

The Voter



A Publication of the League of Women Voters of Seattle-King County

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Ocean Acidification: It isn't Good News — and It's Coming to a Neighborhood Near You.

by R.A. Brown, Geophysicist, UW Atmospheric Science Professor emeritus

The League of Women Voters studies worldwide problems to help the public make decisions that make Democracy work. These include global warming, global sea level rise, ocean acidification, atmospheric pollution (particularly polluting energy), overpopulation, lack of inexpensive universal education, and skewed wealth distribution. What is the common thread for all these topics? What is most important? Do they affect you?

There is a large mixture of causes and effects. The major effects, global warming, **ocean acidification** and sea level rise, are often related to **climate change**. They share a common cause — atmospheric pollution in the form of increasing carbon dioxide from burning fossil fuel. These have the potential of being catastrophic for Homo sapiens.

The other topics deal mainly with causes. First there is overpopulation of our species. Second, there is the dichotomy in our politics that threatens our economy and our culture and exposes a fatal flaw in our democracy — the skewed wealth distribution — which makes it difficult to correct the pollution problem. This results in the third problem: the need for renewable energy to replace fossil fuel energy, which is a source of CO₂. Finally, there is the loss of the only successful remedy to these problems, inexpensive universal education.

My geophysics colleagues who are oceanographers have been telling me for some time that

it is the oceans where climate change is going to be seen first and foremost. Recent reports in science magazines and in a series of articles in the *Seattle Times* have focused on ocean acidification. There is evidence of its already serious appearance in the northwest waters of the Georgia Strait, Puget Sound, and the Strait of Juan de Fuca, collectively called the Salish Sea.

Thus the November 9th luncheon “hot” topic talk is “The Other Side of Carbon Emissions: Ocean Acidification and the Future of the Salish Sea.” It will be presented by Prof. Terrie Klinger, Barer Professor of Sustainability Science, UW School of Marine and Environmental Affairs and Co-Director of the UW Center on Ocean Acidification.

Professor Klinger is a member of the Washington State Ocean Acidification Blue Ribbon Panel, which was convened by Gov. Gregoire in February 2012. The panel summarized the current state of scientific knowledge of ocean acidification pertinent to Washington and produced a comprehensive set of recommendations. On November 27, 2012, in response to the panel's recommendations, Gov. Gregoire issued Executive

(continued on page 15)

Join Us!

Saturday, November 9

*The Other Side of Carbon Emissions:
Ocean Acidification and the Salish Sea*

Luncheon Fundraiser

Details on back cover

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Connecting with the Leadership

Fundraising: It seems like the very last thing I want to do is fundraising. I think I would rather do almost anything else, even cleaning the tub! I would much prefer to have a nice endowment and then we could spend our time doing what we do best – registering and educating voters, taking positions on issues, lobbying local and state officials, attending meetings of local governmental bodies and enriching our community through our outreach efforts. Speaking of community outreach and educating voters, we have been sending out speakers to various places to discuss the ballot issues; we have been assisting local communities to present candidate forums; we considered and took positions on local ballot measures - public financing of city council elections and the new office of public defense. [Please visit the advocacy page on our website for details.] In addition, we lobbied for public financing at the City Council; we joined the Coalition to End Gun Violence and have been obtaining signatures on the gun safety/background check initiative to the legislature.

All of these things have kept us so busy, it has been difficult to focus on our fall fundraising event. Yes, I knew you were wondering when I was going to get to that. As you know, we are all volunteers, except our administrative director, Allison Feher, who provides invaluable assistance to the Board. We all have to squeeze in our League tasks amongst all our other activities, job, kids, spouse, chores, etc. Even so, we need to raise money to continue to provide the benefits to our community that I described above. We have abandoned the annual auction since there is no longer anyone who wishes to invest the time or the energy it takes to produce that event. We instead are doing a series of “Hot Topic Luncheons” during which we present a



speaker on a topic that the membership said was important and is also (we hope) interesting to our community.

This November the luncheon topic is ocean acidification. Many of you may have read the recent *Seattle Times* series “Sea Change” - if not, you can read it online. We chose this topic because it is not only timely, but also of particular concern to those of us who live near the ocean, play in or on the ocean, consume seafood, or are simply concerned about climate change and its myriad effects on our planet.

We have asked Dr. Terrie Klinger, Barer Professor of Sustainability Science at the UW School of Marine and Environmental Affairs and Co-Director of the UW Center on Ocean Acidification, to be our keynote speaker. We believe that Dr. Klinger’s presentation will be

both educational and entertaining.

While it is important that each and every one of you attend this very interesting and topical event, it would be outstanding if each of you invited a friend or two who may not yet be a member of League. These events are an excellent way to introduce people to League. We will have mimosas, time to mingle/chat and a nice lunch during our program.

Ellen Barton
President

November

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2 Board Meeting 9:00 a.m.
3	4 Int'l Relations Committee 12:45 p.m. Voter Deadline	5 Election Day	6	7	8	9 Hot Topic Luncheon 11:30 a.m.
10	11	12	13	14	15	16
17	18	19 Transportation Committee 10:00 a.m.	20	21	22	23
24	25	26	27	28	29	30 Economics & Tax Cmte. 9:30 a.m.
December 1	2	3	4	5 Education Committee 10:00 a.m.	6	7

Units meet during shaded period

NOVEMBER

Board Meeting
Saturday, November 2
9:00 a.m.
League Office

International Relations
Committee
Monday, November 4
12:45-2:45 p.m.
League Office

The Voter Deadline
Monday, November 4

Election Day
Tuesday, November 5

Hot Topic Luncheon
The Other Side of Carbon
Emissions...
Saturday, November 9
11:30 a.m. - 1:30 p.m.
Town Hall Seattle

Transportation Committee
Tuesday, November 19
10:00 a.m.
League Office

Economics & Taxation
Committee
Saturday, November 30
9:30 a.m.
909 E. Newton, # D-9, Seattle

DECEMBER

Education Committee
Thursday, December 5
10:00 a.m.
League Office

Forum Schedule

<p>October 3 - General Election</p> <p>November 9* - see note below</p> <p>December 6 - No Forum</p> <p>January 9 - TBA</p> <p>February 6 - Nat'l Agriculture Update</p> <p>March 6 - Women's Issues</p> <p>April 3 - Gun Security</p> <p>May 1 - TBA</p>

The League of Women Voters of Seattle-King County (LWVS-KC) presents a public forum most months between September and May, generally on the first Thursday of the month at 7:30 p.m. Most forums are held at the Seattle First Baptist Church, but occasionally they are scheduled in other locations and times. The tentative schedule of upcoming forums for 2013-2014 appears at left; check *The Voter* each month or the LWVS-KC website, seattlelwv.org, for up-to-date information.

