-profit organizations who use the facility. Simply put, if the Squadron were to pass those costs on to the students we would have to charge an additional \$250 to \$500 *per student* for each course.

If you just muttered something under your breath, then I'll bet it was similar to what I said when I received the letter from the Village.

As a result, we are looking for places where we can hold future classes. If you know of a facility that would be willing to host us, please let me know so that I can contact them to see if we can work out a mutually beneficial arrangement.

### One More Thing...

Our Squadron web site is beginning to become a bit dated, so there has been some work going on in the background for a significant face lift and retooling of the site. The new site will boast some enhanced features that include discussion boards, member blogs, and other interactive capabilities. Stay tuned for announcements on when the new site will be rolled out!

- Tom

[SEO@SenecaPowerSquadron.US](mailto:SEO@SenecaPowerSquadron.US)

o o o o o

*Since we are in the final stretch of the US elections, I thought it appropriate to share what I think is the best election poster I've seen so far this year...*

*Now that you're smiling, don't forget to vote!*



# Youth Committee Report

By Katie Alley, P

[Check out the Nov/Dec 2016 issue of Good Old Boat magazine, where Katie has an article appearing on page 56. Congratulations on becoming a nationally published author, Katie! - Ed.]



The onset of fall created some interesting and some really unamusing racing conditions, but

nevertheless the Junior sailors were able to put their newly acquired skills to action.

First off, congratulations to Junior Sailor Henry, who was able to participate in the annual cruise to Geneva aboard *Ruthie*. *Ruthie* finished in 5<sup>th</sup> place in Seneca Yacht Club's Navy Barge Race. Out of the four Catalina 22s that raced, *Ruthie* finished 2<sup>nd</sup>. The trip provided them with beautiful weather and fair winds.

With the conclusion of the Finger Lakes Yacht Club's summer racing series in September, the Junior sailors were well represented once again in the season standings. Junior sailing boats took the top two positions this year. Congratulations to *Ruthie* who took 1<sup>st</sup> place and *Tomfoolery* who took 2<sup>nd</sup>. Also a big congratulations to the other Junior sailing boats who participated in the races this season: *Tark*, *Seek Ye 1<sup>st</sup>*, *Brewster*, and *F5*.

Additionally, congratulations to all participants in the FLYC's unscored season-finale races. During the staggered-start Grape Harvest Race, racers faced some confusion and on-the-fly planning when it was discovered that both the east and west race marks were missing. Racers resorted to using a piling near the salt plant as a mark, with some course alterations. At the end, during a very light air moment, *Tomfoolery*

proudly took last place a mere few feet behind *Ruthie*.



The Gear Buster Race bestowed some more exciting conditions, as *Brewster* busted some sail slides and nearly busted herself on the break wall near the salt plant after some broaching and accidental-jibing action.

Members who attended the squadron dinner on October 3<sup>rd</sup> were able to hear Maggie MacBlane and me present the Junior Sailors' Lake Ontario and Bust Cruise that took place earlier this summer. (Originally we planned for this cruise to be Lake Ontario or Bust, but we ended up doing both – reaching Lake Ontario and busting some equipment.)

From the youth committee, it was very fun to share our entire experience and we hope that you enjoyed hearing *all* about it. (Just a reminder, we did more than almost dismast *Tomfoolery*.) We also really hope that we made more of you feel so adventurous that you'll join us for next summer's cruise. (We'll be going to Canada, *on purpose*.)

Finally, since this is the end of the 2016 season and the last edition of *The Drum* for the year, we want to say a big **thank you**. Thank you to everyone who participated in or supported Junior Sailing in any way this season – students, parents, coaches, squadron members, yacht club members, crewmembers, BBQ attendees, Facebook page likers, Instagram followers – everyone. Without you, our program

would cease to exist. Your continual support allows us to grow and keep educating a new generation of safe boaters. We had a fantastic adventure-filled season and we all sincerely hope that you'll join us again next year. As we say on *Tomfoolery*, it was "lit". In the meantime, stay in touch for more educational opportunities and social events, as our squadron remains active throughout the winter.

