

# NAPS News

Northumberland Association for Progressive Stewardship  
"Northumberland is going to grow. Let's help it grow with order and beauty."

Winter 2015

Volume 24, Issue 1



## Welcome to the Winter Issue of NAPS News.

This is a very special issue, featuring what you need to know about participating in and enjoying the NAPS Earth Day Celebration produced in conjunction with the Northumberland Family YMCA, Rice's Hotel / Hughlett's Tavern, and the Northumberland Public Library. It all starts Saturday, April 18, at the Heathsville Farmers Market.

### Here's what's inside the NAPS Earth Day Special Report:

**Attention Runners and Walkers.** 5K Race/Walk Director Bill Kirby sets the stage for the run. So, ready, set, go!

**The Celebration.** The NAPS Earth Day Celebration promises to be an exciting day for adults and children of all ages. Get your program here!

**YMCA Trains 5K Wannabes, Sets up Youth Runs.** At this writing, the "wannabes" are in training and the kids are getting excited about their events. Go Y!

**Farmers Market Will Also Celebrate.** In addition to providing the Earth Day Celebration venue, the Heathsville Farmers Market will have a full line up of activities, including the 9th Annual Northern Neck Wine Fest. Drink up!

**Library Joins Festivities.** Authors and environmental book sales are on offer with Ye Olde Book Shoppe as a central attraction. Inform, educate, and entertain!

**Okay. Sign up.** Ready to go? Here's the Information & Registration Form that you will need. Hit the road!

**After the 18th.** On Monday, April 20, NAPS is sponsoring two reviews, one for school kids and another for adults, by Stephen Nash of his book, "Virginia Climate Fever." Read on!

**Finally, on Earth Day...** On the actual date, April 22, NAPS holds its highway clean-up along Route 200 from Wicomico Church. Take out the trash!



### Other news this winter:

**Going Solar in the Northern Neck.** At the Annual Meeting, February 7, NAPS presented "Residential Solar Power in the Northern Neck" to an attentive and active audience. As for the Business Meeting, see the Officers and Board Members panel for the current lineup.

**New STEM Brochure on the Way.** With the Gateway to STEM room open at the high school, the brochure explaining STEM'S importance is in preparation.

**Robots are (Almost) Here.** Lee Allain reports that the pieces are coming into place.

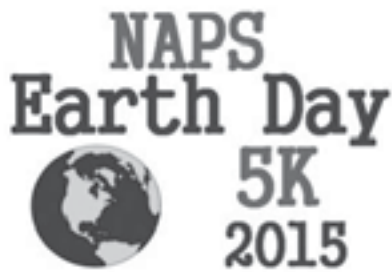
**A Melting Arctic and Weird Weather.** In this CCL Update, Dr. Greg Haugan discusses the puzzles that the weather this winter have created for climate change scientists.

**NAPS Financial/Member reports.** Treasurer Greg Haugan spells out where we stand.

**This is no time for NAPS to nap.**

*To keep up with NAPS on a regular basis, check out our web site: [www.napsva.org](http://www.napsva.org). 5K Race info is there.*

*Jay Walker, Editor (Note: The Walkers in the first item, does not include us!)*



## The NAPS Earth Day Program

By Dr. Greg Haugan

The NAPS Earth Day Celebration and 5K Race promises to be an exciting day for adults and children of all ages. It is being held in conjunction with the first Heathsville Farmers Market of the year. There are activities planned as well as many relevant exhibits and activities not only on Saturday April 18 but on other days as well. Following is some of what is currently planned and underway.

**April 1-30** .....NAPS Exhibit in Library Vestibule

**Friday April 17**

9 am – 5 pm .....Ye Olde Book Shoppe special sale on environmental books

**Saturday April 18**

6:30 – 7:30 am ....Final Registration and Check-in for the 5K Race

8:00 am .....Start of the 5K Race

8:30 am .....Food and drinks available for Race Entrants @ Start/Finish line

9:00 am .....Farmers Market Opens – 40 – 50 vendors, including food vendors

9:00 am .....Earth Day Exhibitors Open (See below)

9:00 am .....Tavern Quilt Show Exhibit and sales in Transportation Building

9:00 am .....Bandstand: Blues Society band program starts

9.15 am .....Tot Trot Starts – race for age 4 and under

9:30 am .....1K YMCA Healthy Kids Run Start

9:30 am .....Bandstand: Awards Ceremony 5K Race

10.00 am .....Ye Olde Book Shoppe opens featuring sale on environmental books

10:30 am .....Kids Earth Day Treasure Hunt (RH-HT)