We are doing a Saturday luncheon instead of the Thursday forum in November. Terrie Klinger, Barber Professor of Sustainability Science, UW School of Marine and Environmental Affairs and Co-Director of the UW Center on Ocean Acidification will present **The Other Side of Carbon Emissions: Ocean Acidification and the Future of the Salish Sea. Saturday, November 9 at 11:30 a.m., Downstairs at Town Hall. See back cover for details.*

Board Briefs by Amanda Clark, Secretary

The League of Women Voters of Seattle-King County Board met on Saturday, October 5, 2013. This is a summary of their work.

Treasurer's Report

Currently the budget is in a negative position, largely because income now goes to the Education Fund (C-3 rather than the C-4). Also, the fall fundraising event is yet to be held. That should generate more income to balance the budget.

Endorsements

The Board considered two ballot measures, the King County charter amendment to move the public defender's office into County government and the Sea-Tac minimum wage ordinance. The Board voted to endorse the Charter Amendment: a change was mandated by the State Supreme Court, and the proposed reorganization seems reasonable.

Although the Board supports a living wage, it

voted to take no position on the Sea-Tac proposition at this time, feeling that a study was warranted instead.

The Board also voted to request that the LWVWA reconsider its decision to take no position on I-517.

Membership

Membership has been holding steady, but we would like to increase membership as well as increase the diversity of membership (ethnicity, gender, age, income, etc.). The Membership Committee will be evaluating the League's message and marketing materials with an eye toward these goals.

Voter Services

The League has held three forums so far, all well

attended, with more to come. Although volunteers registered only a few on Voter Registration Day, many people were interested in how to register on line, so we helped get the word out. Finally, Vote411.org is live—you can look up your local races. Encourage people to check it out.

Joanna Cullen, Voter Services co-chair, reminded everyone that two Legislative Action Workshops are coming up, November 2 in Everett and December 7 in Puyallup. These workshops are always a great way to learn about what's happening in the legislature and to get fired up about supporting the League's positions.

Fall Event

Lisa Unsoeld-Chang reported that planning for the annual "Hot Topics" fall event is well under way. It will be a catered lunch on Saturday, November 9, at Town Hall. The "hot topic" is ocean acidification and the Salish Sea, and the speaker is Terrie Klinger, Professor of Sustainability Science at the UW.



Mission Statement

The League of Women Voters of Seattle-King County, a nonpartisan political organization, encourages informed and active participation in government, works to increase understanding of major public policy issues and influences public policy through education and advocacy.

Diversity Policy

The League of Women Voters of Seattle-King County (LWVS-KC), in both its values and practices, affirms its beliefs and commitment to diversity and pluralism, which means there shall be no barriers to participation in any activity of the League on the basis of gender, race, creed, age, sexual orientation, national origin or disability.

LWVS-KC recognizes that diverse perspectives are important and necessary for responsible and representative decision-making. LWVS-KC subscribes to the belief that diversity and pluralism are fundamental to the values it upholds and that this inclusiveness enhances the organization's ability to respond more effectively to changing conditions and needs.

LWVS-KC affirms its commitment to reflecting the diversity of Americans in its membership, board, staff and programs.

Committees

Meetings can sometimes be subject to last minute changes. Call the LWVS-KC office at 206-329-4848 to confirm.

Economics and Taxation Committee

DATE: Saturday, November 30

TIME: 9:30 a.m.

PLACE: 909 E. Newton #D-9, Seattle

Our focus is on the issue of a “living wage.”

Education Committee

DATE: Thursday, December 5

TIME: 1:30 p.m.

LOCATION: League Office

Note: The Education Committee is not meeting in November and its December meeting is on December 5, rather than the usual 4th Thursday. If you have questions or comments, please leave a message for Education Committee Chair Joanna Cullen at info@seattlelwv.org or 206-329-4848.

International Relations Committee

DATE: Monday, November 4

TIME: 12:45 – 2:45 p.m.

PLACE: League Office

Our focus is China foreign policy.

Transportation Committee

DATE: Tuesday, November 19

TIME: 10:00 – 12:00

PLACE: League Office

Speaker: Judy Clibborn, the Chair of the House Transportation Committee.

We encourage participation by all interested members in our committees. It's a great opportunity to meet and talk to community leaders, stakeholder organizations, and experts where you can have direct input on local issues that affect you.

Don't see a committee that covers your issue? Call the office and let us know. Sometimes people are working in a more informal manner without regularly scheduled meetings. If not, we may be able to help connect you with like-minded people to start your own.



King County Connects — Announcements

HELP WANTED: PROGRAM PLANNING

As much as possible, we try to involve members in the program planning process. We are beginning that process for the League year 2014 – 2015 by soliciting ideas from units and committees. We would also like to hear from members who do not attend units. If there is a topic that you would like to see on the schedule for next year, please let us know. You may send in your ideas to the office either by email or by snail mail. The most popular ideas will form the basis for the program planning discussions in January. Please submit your ideas by December 16th.

SAVE THE DATE – ISSAQUAH UNIT HOLIDAY LUNCHEON

DATE: THURSDAY, DECEMBER 12
TIME: 11:30 a.m.

All Eastside units and members living on the Eastside including Mercer Island members of LWV Seattle/King County are invited.

WHAT TO BRING: Please bring \$6.00 to reimburse those who are supplying or buying food for our lunch.

Please let either Dorris Martin, Dor-rismrtn@aol.com, or Gaby Metzger, Gabymetz@aol.com, know by email if you plan to attend.

WHERE: Gaby Metzger's home, 4073 173rd Place SE, Bellevue.

Call the office for directions.
Carpooling will help with parking.

Action Workshops!

The annual workshops offered by LWVWA to help learn about being an effective advocate have been scheduled. There will be two on the west side this year:

Saturday, Nov. 2 - Action Workshop in Everett hosted by LWV Snohomish County

Saturday, Dec. 7 - Action Workshop in Puyallup hosted by LWV Tacoma - Pierce County

Workshops are 9:30 a.m. to 2:30 p.m.
Lunch is provided.
Registration is \$25

More details on the state League website, www.lwvwa.org, and in the weekly emails.

GREAT DECISIONS DISCUSSION GROUP by Carol Goldenberg

The League of Women Voters of Seattle/King County will sponsor a Great Decisions Discussion Group at the home of Vicky Downs on Capitol Hill beginning January 28 and continuing on alternate Tuesdays for eight sessions.