To conclude this year of boating, I would like to include some of the most amusing quotes I heard around the marina this season. I have been writing them down since this spring and I hope that you find some of them as funny as I did. I won't include the speaker of every quote, so have fun guessing who said what.

o o o o o

"What's the name of your boat?"

"Sh... sch... I don't even know how to pronounce it. It's the bumblebee boat!"

o o o o o

"Are you gonna name your boat?"

"No, it's staying 'F5' because I don't think I'm going to have any emotional connection with it."

o o o o o

[Day 12 of Lake Ontario Cruise]

"We planned mutiny the second day of this trip."

o o o o o

Maggie: [sneezes]

Captain Tom: "Are you getting sick?"

Katie: "No, she's probably just allergic to Captain's bullsh\*t."

o o o o o

Captain: "Did you secure the anchor?"

Crewmember: [eyes get wide and lower jaw drops] [shakes head slowly]

o o o o o

[poorly placed glass container of salsa falls from a shelf as boat heels] [loud crashing sound]

Captain: "Did it land in one piece?"

Crewmember: "¡AYE MI SALSA!"

o o o o o

[sailing near Canadian border]

Captain: "What does the red and white buoy mean?"

Crewmember: "Canadian pride."

o o o o o

[Returning to marina]

Dock neighbor: "Well I'm glad you all survived... this boat has cheated death again... many times!"

o o o o o

[Skipper has mainsail hoisted while still tied up in his slip in the marina]

Dock neighbor: "Catching wind for later?"

Skipper: "No, I'm going to back out under sail. What could possibly go wrong?"

o o o o o

Loudspeaker: "Tickets are still available for Captain Bill's..."

Dock neighbor: "You hear that Tom? Tickets are still available!"

Captain Tom: "Hey cool!"

Dock neighbor: "One thing you can always count on, in this world of uncertainty, is that tickets are perpetually available."

o o o o o

Dock neighbor: "Katie, did you hear the good news?"

Katie: "What?"

Dock neighbor: "Tickets are still available!"

Katie: "Oh yeah!"

Dock neighbor: "That makes me feel so good! I'm glad they announce it every hour!"

o o o o o

"Are you going sailing?"

"No, maybe boating."

"So, drinking."

o o o o o

Powerboater: "Is the wind blowing?"

Sailor: "No."

Powerboater: "Well, we know what that means!"

Sailor: "Yeah, drinking!"

o o o o o

[motor boat wake approaching while drifting in the middle of the lake on a calm day]

"A ROGUE WAVE!"

[boat barely rocks as wake passes]

"Wow, almost capsized that time."

o o o o o

"Look! A white duck! Oh wait, that's a seagull."

o o o o o

[Skipper arriving back at the dock after finishing a race in last place]

Dock neighbor: "How'd you do in the race?"

Skipper: "We had a good time."

o o o o o

Dock neighbor: "So I have a message... don't shoot the messenger here. But someone said..."

*Tomfoolery* crewmember: "Was it Denis?"

Dock neighbor: [glances at Denis] "Now, now, I'm not saying names but in response to Tom saying that 'real sailors don't need engines', someone wanted to point out that you have two engines and neither of them work."

Captain Tom: "Not true! I've had three and none of them work!"

o o o o o

[heard on the radio]

"*Tomfoolery*, the usual race mark isn't here."

"I think it's right in front you, *Ruthie*."

"...That's not it."

"Well that's the one Mike went around."

o o o o o

"Is Mike on port or starboard?"

"It doesn't matter; Mike is a pirate."

o o o o o

[planning to go sailing, winds less than 10 knots]

"If we pitchpoled on Seneca Lake today, how many headlines do you think we would make?"

o o o o o

And lastly, an inspirational quote, spoken after our Lake Ontario Bust:

"That's the only way to learn – to face your fears."