11:00 pm .....Wine Fest and Food Court opens

12:00 Noon .....Blues Society band provides final set

12:00 Noon .....Bandstand: Middle School Chorus (tentative)

1:00 pm .....Farmers Market ends (Vendors may stay later)

5:00 pm .....Wine Fest ends

**Monday April 20**

11:00 am .....Author Steve Nash at Northumberland High School discussing *Virginia Climate Fever* (Sponsored by NAPS)

7:00 pm .....Author Steve Nash at Meeting Room of the Heathsville United Methodist Church discussing *Virginia Climate Fever* and signing books. (Special 20% discount) (Sponsored by NAPS)

**Wednesday April 22 Earth Day**

10.00 am .....NAPS Semi-Annual Trash Pickup, Janice Mahoney plus volunteers, Wicomico Church staging area.

## Attention Runners and Walkers

By Bill Kirby

What better way to start your Earth Day Celebration NAPS members than with a brisk walk or an exhilarating run in the NAPS Earth Day 5K? The race starts at 8:00 a.m. in front of the Northumberland Historical Society, wends its way along Back Street, across US 360, and meanders down Spring Road for about 1.5 miles, and then returns along the same route. Water will be available at the Mill Pond. The race is walker, dog (on leashes) and stroller friendly, so enter the entire family for a healthy Earth Day outing!

Following the race all participants will be treated to a healthy breakfast before the Farmers Market and Earth Day Celebration gets underway with live music by the Blues Society. A Tot Trot for kids under 4 will begin at 9:15 with free prizes for all kids. The YMCA Healthy Kids Run, for kids 4 to 10 will take place at 9:30. An awards ceremony for overall and age group winners will take place at 10:00. (See program.)

The \$25.00 race entry fee helps NAPS with the costs of the Earth Day Celebration, supports the NAPS Scholarship Fund and the Northumberland Public Library. **The first 200 registrants receive a specially designed race cap and water bottle.** Go to [napsva.org](http://napsva.org) for registration information (see form.). Or register on-line through [raceit.com](http://raceit.com).

As the event approaches, planning for the Earth Day 5K is moving into high gear with the help of a dedicated Race Committee. Many thanks to Greg Haugan, Bill Estell, Joe Thompson, Denise Schindler, Dale Witler, Brian Buffaloe, Amy Jones, Ellen Kirby and Leslie Garland for being there every step of the way! The course has been measured, a marketing plan put into effect, race supplies and awards ordered, and good weather has been conjured. Ready, set, go!

*Note: Bill Kirby is President of the NAPS Earth Day 5K Race Committee.*



**April 18 Earth Day Exhibitors currently include the following:**

NAPS – double booth

Omega Protein – double booth

Citizens Climate Lobby

U.S. Fish and Wildlife Service (Rappahannock Wildlife Refuge Friends Group)

U.S. Army Corps of Engineers

Shoreline Evaluation Program (Northern Neck Master Gardeners)

Friends of the Rappahannock

Master Gardeners – two booths (Master Gardeners and Shore Line Program)

Northern Neck Master Naturalists

Northern Neck Soil and Water Conservation District

Native Plant Society

Northumberland County Elementary School – Recycling (tentative)

Virginia Marine Resources Commission (tentative)

Beekeepers Society (tentative)

Wetlands Project (tentative)

Northern Neck Land Conservancy (tentative)

Tidewater Oyster Growers Association (TOGA) (tentative)

## YMCA Trains 5K Wannabes, Sets up Youth Runs

By Cristian Shirilla

Under the theme, "You Can Run a 5K Too," the Northumberland Family YMCA in Heathsville, has invited first-time participants age 18 and up to join a training program, called "Couch to 5K." The goal is to be physically fit to enter the NAPS Earth Day 5K, on April 18 at the Heathsville Farmers Market.

Classes consist of weekly meetings on Saturdays from 8 to 9 a.m. Because of the snow and cold, February 21 start day was postponed to February 28. There are five participants. Activities include group run/walk, nutrition tips, pre-run stretching, and physical fitness. These activities are part of a program designed specifically for first time distance runners. Terri Bunch, the Y trainer, leads the group along with volunteer Lesley Garland. Both are experienced runners. On the February 28 snowy day, the training moved in-doors, but the main focus is running outside.