A group is also forming in the south King County area and there may be one on the eastside.

The briefing book published by the Foreign Policy Association will be available in early January.

Look for more details in the December *Voter*.

Voter Services

The Forum and Ballot Issues side of Voter Services has had a particularly busy September and October as we always do, with ballot summaries, candidate forums, and the Vote411 online voters guide dominating the scene.

We arranged and sponsored five well-attended and well-received candidate forums as well as two ballot issues forums, and wrote ballot summaries for all of the statewide initiatives and advisory measures, the two King County measures, the two Seattle measures, and the Sea-Tac \$15 minimum wage and Federal Way initiative restrictions measures, which of course were published in *The Voter*, posted on our website, and distributed for use by our Speaker's Bureau.

In December, I plan a full report on all of our accomplishments, and some lessons learned which are leading us towards a slightly different approach for the organization of fora and ballot issues writing teams for 2014. We are brainstorming around a more regional approach within the county, for better coverage of hot races that are not always right near Seattle.

For now, however, I want to thank the amazing League members who volunteered so much of their time on candidate forums (in the calendar order they occurred):

- Seattle Mayoral Forum co-sponsored with Allied Arts: Moderator - Jim Kelly of King County 4Culture; League Liaisons - Allison Feher and Julie Anne Kempf; and a big Thank you to Laine Ross of Allied Arts!
- City of Lake Forest Park Forum: Moderator - Dana Twight; League Team - Raelene Gold, Toni Potter, Amelia Woolley, Julie Anne Kempf; many thanks to Connie Pereyeni, of LFP Town Center for all of the logistics beforehand and technical assistance the night of the event.
- City of Mercer Island Forum co-sponsored with Mercer Island Reporter: Moderator - Bill Radke of NPR and KUOW; League

Team - Amanda Clark, Paneen Gordon Davidson, Cynthia Howe, Kathleen Hinson; and a big thank you to Mary Grady and Rebecca Mar of the Mercer Island Reporter.

- City of Medina Forum: Moderator - Cyndi Goddard-Woods; League Team - Dana Twight, Allison Feher, Julie Anne Kempf; thanks to Overlake Golf and Country Club for the venue contribution.
- City of Renton Forum: Moderator - Julie Anne Kempf; League Team: Allison Feher; Local Volunteers: Paul and Jean Ouelette, Doug Keyes, Dan Hemenway; special thanks to the Mayor's Office, the management and staff at the Renton Senior Center, and current Renton Councilmember Marci Palmer who is not running but helped with ground logistics.

Also, I want to thank the ballot summaries writing and editing team, with first a huge thank you to Beatrice Crane who really spent a great deal of time getting our summaries whipped into grammatical shape, as well as the entire writing and editing team of Mary Burki, Amanda Clark, Joanna Cullen, Mary Ehlers, Allison Feher, Jeanette Johnson, Julie Anne Kempf, Ann Murphy (LWV Spokane), R. Peggy Smith (LWV Thurston), Betty Sullivan, Laura Weese, Cyndi Woods, and last but not least, President Ellen Barton, League Administrative Manager Allison Feher, and *Voter* Editor Marge Baker, who are always our last eyes on the ballot summaries before they go to print.

Many, many thanks to all this 2013 election season!

Julie Anne Kempf
Voter Services Co-Chair

Great Registrars and Speakers!

by Joanna Cullen, Voter Services Co-Chair

I want to thank all the volunteers who have helped to make late September and October successful. On September 24th the League celebrated National Voter Registration Day, and Horizon House really stepped up and set up tables at both the downtown library and Cupcake Royale. Our other groups drank coffee and talked up voting at Starbucks at 23rd Avenue and S. Jackson or read a book while helping people at the Burien and Federal Way libraries. Thank you to everyone who participated.

Our ballot issues presenters have been popular this month, and again thank you to Susan Jones, Julie Anne Kempf, and Cyndi Woods. While Allison Feher is usually right there behind the scenes helping, she also got out of the office to give a presentation on Women's Suffrage at South Seattle Community College. Thank you, Allison.

Building the core group of presenters is central to our mission to provide voter education. Without our volunteers it would be impossible for the League to accomplish this goal. Please, if you are interested in registering voters or in becoming one of our presenters, call the office at 206-329-4848 and leave a message for Joanna Cullen. The number of requests often slows down after the election, but that is the time to expand our trained volunteer base in order to serve our requests in the future.

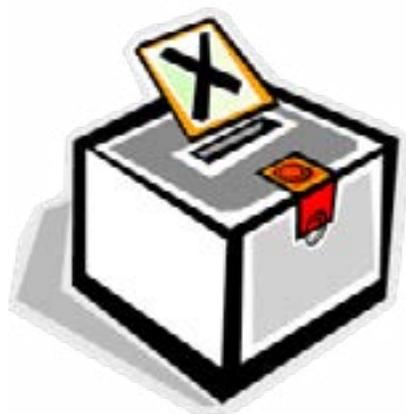
Vounteers Wanted!

2014 is coming up fast and we'll be needing volunteers to help us update "TRY" - our annual directory of elected officials.

This means designing the cover, going online to check out websites, updating spreadsheets, making phone calls to double-check information and get last minute updates, and proofreading! This is definitely a case of many hands making light work.

Please call the office and talk to Allison if you are interested in helping out. We'll be getting started after the election and doing the bulk of the work before the year end holidays with a final push the week the new legislative session starts, on January 13. The work can be broken into small chunks so even a few hours of your time would be a big help.

**Don't Forget to Return Your Ballot!
On or Before November 5**



Getting Connected Membership News

Report from the Membership Committee

Our team has been meeting to review the documents and other marketing materials that the League uses to connect with new and prospective members as well as the current membership. These include the membership brochure, the packet sent out to new members, and more. The first thing we want to revise is the questionnaire we send out when you first join (and include on your renewal form) that helps us identify your areas of interest and how to connect you to League. League members tend to be interested in an awful lot of things so we're hoping to revise it in a way that better defines your interests and level of commitment and perhaps keeps us from hounding you when perhaps you don't have the time/energy to be actively involved at this time. Stay tuned for more info and a possible survey!