"And that's why so many boats never leave the harbor."

o o o o o

Like us on Facebook:  
Seneca Junior Sailing

Follow us on Instagram:  
@senecajrsailing

Follow us on Twitter:  
@senecajrsailing

# Upcoming Classes and Seminars

By Seneca Squadron Education Department

## Course Choices

The USPS offers a wide variety of classes. As such, it can be confusing which one you might want to take. On the other side of the table, it can be equally confusing for the Squadron Education Department to figure out which classes to offer.

Here is a list of classes and the year in which they were last taught by the Seneca Squadron:

- Seamanship (2016)
- Piloting (2015)
- Advanced Piloting (2014)
- Junior Navigation (2015)
- Navigation (2012)
- Cruising & Cruise Planning (2015)
- Engine Maintenance (2011)
- Marine Electrical Systems (2009)
- Marine Communication Systems (2009)
- Marine Navigation Systems (never)
- Operations Training (2013)
- Instructor Development (2015)
- Weather (2012)
- Sail (2016)

Based on when some classes were last offered, you might say we're "due" for some electives like the Marine Electronics series or Weather.

Looking at things in a different way, about half of our members have taken either Seamanship (53%) or Piloting (43%), our two introductory courses in the Advanced Grades series. As you move up the sequence, participation drops off rapidly with Advanced Piloting (26%), Junior Navigation (8%) and Navigation (4%).

Of our electives, the most popular course we have is Weather, with 27% of our members having taken it. This is followed closely by Sail (22%), Cruise Planning (18%), and Engine Maintenance (16%). Of the remaining electives, 11% have completed the Marine Electronics series of 3 courses, 14% have completed Instructor Development or Instructor Qualification (its predecessor) and 10% have completed Operations Training.

However, 43% of our members have not taken a single class. That's almost half.

Now, not everyone wants to navigate across oceans, rewire a boat or become an instructor, but you might think that if someone joins an organization that specializes in boating education, they want to take at least one class? Tell me what I'm missing.

## What's Next?

You tell me! What classes are you interested in taking while we wait for the next boating season to begin?

Send your requests to:

[SEO@SenecaPowerSquadron.US](mailto:SEO@SenecaPowerSquadron.US)

o o o o o

**Policy reminder:** It has been our practice in the Seneca Squadron to offer scholarships to our outstanding students. If you receive a perfect score on the final exam of any of the Advanced Grade or Elective courses, the next course is on us! (In plain English: It's free. No charge. Gratis. Got it? Good! Now sign up for one of our classes!)

## USPS News from District & National

### Non-Member Exam

#### Surcharge

Effective December 1, 2016, there will be a \$20 fee for all non-member passed exams assessed as a separate charge to the squadron treasurer. The purpose of the fee is to offset the various costs incurred in processing and maintaining records for the non-members. This fee does NOT apply to America's Boating Course®.

Most squadrons already charge an additional fee to non-members taking a class and this additional cost should be anticipated in your pricing of future courses. Obviously, the best case is to convince the prospective student to join the squadron and take advantage

of the member pricing. If you have a class underway prior to this announcement that includes non-members, please let me know the names of these students so I can notify Headquarters.

Be aware that under no circumstances should you give the student a choice of avoiding this exam fee by not taking the exam. We cannot predict the future needs of any student; we receive regular requests for documentation of course completion.

Please address questions to R/C Steve Abbott, ANEO, at

[srabbott@att.net](mailto:srabbott@att.net)

### Tomfoolery Forestay

#### Failure Update

By Tom Alley

Working for a large, multinational corporation has its advantages. One of them is that there are lots of experts accessible when you have a complex, technical question requiring a specialist.