The program costs \$15 for Y members and \$30 for non-members. Participants receive \$5 off the Earth Day 5K registration fee. They can register for the 5K event at the Y, as well.

At the conclusion of the program, participants are physically prepared to complete their first race.

The Y has also set up Earth Day races for youngsters. They include the NAPS Earth Day 5K for ages 10+, the YMCA Healthy Kids 1K Fun Run for ages 4 – 10 and the Tot Trot for ages 4 and under. We have lots of interest in the Healthy Kids 1K Fun Run and expect registrations to take off as soon as winter finally retreats for the year. Race information and registration packets are available at the Y.

*Note: Cristian Shirilla is Branch Executive Director of the Northumberland Family YMCA in Heathsville.*



*Terri Bunch, the YMCA trainer (left), will lead the "Couch to 5K" program specifically designed for preparing first-time participants for distance running. She is pictured with Branch Executive Director Cristian Shirilla.*

## Library Joins Festivities with Authors and Sales

By Bryna Brennen

The Northumberland Public Library will take part in the NAPS Earth Day celebration by hosting two authors, setting up exhibits and featuring environmental books at Ye Old Book Shoppe in Heathsville.



*Author Ivor van Heerden*

share his views about his book. A native of South Africa, he has been involved in natural disaster research projects in various parts of the world and played a key part in the dissemination of information on the impacts of Hurricane Katrina.

After warning for years about the looming threat of catastrophic flooding in New Orleans, Dr. van Heerden gained prominence by challenging the official versions of the events surrounding the hurricane and campaigned for an engineering plan that would protect all of southeastern Louisiana.

Also joining the celebration will be Northern Neck resident Catherine Bennett, who has been beekeeping for more than 15 years with her husband Robert at Melrose, an antebellum plantation near the Chesapeake Bay. As a founding member of the Northern Neck Beekeepers Club

The library table that will set up at the event will include environmental tips for adults and children as well as books by local author Catherine Bennett and nationally recognized writer Ivor van Heerden. Both authors will be available to discuss and sign their works.

Dr. van Heerden, author of *The Storm – What went wrong and why during Hurricane Katrina – the inside story from one Louisiana scientist*, will

and former president of The Rappahannock Garden Club of White Stone, Ms. Bennett said she "wrote this book to inspire others to know more about honeybees and ways we can help them, and in turn help ourselves, survive."

Ms. Bennett's *Honeybees & Recipes* provides recipes not only for cooking with honey, but also for other uses of bee products in beauty, health and around the home. It includes ways to stay safe around honeybees and ways to treat stings.

The library will host several exhibits leading up to and during the April 18 event. And the popular second-hand bookstore located just down the street, Ye Olde Book Shoppe, will offer special sales on environmental books. The book store also will provide free coffee and water, as well as a place to sit for a while.

*Note: Bryna Brennen is a member of the Northumberland Library Board of Trustees.*

### Adopt-A-Highway Clean-Up

*On the actual Earth Day date, Wednesday, April 22, NAPS will have its spring Adopt-A-Highway clean-up coordinated tirelessly by Janice Mahoney. As usual, volunteers are asked to meet at the parking lot behind the Wicomico Church on Route 200 in Wicomico Church at a new time, 10 a.m.*

*Volunteers will wear Earth Day t-shirts under the bright orange safety vests. The clean-up covers Route 200. And, as Janice points out, the more volunteers, the faster the job gets done. In short, she's looking for some new blood. To join up, please call Janice at 580-3154 or email to [vervaville@yahoo.com](mailto:vervaville@yahoo.com).*



# Farmers Market Will Celebrate Wine, Quilts and Heritage Arts

By Corinne Becker

Yes, Saturday, April 18th is going to be a big day at Rice's Hotel/Hughlett's Tavern for the Heathsville Farmers Market, which runs from 9 a.m. to 1 p.m. At this season-opener, the Market is pleased to be partnering with NAPS to provide a venue for the NAPS Earth Day Celebration.

But attendees will find even more here on April 18th. The Tavern Quilt Guild's annual Quilt Show and Sale will be open inside the Tavern's Transportation Museum Building. Then from 11 a.m. to 5 p.m., the 9th Annual Northern Neck Wine Fest will take place in a secured area behind the Tavern building. Tickets -- \$15 per person -- will be sold at the entrance. As usual, each ticket-holder receives a commemorative wine glass.

In addition, the day will feature the grand opening of the Tavern's "Heritage Arts Center." Located inside the historic Tavern, the center includes working artist studio space, gallery, and an expanded shop selling locally-crafted artisan wares.