A Time to Say Thank You

Before we get to the turkey, the football games, and the shopping, we want to say thank you to all our wonderful members who support the League in so many ways. As many of you know, the work of the organization is done almost exclusively by volunteers – without you we would be nothing. Take a moment to reflect on the many ways you support the League, your community, friends, and family. Give yourself a nice pat on the back and then help us applaud your fellow League members:

Our stalwart "CIS desk" team. These volunteers spend 3 hours every week in the office answering the phone and providing our "citizen information service." From simple questions like "how do I find out who my representatives are?" to more complex questions like "what does it mean when it's an advisory vote?" these volunteers are here to answer questions from the public on a wide variety of issues. They

also take calls from you, the membership, and handle tasks for the treasurer, the membership team, and the voter services team. Kudos to Cynthia Howe, CIS desk coordinator, and volunteers Maggie Duncan, Mary Barton, Ruthie Dornfeld, Amanda Berry, Rita Lee, Candis Litsey, Amelia Woolley, Carol Goldenberg, and Betty Sullivan. Thanks also to Pat Cleary, Beatrice Crane, Lois Laughlin, Rivian Smith, and Laraine Volkman who fill in from time to time.

Our voter services team. Julie Anne Kempf and Joanna Cullen thanked their team (on page 9-10) but lets give the two of them a standing ovation for the amazing work they did leading all those projects this election season.

Our committees and units. You are the backbone of the organization. Without your regular participation at committee and unit meetings, we wouldn't have any of the consensus positions we use to lobby our elected representatives; the League wouldn't have its reputation for thoughtful study and consideration of the issues; and we wouldn't be the engaging and fun group of individuals who stay involved year after year. An extra thank you to those who take on the role of committee chair or unit leader; there isn't room to list you all here but we thank each and every one of you!

Our president and board. Leading an organization of intelligent, driven, assertive individuals is a real challenge and these women have stepped up to it. Being a board member means understanding League history, positions, and process (sometimes obscure), listening to the wishes of the membership, and paying attention to the issues in the community, and then somehow striking a balance between all of those. Several of them are quite new to League so they've faced a steep learning curve. Please give them a hand - both figuratively and if they call you for help on project!

Finally, we'd like to say thank you to those who support the League financially - some things, like hosting the website, printing the TRY, and keeping up the office, cannot be done by goodwill or volunteer effort alone. So we appreciate those who can and choose to donate to the League. Recent donors include Anne Anderson, Linda Gage, Peggy Johnson, Edith Miller, Stan Moberly, Jan Orlando, Elsie Simon, and Bobbie Westfall, as well as booster members Carol Burkhart, Jane Commet, Lucy Gaskill-Gaddis, Beverly Harison Tonda, Eleanor Laxdall, Jeanne Lee, Virginia Leland, Sue Mecklenburg, Michele Meith, Margaret Morrow, Nancy Robinson, Rainer Storb, Sarah Weems, and Helen West, supporting member Valerie Payne, sustaining member Gail Winberg, and Leadership Circle donors Nancy Alvord, Ellen Barton, Nancy Eitreim, Ginna Owens, Nancy Smith, and Cyndi Woods.

The November 9th event will kick off our year end fundraising efforts for the Education Fund. Donations at the event and in response to the letter you will receive later in November will be helping to support all those great voter service activities we've completed this election season as well as the annual printing and distribution of They Represent You (TRY), our annual directory of elected officials. We thank you in advance for your continued support.

In Memoriam

Lenore Rice Hale was born in Dayton, Ohio in 1929 and died peacefully at age 84 on October 5, 2013 at her residence at Horizon House with her daughter Betsy and granddaughter Elise at her side. She left a legacy of public service, a career in social work and steadfast dedication to her family and friends.

Lenore graduated in 1951 from Mt. Holyoke College after a childhood upbringing devoted to music, religion, education and civic engagement. She also became an accomplished pianist and avid jitterbug dancer. A year later she married Charles Hale who later became a professor of history at the University of Iowa. The couple

and their four children spent most of the next few decades in Iowa City and Lenore earned a graduate degree in social work. Upon graduation, she worked as a family counselor in the Department of Child Psychiatry at the U. of Iowa. Even after her retirement in 1989, she continued to work as a volunteer counselor at the Senior Center in Iowa City.

In 2004, Lenore and Charles moved to Seattle. After Charles' untimely death four years later, Lenore settled at Horizon House where she became active in the League as well as the Ethnic Awareness Committee and a weekly writing class. It was her writing class that spawned the publication of her memoir and later the Washington Stories Fund, a program she helped to establish after completing her book.

Lifelong Seattle resident and peace activist Helen Lewis Karr died on September 20 of this year at the age of 98. She was born in 1915 and lived most of her childhood in the Seward Park neighborhood, graduating from Franklin High School and later earning a B.A. degree in English at the University of Washington in 1938. A year later she earned a second degree in library science that helped her secure a job in Tacoma at the University of Puget Sound.

Helen's interest in social justice eventually led her to the Bay Area of CA where she studied at the Pacific School of Religion and worked at the Berkeley YWCA. It was there that she met her lifelong partner, Milton Karr, whom she married in 1949 in Seattle. Upon his completion of a MSW degree, the couple moved to Seattle and settled in Madrona. They both became active members of Plymouth Congregational Church and joined its Peace Action Group as charter members. Helen and Milton were dedicated pacifists; they belonged to the Fellowship of Reconciliation and participated in many anti-war demonstrations over the years.

Helen outlived both her husband and son Michael but is survived by two granddaughters and several great grandchildren.

Features

PRESCHOOL FOR ALL - by Nancy Bagley

Preschool for All is the goal of a resolution passed unanimously by the Seattle City Council September 23, 2013. The resolution begins the process of creating a voluntary, high quality preschool program for three and four year olds that is accessible and affordable for all families living in Seattle.

The City Council Government and Finance Committee, chaired by Councilmember Tim Burgess, has led the analysis and planning efforts over the past several months that led to the adoption of this bold and ambitious goal of Preschool for All. The committee reviewed research and met with experts in the field of early learning. What they learned is that high quality preschool can have long lasting academic and emotional development benefits for children from a variety of socio-economic backgrounds. Recent research supports the benefits of preschool for all children, rather than programs that target only low-income families. More information on the resolution, the plans, and the research can be found at the Preschool for all Website: <http://www.seattle.gov/council/issues/PreschoolforAll/default.html>

The League of Women Voters has studied early childhood education at the national, state, and local level and has reached agreement on the need for equitable, quality public education for all children pre-K through grade 12. The LWV of Seattle/King County “supports the use of public funds for programs that meet the cognitive, physical and social needs of children from birth through age eight; that encourage parent education and involvement; and that provide health and human services to these children and their families. The goal of early childhood programs is to provide all children in our community with quality programs, using sliding scale fees, where appropriate...” We enthusiastically support the

goals of the Preschool for All Resolution, and we plan to follow closely its implementation over the course of the next few months.