If you recall, our near dismasting occurred when the clevis pin holding on the forestay failed by shearing into two pieces while under load. At first I believed the problem was metal fatigue and that I had missed seeing a crack in the pin when I last inspected it. Staining on the fracture face was

thought to be due to corrosion found on the cotter pin. Metalurgical analysis of the fracture face proved otherwise. In fact, it produced a number of surprises.

First of all, it was not metal fatigue, but corrosion that caused the failure. As the corrosion propagated across the pin, its structural strength lessened until it could no longer support the load and it failed.

Second, the corrosion started on the *inside* of the clevis pin in the hole for the cotter pin. This means the corrosion was invisible from the outside of the pin. This is why it was not noticed prior to the pin's failure. The following photo shows the detail of the fracture face. You can see that

the darker (corroded) areas are on the inside and that the outer surface has bits of bright (uncorroded) metal on it. (Is that what is meant by a silver lining?)



Third, the composition of the pin was not the bronze I believed it to be. In fact, the pin has a composition that is not typical of any marine alloy:

- 44% Nickel
- 32% Copper
- 18% Zinc
- 5% Chromium

As of this writing, we have not been able to match this composition with any commercial alloy.

So now it appears that there is yet another thing for boat owners to worry about, and that is whether the supplier of your clevis pins is reputable. This pin came with the boat when I purchased it, so I don't know where it came from. The new pins were all purchased from a known supplier and are confirmed to be 316 stainless steel.

## Useful Weather Websites & Apps for Cruisers

Don Kloeber, AP – SSPS Wx Instructor

MV Bacchus

No matter what kind of boating you do, an awareness of the weather is a key component of planning and decision making. Here are some of the websites and apps I have used and find helpful. (Note: I'm an Android user so you Apple folks may have to look for the counterpart to these.)

### For everyday Wx forecasts:

I use and like the **Free NOAA Unofficial App** - for Android  
Provided by Granite Apps

Here is the Website link w/ more info & details:

<http://tinyurl.com/mh8fpr6>

A few excerpts below:

*This weather app is not affiliated with NOAA or the National Weather Service. Products provided by NOAA are in the public domain, and this app's use of those products is compliant with NOAA/NWS terms of use.*

*This app provides forecasts, animated radar, hourly forecast, and current conditions, all in an intuitive and easy to use interface. Just the information*

*you need, provided accurately, quickly, and for your exact location.*

*If there is severe weather, you will see a red warning icon in the corner of the current conditions icon. You can press this icon for more details. This app currently does NOT support severe weather alerts or notifications. NOAA is providing this service directly through cell carriers. You can read more about the service at:*

<http://tinyurl.com/6mwogwq>

There are a few features that make this app useful and easy to use:

- It has 3 basic tabs – **Forecast**, **Hourly**, and **Radar** – that allow you to select the type and level of detail you find useful.
- In the menu – **Tab Options** – you can choose what data you would like to display from a list of about 10 available. We usually stick to basics temperature, wind speed, probability of precipitation, but you have the choice to look in more depth if/when desired. Having wind speed & direction is helpful when planning for the

day's activities whether a casual cruise or a Lake Ontario crossing.

- From the menu you can select **Forecast Discussion** that presents the NWS synopsis for the area you are in.
- I find the written / graphical presentations much easier to comprehend and remember than listening to VHF weather broadcasts

### For more detailed / graphical wind info

Many of us boaters have a desire for wind information – some of us wishing for or trying to find more wind others wishing to avoid it as much as possible. Below are a couple of additional resources I've found especially to be helpful relative to the wind.

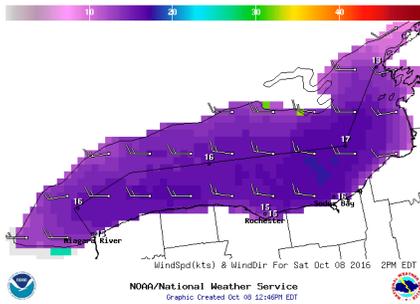
### NOAA Great Lakes Digital Graphical Webpage –

<http://tinyurl.com/jne3nnz>

We have found this site useful for planning cruising on Lake Ontario (or other Great Lakes).