The Tavern's four active artisan groups, in addition to the Quilt Guild, will be on hand working and selling their wares. These include the Blacksmith Guild in the Tavern's forge, the Spinners and Weavers Guild in their studio on the second floor of the Tavern, and the Woodworkers Guild in their colonial era workshop at the Carriage House.

Shoppers at the Farmers Market will find a variety of vendors selling fresh Northern Neck produce, baked goods, nursery plants, heritage breed pork, local honey, organic beef, oyster floats and spat, and locally-made handcrafts.

For more information about all the activities at Rice's Hotel/Hughlett's Tavern, visit [www.rhhtfoundation.org](http://www.rhhtfoundation.org) or email [info@rhhtfoundation.org](mailto:info@rhhtfoundation.org).

Note: Corinne Becker is Executive Director of Rice's Hotel/Hughlett's Tavern.



Scenes from the Heathsville Farmers Market and the Annual Northern Neck Wine Fest.



Environmental journalist Stephen Nash

## Book Review: Climate Change in Virginia

By Dr. Greg Haugan

As part of the Earth Day Celebration, NAPS is sponsoring a review of *Virginia Climate Fever* by author Steve Nash. Reviews will be held on Monday, April 20, at Northumberland High School beginning at 11 a.m. and for adults at the United Methodist Church in Heathsville, starting at 7 p.m.

Climate disruption is often discussed on a global scale, affording many a degree of detachment from what is happening in their own backyards. In *Virginia Climate Fever*, environmental journalist Stephen Nash brings home the threat of climate change to the state of Virginia. Weaving together a

mix of data and conversations with both respected scientists and Virginians most immediately at risk from global warming, the author details how Virginia's climate has already begun to change.

In layman's terms, Nash argues that alteration in the environment will effect not only the cities, but also hundreds of square miles of urban and natural coastal areas, the 60 percent of the state that is forested, the Chesapeake Bay, and the Atlantic coast. The narrative offers striking descriptions of the vulnerabilities of the state's many beautiful natural areas, around which much of its tourism industry is built.

While remaining respectful of the controversy around global warming, Nash allows the research to speak for itself. In doing so, he offers a practical approach to and urgent warning about the impending impact of climate change in Virginia.

## 5K Race Entry Form

### REGISTRATION FEE

Adult \$25.00 (\$30 after April 10)

Youth, 12 & under, \$10.00 (\$12 after April 30)

No charge for 100 Yard Tot Trot, limited to kids under 4

Mail Entry Form and make Checks payable to: NAPS Earth Day 5K, P.O. Box 567, Heathsville, VA 22473 or enter online at [www.napsva.org](http://www.napsva.org)

**WAIVER:** Running a road race is potentially hazardous activity, which could cause injury or death. I will not participate unless I am medically able and properly trained. By my signature, I certify that I am medically able to perform this event, am in good health, and I am properly trained. I agree to abide by any decision of a race official relative to any aspect of my participation in this event, including the right of any official to deny or suspend my participation for any reason whatsoever. I attest that I have read the rules of the race and agree to abide by them. I assume all risks associated with running in this event, including but not limited to: falls, contact with other participants, the effects of the weather, traffic and the conditions

NAME: \_\_\_\_\_

AGE: \_\_\_\_\_ SEX: \_\_\_\_\_

PHONE: \_\_\_\_\_

Email: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP \_\_\_\_\_

Check one: Adult: \_\_\_\_\_ (\$25.00) Youth \_\_\_\_\_ (\$10.00)

of the road, all such risks being known and appreciated by me. Having read this waiver and knowing these facts and inconsideration of your accepting my entry, I, for myself and anyone entitled to act on my behalf, waive and release the NAPS Earth Day 5K and the Road Runners Club of America, all event sponsors, their representatives and successors from all claims or liabilities of any kind arising out of my participation in this event, even though that liability may arise out of negligence or carelessness on the part of the persons named in this waiver.

Signature (Parent's Signature If under 18)

Date

NEWS

# Going Solar in the Northern Neck

By Jay Walker

Under the title, "Residential Solar Power in the Northern Neck," NAPS presented a program geared to inform homeowners of the basic language, construction considerations, and benefits of going solar at the Annual Meeting, Saturday, February 7. Attendance was 61 members and non-members of NAPS.