Councilmember Tim Burgess will meet with the Education Committee Thursday, December 5 at 1:30 p.m. to present and discuss Preschool for All. (Please note that this date and time are a change from our usual fourth Thursday meeting schedule.) We encourage all interested League members to attend the meeting.

TRANSPORTATION COMMITTEE REPORT - by Janet Winans

Because the 2013 legislative session was so critical to the ongoing process to plan and meet state transportation needs, the agenda for our 2013-14 Puget Sound Regional League Transportation Committee is to learn how to engage the resources of the League more effectively in the 2014 legislative session. Of course, any lobbying of the legislature is the role of the League of Women Voters of Washington (LWVWA), not local leagues. We intend to be the best partners that we can be to Cynthia Stewart, the transportation portfolio chair, and the rest of the LWVWA lobbying team. However, the Seattle-King County League has many members who may contact their legislator. Our transportation committee will be a resource to you, as well as Leagues in Kitsap, Snohomish and Pierce Counties, the region of our committee.

We began our learning process in September when members of our committee attended the “Listening Tour” that Senators Curtis King and Tracey Eide, co-chairs of the Senate Transportation Committee, held in Bellevue on September 19. The Senators committed to the tour because

many citizens and interest groups and the governor are very concerned about the failed attempts to pass a transportation budget that confronts current needs during the 2013 session.

There is little disagreement about transportation NEEDS; every community in the state has crumbling infrastructure and has a need for new resources. The issue is that all of the “full faith and credit” of the state was committed in 2003 to fund the projects needed at that time. There can be no new funding unless the legislature agrees to new sources of revenue.

Members of our committee will attend the LWVWA outreach meetings held with local leagues around the state in order to open conversation about transportation needs and solutions in their communities.

Our November speaker will be Judy Clibborn, the Chair of the House Transportation Committee. She and her committee worked to build a transportation budget that included new revenue during the 2013 Session. She will provide very necessary information about that legislation and about how to work to address the still critical issues left undone.

NEWS FROM THE ECONOMICS & TAXATION COMMITTEE

by Jeanette Johnson

This article is being reprinted because the last paragraph was inadvertently omitted last month. This is the third in a series of articles about America's growing economic inequality crisis and what we can do about it based on Timothy Noah's book, The Great Divergence.

The past two months I looked at how America's economic inequality crisis has grown worse since 1979 and began to examine some of the possible reasons for this. This month I look at two other possible causes: immigration and

technology.

Immigration: The Immigration and Nationality Act of 1965 eased immigration restrictions in the U.S. and was the catalyst for the upsurge in immigration that began in the late 1960s. Over the years, this has culminated in a foreign-born population today of about 13% compared to about 5% in 1965. Some have pointed to this influx as a contributing factor in lowering wages and an important factor underpinning the increase in economic inequality. But the best evidence is that the impact of immigration on income inequality has been limited.

The most authoritative study was done by George Borjas and Lawrence Katz of Harvard, who specifically looked at immigration from Mexico. According to Borjas and Katz, “between 1980 and 2000 Mexican immigration reduced the income of native-born high school dropouts (‘who roughly correspond to the poorest tenth of the workforce’) by 7.4 percent,” or about 0.4% per year. The conclusion from this study was that immigration from Mexico has not significantly impacted overall economic inequality in the U.S., even though it has had some impact on the wages of native-born high school dropouts.

Technology: One popular explanation for the rise in inequality is that it is due to technology. The story goes that technology has eliminated many middle-class jobs and replaced them with lower-wage service jobs. At the same time, the number of jobs has increased for highly-educated, computer-savvy workers.

Thus, computerization has created “a polarization of employment,” with job growth concentrated in both the highest- and lowest-paid occupations, while jobs in the middle have declined. (David Autor and David Dorn, *New York Times*, August 24, 2013.)

The notion that technology caused the rise in income inequality raises a number of questions.

For one, it doesn't explain why job polarization is so much worse in the U.S. than in other advanced industrialized democracies. Nor can it explain why income inequality began well before the current computer age. It's important to keep in mind also that technological advances requiring increasingly skilled workers have been a dominant characteristic throughout the twentieth century without resulting in an increase in inequality. So, what seems to be different this time?

Harvard economists Claudia Goldin and Lawrence Katz say the difference today is that the supply of educated Americans is no longer keeping up with the demand for skilled workers. High school graduation rates have leveled off at 75%, and, while college attendance rates continue to climb, college graduation rates have slowed. This slowdown in educational attainment appears to be a "uniquely American" trend among industrialized democracies, according to Noah.

Faced with the crunch for more highly-skilled workers, American employers have been willing to pay a wage premium to those with the requisite education. For college graduates the wage premium has nearly doubled since 1980, while the median salary for a male high school graduate who did not go on to college has significantly declined.

Dean Baker, co-director of the Center for Economic and Policy Research, has a different take on how technology has impacted inequality. He argues that the claim about how technology has displaced middle-wage jobs and how it has been responsible for the upward redistribution of income over the past three decades has no factual basis. According to Baker, the upward distribution of income was actually the result of multiple policy choices by decision makers over the past 34 years. I will talk more about this in a future article.

(cover article continued)

Order 12-07 directing the Department of Ecology and other cabinet agencies to implement the panel's key early actions. She proposed in her 2013-15 budget \$3.31 million as a down payment on ocean acidification strategies, including money to start the Ocean Acidification and Adaptation Center at the University of Washington.

Climate change problems have been a major concern in a blog of mine in the SeattlePI.com for 4½ years. When I wrote about the political dichotomy over whether education deserves government support, I paraphrased Bill Clinton, who might say, "It's education, Stupid". My chief editor Marcia Brown usually deletes that last word as "undignified," but since the former president (and many of my commenters) use the word, it survived the editor's pencil in a couple of blogs: about Education, Sunday, October 24, 2010; and on the Population Explosion, Friday, May 29, 2009. It is extremely difficult to stay educated on these complex subjects, and when education is absent, so is logical choice. So November's talk will get you educated on **ocean acidification**, and address the last item in my first paragraph — it's coming to a neighborhood near you.