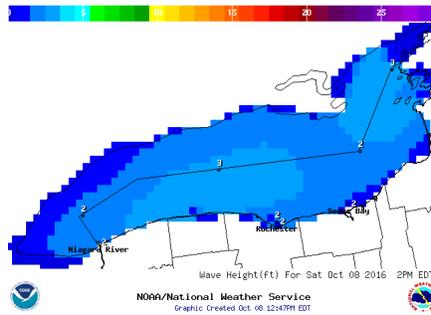
It allows you to view graphically: Wave Height, Wave Period, Wind Speed, Wind Gusts, Weather, or Temperature for any of the Great Lakes. It also allows a look ahead at forecasts for 5 days

Here are a few sample screen shots of the output.



The wind speed and direction is displayed for the Great Lake chosen. For those that have taken USPS Weather Course or are otherwise familiar with the NWS station model you will recognize this as 15 kts Westerly winds.

The corresponding wave heights for the above conditions are shown here.



You will note the Wave Ht varies significantly for different areas of the lake.

We have found this useful in trying to decide whether to proceed with a lake crossing or to stay in port another day or so to take advantage of improving conditions

Note: By inputting a Zip Code instead of selecting one of the Great Lakes this site will provide typical NOAA forecast info for any location.

*Don joined the Seneca Squadron in 1988. He has reached the grade of Advanced Pilot, has completed all of the squadron elective courses.*

*Don's interests are in education and has instructed the Weather course, Partner in Command and Emergencies Aboard seminars. He has been a certified Vessel Examiner since 2001.*

*Don & his wife Marge boat primarily on Seneca Lake and Sampson State Park is home port for them and their boat BACCHUS. They enjoy cruising and their cruises include the NYS Canal System from Lake Champlain to Buffalo, Lake Ontario, the Rideau Canal system to Ottawa, the Trent – Severn canal system to Georgian Bay on Lake Huron, St. Lawrence Seaway to Montreal, the Richelieu Canal to Lake Champlain. Don has also served as navigator for a yacht delivery from the Chesapeake Bay to Long Island Sound.*

## Leap Seconds: More Than You Ever Wanted To Know

*Excerpts from a paper by the U.S. Department of Homeland Security, with the United States Naval Observatory and Others.*

The decision to add a leap second is made by the International Earth Rotation and Reference Systems Service, an international standards body, to accommodate for variations in the Earth's rotational speed. The U.S. federal government's Global Positioning System (GPS) broadcasts leap second correction information in the navigation message. However, it is the responsibility of users to assure that their hardware and software recognizes and manages the leap second correctly; errors and equipment failures can occur when GPS receivers and clocks process the leap second signal incorrectly. Please ensure all software and firmware is up to date.

### Leap Second Introduction

The Coordinated Universal Time (UTC) time standard, based on atomic clocks, is widely used for international timekeeping. UTC is the basis of legal

time for most of the world, including the United States. For the Department of Defense (DoD), UTC (USNO), UTC as realized by the U.S. Naval Observatory (USNO), is the standard for all DoD systems/operations. UTC (NIST), UTC as realized by the National Institute of Standards and Technology (NIST), is official time for civilian use. The two time scales are equivalent to within 50 nanoseconds, and for many applications either may be used.

UTC must be adjusted at irregular intervals to keep it close to mean solar time, due to irregularities in Earth's rotation. These adjustments, called leap seconds, are pre-determined. The next leap second will occur on 31 December 2016 at 23:59:59 UTC.

Specifically, a positive leap second will be inserted between second 23:59:59 UTC of 31 December and

second 00:00:00 UTC of 1 January 2017. This extra second is displayed on UTC clocks as 23:59:60.