To get an orientation, Vice-President Lee Allain began the program with a review of the "language of solar and some basics." He pointed out that it costs 12 cents to light a 100 Watt light bulb for 10 hours, run a 1,000 Watt heater for an hour, or to travel three miles with an electric vehicle.

He said the sun works about the same number of hours that we do – 1,825 to 2,190 hours a year. Lee described the components of a typical solar system, using a demonstration configuration that NAPS acquired for the Northumberland High School. This system consists of photovoltaic solar cells, charge converter, inverter, and batteries (at an extra cost). A 5 KW array at \$4/Watt costs \$20,000 (\$14,000 after the \$6,000 tax break currently available) and has a life expectancy of 20 to 25 years. Payback, he estimated, is about 10 years with no increase in rates that utilities are certain to impose.

Two speakers made the solar experts presentations in a panel discussion chaired by Dr. Greg Haugan. It became clear that a solar energy industry is up and running in Virginia. At present, most of the construction is for commercial companies, they stated, but residential is a fast-growing slice of the pie. Both companies were created as solar divisions of established contractors. But the solar divisions had to hire an array of experts and a substantial work force in order to install a range of configurations to fit the needs and pocketbooks of their clients. Both speakers emphasized that homeowners should find out the level of expertise of the solar contractor, because the business requires sophisticated designers.



The NAPS solar energy panel included from left, Dr. Greg Haugan, moderator; Nick Messar, Prospect Solar; and Sean Ingles, Integrated Power Sources of Virginia.

Nick Messar, representing Prospect Solar, reported that his company was formed in 2010 as a subsidiary of a roofing firm. The company now has a work force of about 400. He said that about 20 percent of the business is residential, but has been growing. Farms

are particularly important potential solar energy customers, he added. As a result, Prospect Solar now has a residential specialist on board.

Sean Ingles, representing Integrated Power Sources of Virginia, reported that his company became off-shoot of a crane

manufacturer in 2009. He predicted that commercial installations will double this year. Ingles stressed the need to have multiple designs to accommodate challenging requirements. For example, he described an energy security system that includes battery backup for grid type solar installations. Power Sources has added roofing

experts in order to deal with the various types of roofing materials. In another example, the company has installed solar panels on sun rooms. He predicted that in the future, solar panels will replace windows in houses.

A lively Q & A segment concluded the panel. Questions covered maintenance, wind damage resistance, cost of ground systems, post-installation up-grades, roofing considerations, and Virginia regulations regarding utility interface. Attendees continued discussions and picked up company literature after the formal meeting.

"I think this program demonstrated how much interest there is in solar energy here," said Haugan, adding that it was good to meet young, energetic, and practical managers from a young and growing industry.



## NAPS Calendar

NAPS Board Meetings are held on the second Wednesday of each month, starting at 9 a.m. at the Union First Market Bank on Rt. 360 in Burgess, unless otherwise changed.

- Apr. 8, Wed.....NAPS Board Meeting
- Apr. 18, Sat.....NAPS Earth Day Celebration, Heathsville Farmers Market
- May 13, Wed.....NAPS Board Meeting
- May 23, Sat. ....NAPS at St. Stephens Strawberry Festival, Heathsville
- June 10, Wed. ....NAPS Board Meeting
- July 8, Wed.....NAPS Board Meeting
- Aug. 12, Wed.....NAPS Board Meeting

EDUCATION

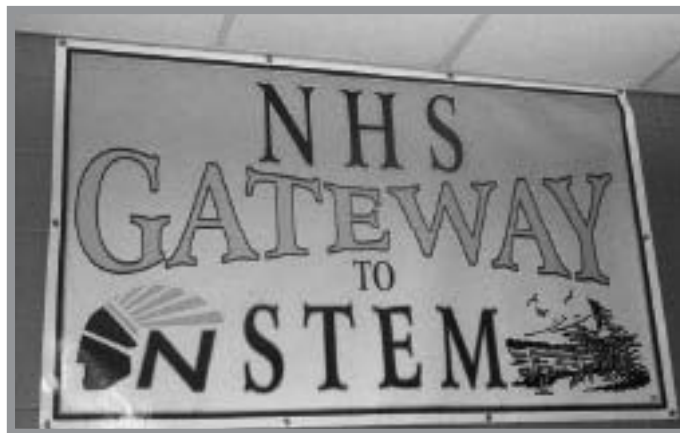
**New STEM brochure on the way**

By Lee Allain

One of the opportunities now open to our community has been provided at Northumberland High under the leadership of Dr. Burns, High School Principal.