***"For most of history,
man has had to fight
nature to survive;
in this century he is
beginning to realize that,
in order to survive,
he must protect it."
—Jacques-Yves Cousteau***

BOOK REVIEW by Vicky Downs

THE BIG THIRST: THE SECRET LIFE AND TURBULENT FUTURE OF WATER

By Charles Fishman

When I read out loud short pieces of this book to my teenage granddaughters, they were fascinated. Fishman provides a virtual ocean of information and lively anecdotes to help us understand what water is. Here are a few favorite examples:

Water not only appears as solid ice, liquid water, and gaseous steam, but in a fourth state, “molecular water.” If you have a countertop made from the mineral serpentine, a 4’ x 3.5’ section could weigh 200 pounds, of which H₂O would be “ten liters of water baked into the stone.” Serpentine is created hundreds of kilometers deep in the Earth where, under enormous pressure and temperature, “one of the hydrogens [peeled] off the water, leaving the OH and the separate H to wriggle into the structure of the stone... [If ground to powder and then] put under pressure the OH and hydrogen [in the serpentine] come out as water.” “It is where most of the planet’s water might be, in fact. In rocks.”

The total water on the surface of the Earth is only a very small portion of the entire mass of our globe. “If Earth were the size of a Honda Odyssey minivan, the amount of water on the planet would be a single, half-liter bottle of Poland Spring in one of the van’s 13 cup holders.”

“No water is being created or destroyed on Earth. So every drop that’s here has seen the inside of a cloud, and the inside of a volcano, the inside of a maple leaf, and the inside of a dinosaur kidney, probably many times.” “Every glass of water you pour...has a rich history.” It has been recycled over and over.

How we recycle is important. Fishman says that in water-scarce areas it makes no sense to use 1.6 gallons of drinking-quality water every time we flush a “low-flush” toilet or water our gardens. For such areas he recommends simple recycling to make clean-but-not-potable quality

water. The same level of filtering should also be done using catchments before allowing something like runoff from roads to pollute rivers and lakes, or, we can assume in Seattle’s case, Puget Sound.

In some places, droughts and other extreme weather conditions are especially unpredictable. Las Vegas is an example of a city that has done an impressive job of learning to use much less water, while providing enough to provide for local basic needs and to help the tourist industry offer the sense of a watery oasis. The Director of Southern Nevada Water Association (SNWA) imposed many water-saving rules such as enforcing the use of hoses with a spring-loaded automated turnoff, and incentives such as offering “\$1 to \$1.5 for every square foot of grass removed and replaced with desert landscaping.” Homeowners and golf courses made money on that offer, and the metropolitan area saved millions of gallons of water every day.

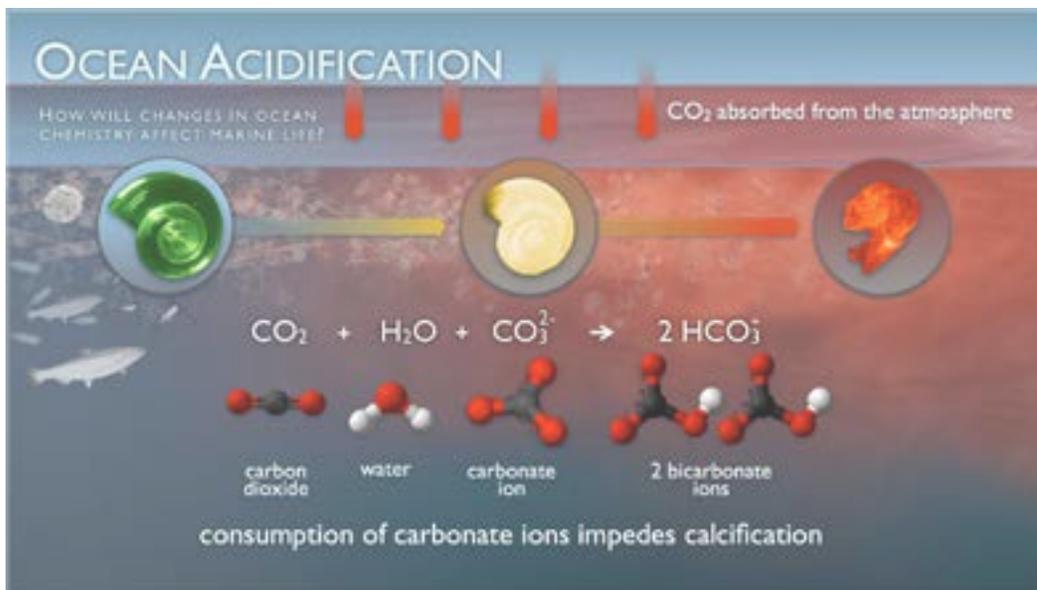
Many people believe water is a growing global problem, but each water crisis is local, because water is difficult to ship. Fishman says, “It is our fate that hangs on how we approach water.” Though he doesn’t write about Seattle, we know we have a healthy water supply, but an earthquake could change that in seconds. We know too that we need to continue improving the runoff that fouls the sound, lakes, rivers, and streams.

Water is amazing; it “can be cleaned up, always” and “you can’t use it up.” Thanks to Fishman, I have a new appreciation for every cup of coffee or glass of water I drink.

The opinions in this review are personal and do not represent those of the LWV.



The Other Side of Carbon Emissions:



Ocean Acidification and the Salish Sea

November 2013

Selected Readings

UNIT MEETING AGENDA

UNIT BUSINESS:

- Introductions and welcome of guests and visitors
- Attendance and sign-ups
- Board Announcements
- Program Planning – For those units that will not be meeting in December (and those that prefer to do it this month); it should not take up more than twenty minutes of discussion time.

PRELIMINARY PROGRAM PLANNING:

What topics would you like to see on the program in League year 2014 – 2015? Ideas may include hot topics for forums and possible subjects for studies and updates. A list of the most popular topics generated by units, individual members, and committees will form the basis for our program planning discussions in January.

DISCUSSION QUESTIONS:

Note for facilitators and recorders: Because this is not a study, there are no consensus questions and you are not required to reach consensus. Nevertheless, please discuss the following and record the gist of your discussions. These notes help guide the board and the program planning committee in developing future activities on this topic.

1. What is the first thing that comes to your mind when you hear the words climate change?
2. What is ocean acidification, where does it come from, and is it related to climate change?
3. What are possible effects of ocean acidification, good and bad?
4. Is the Salish Sea unique in its acidification?
5. How can ocean acidification be stopped or slowed?
6. How do you think ocean acidification will affect you personally?
7. Do you see a role for the League in responding to ocean acidification?
8. Are there other aspects of climate change that you would like included in a future League program?

CLIMATE CHANGE & OCEAN ACIDIFICATION — BACKGROUND INFORMATION

The following items have been excerpted by Dr. Robert Brown, Ph.D., Department of Atmospheric Sciences, and Dr. Terrie Klinger, Ph.D., Barer Professor of Sustainability, both at the University of Washington, from several documents produced by the Washington State Department of Ecology to provide us with background information on the effects of CO² emissions on our beloved Salish Sea. Citations to the full source material and other useful resources can be found at the end of this section.