UTC is the official term for the time maintained cooperatively by many countries, using atomic clocks. The term is often used colloquially to refer to time scales based on the time zone of the prime meridian, zero longitude (e.g., military time, Zulu time, Greenwich Mean Time (GMT)). (Time scales based on astronomy [e.g., mean solar time] will differ slightly from UTC.) Local time zone offsets apply as needed. For example, the 31 December 2016 leap second will occur at 6:59:59 PM Eastern Standard Time on the East coast of the United States and 3:59:59 PM Pacific Standard Time on the West coast of the United States.

NOTE: Systems that do not receive time via an external reference may

require manual resetting or synchronization to maintain consistency with UTC.

For more information on Leap Seconds, please see the background following the best practices.

## Leap Second Implementation

The Leap Second occurs simultaneously worldwide based on UTC day transition 31 December/1 January, irrespective of your local time zone.

To implement the positive leap second, all UTC clocks will display an extra second. The date sequence of the UTC markers will be:

31 Dec 2016 23H 59M 59S  
31 Dec 2016 23H 59M 60S \* (extra second)

Followed by:  
01 Jan 2017 00H 00M 00S

Note: If your clock is set to local time zones, then the above example will need to be adjusted to your local time zone.

Time on NTP clients and Stratum 2 servers should be verified after the leap second insertion. Systems receiving time over NTP may have delayed responses to the leap second update depending on the software version installed.

NOTE: Not all clocks implement leap seconds in the same manner as UTC above. Some may use multiple 59s or 00s verses the 60s scheme above or even just freeze the time for one second.

## Leap Second and Global Positioning System (GPS)

GPS receivers should be unaffected by the addition of a leap second. Those built in accordance with IS-GPS-200H should adjust for this leap second change without user intervention. However, systems that use embedded GPS receivers as time references must be designed to accommodate the occurrence of leap seconds.

Leap seconds should not affect the use of GPS for navigation. Location is computed using GPS System Time, a time scale that is referenced to UTC as it was in 1980, without subsequent leap seconds. Only the conversion of GPS System Time to the conventional UTC time scale is affected by leap seconds.

The GPS signal provides advanced notice to the receiver that a leap second will occur. To receive this message, ensure that a GPS receiver has been turned on at least once since 19 July 2016, and prior to 2359 on 31 December 2016, for at least 30 minutes—the cycle time of the suite of messages. This will ensure that the latest almanac is downloaded, which will contain the leap second notification information.

## Leap Second and Network Time Protocol (NTP)

Care should be taken with NTP. Network managers should verify their networks are utilizing a traceable NTP source. These include the NTP servers provided by NIST (see <http://tf.nist.gov/tf-cgi/servers.cgi>) and the USNO, at:

ntp.usno.navy.mil  
IP: 192.5.41.40  
Location: Washington, DC

ntp.usnogps.navy.mil  
IP: 204.34.198.40  
Location: Colorado Springs, CO

These NTP servers will correctly implement leap seconds.

NTP data packets may include a leap second flag, which informs the user client software that a leap second is imminent. This allows the user client software to automatically adjust for leap seconds.

Certain computer systems are not designed to handle the existence of leap seconds—that is, other than 86,400 seconds in a day. When leap seconds occur, they handle them in various ad hoc ways. Some IT providers plan to spread the extra second out over many hours before or after the actual leap second. Others

duplicate the time stamp of 23:59:59 or 00:00:00 over two seconds. Others ignore the leap second and resynchronize to UTC at some later time. NTP servers hosted on such computer systems may disseminate inaccurate data that follow from these ad hoc approaches. These data include both the time and the leap second flag. The time may be in error for up to a day after leap second insertion.

Users with computer systems that rely on NTP to obtain or disseminate the correct time to better than one second should take two steps. First, ensure that your NTP software is up to date. (See, e.g., <http://www.ntp.org/downloads.html>) Second, ask the operators of any NTP servers that you use how their systems handle leap seconds. Verify that their solution will meet your requirements.