Dr. Burns has set aside a room adjacent to the school library as the “NHS Gateway to STEM” complete with its own banner. This room has been dedicated as a resource to you and me – the Northumberland community – to foster conversations between students and local people with STEM (Science, Technology, Engineering and Math) careers “who have been there.” Northumberland is blessed with a tremendous retired base of technical talent. The issue is, as usual, how do we connect this resource to our young people. Most experienced Scientists, Technologists, Engineers, and Mathematicians in our community are willing to help.

To help move this potential mentorship along, a brochure has been generated that is intended to stimulate all of us toward helping students as they search for their niche in life. The brochure addresses the difference between jobs and careers. It stresses the importance of “aiming” at what you want to do in life. It summarizes what STEM is all about, and describes some of the possibilities of a technically oriented career. Lastly, it opens the opportunity to schedule some one-on-one time to chat about what technical careers might exist in the future and how to prepare for them. Meetings between students and “real STEM veterans” will be coordinated through the High School



Counseling Office. Copies of the brochure will soon be available from NAPS.

When NAPS calls you to spend some time with a student, or a student and his parents, we hope that you will enthusiastically join us in the NHS Gateway to STEM.

TECHNOLOGY

**Robots are (almost) Here**

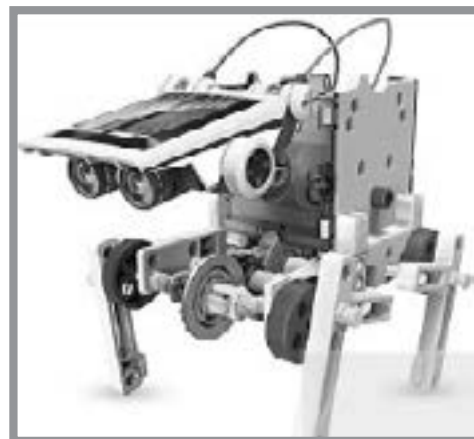
By Lee Allain

After working with Northumberland schools on Solar Panels, LEGOs, and Quadcopter Drones, NAPS has moved forward another notch this spring into the realm of Robotics. Yeah – STEM again.

As anybody with an iPhone knows, Siri, even today, can assist with scheduling your life, answering questions, and even providing location information.

An “embodiment” of Siri that provides physical help is not far behind. Robots unleashed to help will be the ultimate butler or - - - ? Unfortunately, the three laws posed by Asimov are not real laws.

1. A Robot may not injure a human being or, through inaction, allow a human being to come to harm.
2. A Robot must obey the orders given to it by human beings, except where such orders would conflict with the First Law.



3. A Robot must protect its own existence as long as such protection does not conflict with the First or Second Law.

The reality is that Robots can be unleashed to cause mischief or even make war.

Our sons and daughters *will see* a future with independent Robots, some indistinguishable from individuals, roaming our communities and the earth.

Our goal is to help students develop a strong Robotic knowledge base. That, coupled with a strong value system, will insure the intelligent evolution of Robotics technology as another step *forward* for mankind.

Under teacher guidance, NAPS has purchased a half dozen starter kit mini-robots for students to assemble and begin an understanding of their potential. Our intention, working with the school, is to move toward student involvement with more complex Robotics as soon as practical.

The physical embodiment of the Apple iPhone’s “Siri” is not far in our future.

**NAPS MEMBERSHIP REPORT  
MARCH 1, 2015**

The table below presents the current paid-up membership status. We have currently heard from 60% of our membership. We need the other 40% to enable us to continue our work to support Northumberland County in “growing in order and beauty.” We would also like our members to sign up for the NAPS Earth Day 5K Race and Walk, even if you can’t run it, you can walk it. Or you can sign up and simply sit it out. If you are one of the first 200 to sign up you will receive a nice looking race cap as is

Member Report	2015
Business	3
Family	36
Individual	23
Patron	24
Sustaining	20
Student	1
<b>Total*</b>	<b>85</b>

\*60% of 2014

shown elsewhere in this newsletter.

With your race bib you are also eligible to help yourself at the Race food table after 8:30 am on April 18.



## CCL UPDATE

**A Melting Arctic and Weird Weather**

By Dr. Greg Haugan

The last newsletter focused on several current issues and we shall continue in this issue, focusing on just two, however.

Everyone loves to talk about the weather, and this winter Mother Nature has served up a feast to chew on. Few parts of the U.S. have been spared her wrath.