Ocean Acidification: What You Need to Know

Q: What is ocean acidification?

A: Ocean acidification is a prolonged reduction in seawater pH driven primarily by increasing levels of carbon dioxide (CO²) absorbed by the ocean from the atmosphere. This CO² reacts with sea water to form carbonic acid, which increases seawater acidity and decreases the amount of calcium carbonate available to shell-forming organisms. An increase in acidity means a reduction in pH. The pH scale has a range of 0 to 14.

Solutions with pH below 7 are acidic and solutions above 7 are basic. Normal seawater has a pH of about 8.1. Acidification does not mean the oceans are acidic, for example that seawater pH is below 7. The term means that the ocean is becoming more acidic (for example, the pH is dropping below 8.1).

Q: What causes ocean acidification?

A: The principal cause at the global scale is CO² emissions from human activities. The oceans have absorbed approximately 25 percent of the CO² generated by human activities since the start of the industrial age in the mid-1700s. Ocean acidification has increased 30 percent in that time. This rate of change is nearly ten times faster than any time in the past 50 million years. Ocean acidity is projected to increase by 100-150 percent by the year 2100, given the current rate of CO² emissions.

Q: Why is ocean acidification a problem for Washington?

A: Ocean acidification is appearing in Washington decades sooner than anticipated. A combination of regional factors can exacerbate acidification caused by global CO² emissions:

- Coastal upwelling of offshore CO²-rich and low pH waters from the deep ocean onto continental shelf.
- Runoff of nutrients from land-based activities and decay of organic matter in subsurface waters.
- Emissions of other acidifying gases, such as nitrogen oxides (NO_x) and sulfur oxides (SO_x).

Q: What are the implications for Washington's marine species and ecosystems?

A: Many life processes are sensitive to carbon dioxide and pH. Research shows calcifiers are particularly affected by ocean acidification. Calcifiers are marine organisms that depend on the mineral calcium carbonate to make shells, skeletons, and other hard body parts. Ocean acidification makes an essential component of calcium carbonate – the carbonate ion – more scarce. As a result, calcifiers have to use more energy to pull carbonate ions out of the water to build their shells. Calcium carbonate also dissolves more easily as acidity increases. These changes can result in slower growth and/or higher mortality among calcifiers, especially in shellfish larvae and juvenile shellfish.

More than 30 percent of Puget Sound's marine species are calcifiers: oysters, clams, scallops, mussels, abalone, crabs, geoducks, barnacles, sea urchins, sand dollars, sea stars and sea cu-

cumbers. Even some seaweeds produce calcium carbonate structures.

Many calcifiers provide habitat, shelter, and/or food for various plants and animals. For example pteropods (pronounced “TARE-a-pods”), the delicate free-swimming snails, are eaten by seabirds, whales and Alaska pink salmon. Some species of copepods - small crustaceans eaten by juvenile herring and salmon – are also affected. Impacts on species like the pteropods and copepods are a significant concern because of their ability to affect the entire marine food web.

Q: Why does Washington need to act on ocean acidification?

A: Washington State has the most productive commercial shellfish industry on the West Coast. Annual sales of farmed shellfish from Washington account for almost 85 percent of U.S. West Coast sales, including Alaska. The shellfish industry generates \$270 million annually, and directly and indirectly supports 3,200 jobs.

Massive die-offs of oyster larvae at Pacific Northwest hatcheries between 2005 and 2009 due to low pH seawater entering the hatcheries highlighted the potential impacts of ocean acidification on this multi-million dollar industry. In addition, impacts to marine food webs could affect Washington’s seafood industry, which generates over 42,000 jobs in Washington and contributes at least \$1.7 billion to its gross state product.

Recreational oyster and clam harvesters generate \$3 million annually in state revenue and contribute more than \$27 million annually to coastal economies.

Washington coastal tribes depend upon shellfish for food, income and connection to their cultural heritage.

Q: Why is Washington well-positioned to tackle ocean acidification?

A: Ocean acidification is a problem that we can address, although it will be challenging. Washington has much to draw on to tackle this problem. Some of the world’s leading experts on ocean acidification, pollution reduction, and marine resource management work at the University of Washington, the National Oceanic and Atmospheric Administration, state agencies, and nonprofit organizations.

Additionally state agencies, businesses, and tribes are taking the lead in developing innovative approaches that reduce carbon dioxide and nutrient runoff, and state and tribal leaders are actively engaging with our federal partners to find solutions to ocean acidification. We also have a shellfish industry committed to protecting native ecosystems as well as farmed resources, and a diverse nonprofit community ready to work with the public on understanding the problem and how we might solve it. Finally, we have citizens who value the rich and diverse ecosystems in Washington’s marine waters.

Q: What is Washington doing about it?

A: When governor Gregoire convened the Blue Ribbon Panel on Ocean Acidification in February, 2012, Washington became the first state in the nation to tackle ocean acidification at this level. The 28 member Panel consists of scientists; public opinion leaders; industry representatives; state, local, federal, and tribal policy makers; and conservation community representatives. The Panel was charged by the Governor with reviewing the best available science, and producing a set of recommendations to guide Washington’s response to ocean acidification.

Q: What did the Panel produce?

A: The Panel scientists reviewed and summa-

rized the current state of scientific knowledge about ocean acidification in Washington State. A technical document was produced, Scientific Summary of Ocean Acidification in Washington State Marine Waters. The document was the foundation for the Panel report, Ocean Acidification: From Knowledge to Action, Washington State's Strategic Response. Both documents were submitted to the Governor on November 27, 2012.

Q: What are the recommendations of the Panel?

A: The Panel recommended 42 actions that will:

- Address the root cause of acidification by reducing carbon dioxide emissions.
- Reduce local land-based pollutants that worsen acidification.
- Foster adaptation and remediation to protect shellfish industry and marine ecosystems.
- Increase research and monitoring of acidification in state waters.
- Inform, educate, and engage the public, stakeholders, and decision makers in responding to ocean acidification.
- Maintain a sustained and coordinated focus on ocean acidification.

Q: What early actions will be taken?

A: The Panel recognized that it is not possible to implement all the recommendations simultaneously. Consequently it has designated 18 of the 42 actions as "key early actions" that are essential next steps for reducing the risks associated with acidification.