NTP software updates should be checked on a recurring basis. The most current NTP software updates are located at <http://www.ntp.org/downloads.html> in accordance with service network policy. Some vendors integrate NTP updates into their comprehensive software updates. Other useful archived information can be found at <http://www.ntp.org/>.

## Leap Second History

UTC uses the International System (SI) definition of the second, based on atomic clocks.

### Definition of a Second

In 1967 the General Conference on Weights and Measures (CGPM) defined the length of the second to be based on the atomic clock as follows: The second is the duration of 9,192,631,770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the cesium 133 atom. This defines the SI second.

### Definition of a Leap Second

A leap second is a one second adjustment that is applied to **Coordinated Universal Time (UTC)** in order to keep its time of day close to the **mean solar time standard**

(UT1). UT1 is based on precise measurement of the Earth's rotation.

### *Determination of Leap Second Insertion*

Insertion of each UTC leap second is usually decided several months in advance (in this case it was in July 2016) by the International Earth Rotation and Reference Systems Service (IERS), when needed to ensure that the difference between the UTC and UT1 readings will remain within  $\pm 0.9$  second.

**International Atomic Time (TAI)** is the uniform time scale based on the atomic clock; its unit interval is defined by the SI second.

**Coordinated Universal Time (UTC)** is derived from TAI, to provide a reference scale in step with the irregular rotation of the Earth. The timing standard for the DoD, UTC (USNO), is maintained at the US

Naval Observatory (USNO). Official time for civilian use is maintained at the National Institute of Standards and Technology (NIST), providing UTC (NIST).

Meteorological, geological, and astronomical phenomena affect Earth's irregular rotation speed. This irregular motion of Earth's rotation rate is accounted for by the introduction of "leap seconds." Without such a correction, UT1 drifts away from UTC. Leap seconds are irregularly spaced and unpredictable. In fact, it is possible that leap seconds may be either positive or negative, but so far, all leap seconds have been positive.

In 1972, the present definition of timekeeping was adopted that include the insertion of a leap second so that the broadcast UTC seconds could be made exactly equal to the standard SI second, while still allowing the UTC time of day and changes of UTC date

to be synchronized with those of UT1. By then, the UTC clock was already 10 seconds behind TAI, which had been synchronized with UT1 in 1958, but had been counting true SI seconds since then.

After 1972, both clocks have been ticking in SI seconds, so the difference between their readouts at any time is 10 seconds plus the total number of leap seconds that have been applied to UTC (36 seconds as of July 2015). The most recent leap second was added on June 30, 2015 at 23:59:59 UTC. A leap second will again be inserted at the end of 31 December 2016 at 23:59:59 UTC.

o o o o o

*The full contents of this paper can be found at the US Coast Guard's Navigation Center web site:*

<http://tinyurl.com/zloqjtz>

## The Last Word

*By Tom Alley, SN*



I believe it was Charles Dickens who penned, "It was the best of times, it was the worst of times," in the opening paragraph of his classic

work, *Tale of Two Cities*. In retrospect, those words seem appropriate when describing the boating season just experienced by the Master and crew of *Tomfoolery*.

On the one hand, it was a fantastic summer with good sailing weather. The vessel and crew experienced the New York Canals, Lake Ontario, the St. Lawrence Seaway and the Thousand Islands. We had some really good meals aboard along with great camaraderie as we cruised to new and exciting destinations in the company of *SV Seek Ye I<sup>st</sup>* and her crew.

At the same time, we had challenges that, while not approaching those of biblical proportions experienced by the prophet Job, certainly caused the ship's Master to contemplate sanity of owning a boat in the first place:

- The water heater malfunctioned on the eve of the Ontario cruise.
- The toilet sprang a wonderfully aromatic leak during while touring Lake Ontario.
- Then there was the dramatic failure of the forestay which completely trashed the furler and foresail.
- The very day the furler and forestay were repaired the 2-year-old diesel motor seized up.
- Then the simultaneous failure of not one, but both bilge pumps.
- And just to add insult to all of this, those stupid spreader lights stopped working again!