Severe drought and abnormally warm conditions continue in the West, with the first-ever rain-free January in San Francisco; bitter cold hangs tough over the upper Midwest and Northeast; and New England is being buried by a seemingly endless string of snowy nor'easters.

Yes, droughts, cold and snowstorms have happened before, but the persistence of this pattern over North America is starting to raise eyebrows. Is climate change at work here?

**Wavier jet stream**

One thing we do know is that the polar jet stream – a fast river of wind up where jets fly that circumnavigates the northern hemisphere – has been doing some odd things in recent years.

Rather than circling in a relatively straight path, the jet stream has meandered more in north-south waves. In the West, it's been bulging northward, arguably since December 2013 – a pattern dubbed the "Ridiculously Resilient Ridge" by meteorologists. In the East, we've seen its southern-dipping counterpart, which is called the "Terribly Tenacious Trough."

These long-lived shifts from the polar jet stream's typical pattern have been responsible for some wicked weather this winter, with cold Arctic winds blasting everywhere from the Windy City to the Big Apple for weeks at a time.

We know that climate change is increasing the odds of extreme weather such as heat waves, droughts and unusually heavy precipitation events, but is it making these sticky jet-stream patterns more likely, too? Maybe.

**Slowing, drunken path**

The jet stream is a dastardly complex creature, and figuring out what makes it tick has challenged atmospheric scientists since it was discovered about 75 years ago. Even more elusive is figuring out how climate change will affect it.

Jet streams exist because of differences in air temperature. In the case of the polar jet stream, which is responsible for most of the weather we experience around the middle-latitudes of the northern hemisphere, it's the cold Arctic butting against warmer areas to the south that drives it. Anything

that affects that temperature difference will affect the jet stream.

This is where climate change comes in: the Arctic is warming much faster than elsewhere. That Arctic/mid-latitude temperature difference, consequently, is getting smaller. And the smaller differential in temperatures is causing the west-to-east winds in the jet to weaken.

Strong jets tend to blow straight west to east; weaker jets tend to wander more in a drunken north/south path, increasing the likelihood of wavy patterns like the one we've seen almost non-stop since last winter.

When the jet stream's waves grow larger, they tend to move eastward more slowly, which means the weather they generate also moves more slowly, creating more persistent weather patterns.

At least, that's the theory. Proving it is not easy because other changes are happening in the climate system simultaneously. Some are natural fluctuations, such as El Niño, and others are related to increasing greenhouse gases.

We do know, however, that the Arctic is changing in a wholesale way and at a pace that makes even Arctic scientists queasy. Take sea ice, for example. In only 30 years, its volume has declined by about 60%, which is causing ripple effects throughout the ocean, atmosphere, and ecosystem, both within the Arctic and beyond. Scientists never imagined they'd see the region change so much and so fast.

**'Stuck' weather patterns**

To study the effects of Arctic change on weather patterns, we have good measurements of atmospheric temperatures and winds going back to the late 1970s, when satellites started providing data, and pretty good measurements back to the late 1940s.

Scientists at Rutgers have been using this information to measure the waviness of the jet stream and whether it is behaving differently since the Arctic started its rapid warm-up about 20 years ago. Because the upper atmosphere is such a cacophony of swirling winds, however, measuring changes in the jet stream's waviness is tricky, as it's not a metric that scientists have traditionally used.

The challenge, then, was to find new methods to measure waviness and determine whether any changes found are related to rapid Arctic warming, to some other change in the climate system, or to just random chance. While the story is still in early days, the plot is thickening.

Several groups around the globe, including the Rutgers team, are trying to understand the linkages between rapid *(Continued on page 8...)*

**NAPS FINANCIAL REPORT - MARCH 1, 2015**

The total NAPS annual working budget is approximately \$6,000.00. Of that amount, \$2,500 is budgeted for five \$500 scholarships for deserving Northumberland High School graduating seniors. The remainder goes to other worthwhile activities such as eco-tours, supporting STEM activities at the public schools, and our mailings. To the right is a simple table of where we stand regarding the 2015 financial activities. As we can see from the Revenue line, we are running behind in our Budget. We have been fortunate in past years that Omega Protein has supported some of our activities, and responsible financial management has enabled us to have a financial carryover as shown in the starting balance. Omega has already donated funds to help cover some early 5K Race expenses. However, we expect our NAPS expenses to increase in March and early April. We expect to finance a short term deficit in the NAPS Earth Day 5K Race account during its negative cash flow period in March until receipts from the runner applications catch up. This "loan" will be repaid when the Race account cash flow turns positive. There is uncertainty in the net revenues from the Race and the timing of repayment since much depends on the weather and the number of participants and when they sign up. The scholarship recipients are identified in June and the awards at the High School Awards Ceremony a day prior to Graduation.

We have other financial resources such as funds set aside for matching endowment donations. The value of the Endowment is approximately \$11,000 which includes the starting amount of \$10,000 plus donations and matching amounts and the net changes in value of the investment account with Wells Fargo. We have received \$280.00 in Endowment contributions to date. We look forward to enhancing the contributions considerably with the proceeds from the NAPS Earth Day 5K Race discussed elsewhere in this newsletter.

**3/1/2015**

Starting Balance	\$5,944.06
Revenues	\$4,131.00
Expenses	\$1,242.60
Current Year Net	\$2,888.40
Operating Funds	\$8,832.46
<i>Submitted by: Gregory T. Haugan,</i>	
<i>Treasurer; March 1, 2015</i>	



## Melting Arctic and Weird Weather ...from page 7

Arctic warming and changes in weather patterns.

A number of recent studies have found what appears to be a solid connection between sea-ice loss in an area north of western Russia during the fall and a rash of abnormally cold winters in central Asia. The loss of sea ice favors a northward bulge in the jet stream, which strengthens surface high pressure to the east. That shift pumps cold Arctic air southward into central Asia.

Other studies suggest that Arctic warming in summer leads to a split jet stream – or two separated rivers of wind – which tends to trap the waves. Those stationary waves cause weather conditions to remain “stuck” for long periods, increasing the likelihood of extreme heat waves, droughts and flooding events in Eurasia and North America.

The work of Dr. Jennifer Francis of Rutgers University published last month in Environmental Research Letters uses a variety of new metrics to show that the jet stream is becoming wavier and that rapid Arctic warming is playing a role. If these results are confirmed, then we’ll see our weather patterns become more persistent.

In other words, Ridiculously Resilient Ridges and Terribly Tenacious Troughs may become the norm, along with the weather woes they cause.

*Extracted from an article by Dr. Jennifer Francis in The Conversation, Feb. 18, 2015, with permission, see <http://theconversation.com/a-melting-arctic-and-weird-weather-the-plot-thickens-37314>*

### The “Net-Zero” Concept

There is a growing consensus among the persons working on the draft of the new document to be reviewed at the Paris UN climate negotiations in December that within one generation the whole world will have to stop spewing CO<sub>2</sub> into the air from fossil fuel use. In short-hand, the new goal is “net-zero.” Some say it should be met as early as 2050 and others think a few more decades is more realistic.

It becomes a game of probabili-

ties, for example for a 66% likelihood of avoiding 2 degrees C of warming, considered the danger level, global greenhouse levels would have to be 40-70% below 2010 levels; CO<sub>2</sub> emissions alone from energy and industry would have to drop 35-80%. Overall emissions of all greenhouse gases would need to reach zero sometime between 2080 and 2100 but energy and industry emissions would have to reach zero by 2060 to 2075.

BP, in its annual forecast this week, said that it expects emissions of carbon dioxide to rise another 25 percent by the year 2035. That would certainly make it all but impossible to reach zero by 2050 and probably less than likely to get there by the end of the century — unless something changes. The BP forecasts are the industry standard.

One particularly powerful change, the big oil companies often say, would be the worldwide use of carbon pricing schemes, either through taxes or cap-and-trade regimes. We, of course in CCL are pushing putting a price on carbon and rebating the revenues to households. This would enable us to achieve “Net-Zero” on a timeline that would keep the world under the 2 degree C danger line.

We are currently on a path toward an at least 4 degrees C rise by the end of the century.

To provide an indication of how difficult the Net-Zero goal will be was

illustrated in a study presented in January 2015 that worked backwards from the 2 degree C goal or 450 ppm CO<sub>2</sub> in the atmosphere. It stated that 82% of the world’s coal reserves, one third of the oil reserves and half of the natural gas reserves must be left untouched. The study analyzed country by country. Needless to say the fossil fuel companies are resisting this. They spent \$670B in 2013 exploring for new oil and gas reserves.

*Partly extracted from “Is ‘Net-Zero’ Carbon Goal to Rescue the Climate Plausible?” by John Cushman, Jr. See: <http://insideclimatenews.org/news/20022015/net-zero-carbon-goal-rescue-climate-plausible>. Feb. 20, 2015*

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