In fact, my crew started a list of things that broke this summer and it was depressingly long (17 items and

counting). This included a pair of discs in my back that I re-injured while moving diesel motors into and out of my boat.

Perhaps this is why sailors are stereotyped as frequently imbibing intoxicating beverages? Brings to mind the lyrics of a U2 song:

*I tried to drown my sorrows.  
But my sorrows,  
they learned to swim.*

Well, no one ever said sailing would be easy! And to be honest, I don't know that I would want it any other way. It forces you to learn, to adapt, to be patient, to persevere, and to savor the things that go well.

Most of all, I think these trials and tests teach you to thoroughly appreciate and enjoy the company of those who are sailing through this life with you. (Especially the ones that stand by you as you inspect a thoroughly mangled piece of

equipment and softly state, “Yup. It’s toast,” and hand you a cold beer.)

o o o o o

Yes, it is the best of times. Period.

As always, send your thoughts about this newsletter to:

- Tom

[editor@SenecaPowerSquadron.US](mailto:editor@SenecaPowerSquadron.US).

## Calendar of Events

### November 2016

- 1 Seneca *Drum* November issue publication.
- 1 *The Deep 6* fall issue publication date.
- 4-6 District 6 Fall Council & Conference  
*Holiday Inn, Binghamton, NY*
- 7 Year-End Squadron Dinner Meeting  
*Speaker: Jeff Freedman, Syracuse Squadron*  
*Tag's Restaurant*
- 20 Last day of operation for the New York Canals.

### December 2016

- 19 Deadline for Drum Articles

### January 2017

- 1 Seneca *Drum* January issue publication.
- 15 Deadline for D/6 *The Deep 6* articles.
- 15 Change of Watch (1300)  
*Holiday Inn, Water St., Elmira, NY*
- 17 Bridge Meeting (1900)  
*Location TBD*

### February 2017

- 1 *The Deep 6* winter issue publication date.
- TBA USPS Annual Meeting  
*Orlando, FL*
- 21 Bridge Meeting (1900)
- 21 Deadline for Drum Articles

### March 2017

- 1 Seneca *Drum* March issue publication.
- 21 Bridge Meeting (1900)

### April 2017

- TBA Junior Sailing 2017 Organizational Meeting
- 15 Deadline for D/6 *The Deep 6* articles.
- 18 Bridge Meeting (1900)
- 21 Deadline for Drum Articles

### May 2017

- 1 Seneca *Drum* May issue publication.
- 1 *The Deep 6* spring issue publication date.
- 16 Bridge Meeting (1900)
- TBA Safe Boating Week
- 22 Deadline for Drum Articles
- 27 Junior Sailing Organizational/Kick-Off Meeting

### June 2017

- TBA Junior Sailing regular sessions begin.
- 20 Bridge Meeting (1900)
- 26 Deadline for Drum Articles

### July 2017

- 1 Seneca *Drum* July issue publication.
- 15 Deadline for D/6 *The Deep 6* articles.
- 18 Bridge Meeting (1900)
- TBD D/6 2017 Rendezvous

### August 2017

- 1 *The Deep 6* summer issue publication date.
- 15 Bridge Meeting (1900)
- 21 Deadline for Drum Articles

### September 2017

- 1 Seneca *Drum* September issue publication.
- 19 Bridge Meeting (1900)

### October 2017

- 17 Bridge Meeting (1900)
- 23 Deadline for Drum Articles

*Calendars are “living documents.” For the latest information on squadron activities, please check our web site:*

<http://www.SenecaPowerSquadron.US>

*or our Facebook page:*

<http://facebook.com/SenecaPowerSquadron>

*for any last-minute changes.*