On November 27, 2012 Governor Gregoire signed Executive Order 12-07 directing the Department of Ecology and other cabinet agencies to implement the Panel recommendations, specifically to:

- Advocate for reductions in emissions of carbon dioxide.
- Work with the University of Washington

and others to coordinate and conduct scientific investigations and ensure continued science and policy collaborations.

- Execute a memorandum of understanding among key state and federal agencies.
- Reduce nutrients and organic carbon in priority areas.
- Request that the EPA assess water quality criteria relevant to ocean acidification.
- Increase public understanding of ocean acidification and its consequences.
- Consult on government-to-government basis, with affected and interested Indian Tribes and Nations in Washington State.

Ocean Acidification in Washington State - From Knowledge to Action

The increasing level of carbon dioxide emissions in the atmosphere is causing the acidity of sea water to increase. Numerous animals and plants in the sea have calcium carbonate shells or skeletons. Some are sensitive to small changes in acidity and there is evidence they are already affected, as seen by the massive die-offs of oyster larvae at Pacific Northwest hatcheries between 2005 and 2009. Ocean acidification is a major threat to Washington's marine species and ecosystems and our economy.

Washington is the nation's top provider of farmed oysters, clams and mussels. The shellfish industry generates \$270 million annually, and directly and indirectly supports 3,200 jobs. Impacts to the marine food webs could affect Washington's seafood industry, which generates over 42,000 jobs and contributes at least \$1.7 billion to gross state product. Recreational oyster and clam harvesters contribute more than \$27 million annually to coastal economies. Washington tribes depend upon shellfish for food, income and connection to their cultural heritage.

A first-of-a-kind comprehensive state-level effort to address ocean acidification was unveiled on November 27, 2012. The Washington State

Ocean Acidification Blue Ribbon Panel (the Panel) convened by Gov. Gregoire in February 2012, summarized the current state of scientific knowledge of ocean acidification pertinent to Washington and produced a comprehensive set of recommendations. The Panel identified 18 key early actions, out of 42, that should be acted on now based on urgency and relative importance. The key early actions are necessary to ensure the continued viability of native and commercial shellfish species and to make real progress against the threat of ocean acidification to our marine resources, our economy, and jobs that depend on these resources. On November 27, 2012, in response to the Panel's recommendations, Gov. Gregoire issued Executive Order 12-07 directing the Department of Ecology and other cabinet agencies to implement the Panel's key early actions. The Governor also proposed a new Center for Ocean Acidification at the University of Washington; and \$3.31 million in biennial state funding to the University of Washington, and the Departments of Ecology and Natural Resources to begin to implement the Panel's key early actions. Full implementation of many of the key early actions listed below will require additional funding, with some requiring sustained funding beyond this biennium.

The proposed Ocean Acidification Impacts and Adaptation Center will be housed within the University of Washington's College of the Environment, a national leader in environmental research. The Center will advance the Panel's research and monitoring recommendations and will lead and foster ongoing decision-relevant science regarding ocean acidification.

The Center will enhance and maintain coordination and collaboration among researchers across the UW and other regional academic institutions, and public, private and tribal entities, while continuing to engage the full spectrum of interests and expertise represented by the Blue Ribbon Panel. An advisory board and an ocean acidification science coordination team will be

created by the Center to meet this charge.

A proposed \$600,000 will fund a core staff at the Center. The Center will be modeled after, and integrated with, the UW's Climate Impacts Group (CIG), a highly respected leader in developing and delivering scientific information to decision makers at all levels.

A proposed \$1.22 million will fund the following key research and monitoring actions at the University of Washington, under the responsibility of the Center:

- Ensure continued water quality monitoring at the six existing shellfish hatcheries and rearing areas to enable real-time management of hatcheries under changing pH conditions. (Action 6.2.1). The monitoring data have enabled hatchery operators to avoid drawing acidic water into the hatcheries and rearing areas. \$150,000
- Establish an expanded and sustained ocean acidification monitoring network to measure trends in local acidification conditions and related biological responses. (Action 7.1.1). This monitoring will allow detection of local acidification conditions and increase our scientific understanding of local species responses. \$475,000
- Conduct laboratory studies to assess the direct causes and effects of ocean acidification, alone and in combination with other stressors, on Washington's species and ecosystems. (Action 7.3.2). The action will focus on determining the biological responses of species of ecological, economic, and cultural significance, to a full suite of stressors to which they are exposed, and will help estimate the genetic potential of these species to adapt to ocean acidification. \$170,000
- Establish the ability to make short-term forecasts of corrosive conditions for application to shellfish hatcheries, growing areas, and other areas of concern. (Action 7.4.1) A real-time online tool will be developed and accessible to shellfish growers and managers to track acidification on a scale of days to

weeks, giving them time to change or adjust their hatcheries' operation. \$325,000

- Investigate and develop commercial-scale water treatment methods or hatchery designs to protect larvae from corrosive seawater. (Action 6.2.3). Scientists from the UW will help shellfish growers assess the effectiveness of the adaptation measures. \$100,000

Washington Department of Ecology

The Department of Ecology is directed by Executive Order 12-07 to coordinate implementation of the Panel's recommendations. A proposed \$980,000 will fund the following actions:

- Quantify key natural and human-influenced processes that contribute to acidification based on estimates of sources, sinks, and transfer rates for carbon and nitrogen. (Action 7.2.1). This action will provide us with an analysis of the relative importance of local contributions to ocean acidification and whether more stringent controls of nutrients and organic carbon will be required. \$480,000
- Implement effective nutrient and organic carbon reduction programs in locations where these pollutants are causing or contributing to multiple water quality problems. (Action 5.1.1). Existing and emerging tools and cross-organizational teams with local knowledge and implementation expertise will be used. \$380,000
- Increase understanding of ocean acidification among key stakeholders, target audiences, and local communities to help implement the Panel's recommendations. (Action 8.1.2). A variety of communication tools will be developed and targeted to various audiences. \$50,000
- Provide a forum for agricultural, business, and other stakeholders to engage with coastal resource users and managers in developing and implementing solutions. (Action 8.1.4). Early and ongoing communication between governmental agencies, academia,

and agricultural, business and other stakeholders will be initiated. \$70,000

Washington Department of Natural Resources

The Department of Natural Resources is responsible for a wide range of adaptation and remediation projects. A proposed \$510,000 is provided to the Department to implement the following actions:

- Determine the association between water and sediment chemistry and shellfish production in hatcheries and in the natural environment. (Action 7.3.1). The results from this action will help guide management strategies for wild populations and culture practices in hatcheries and farms. \$150,000
- Develop vegetation-based systems of remediation for use in upland habitats and in shellfish areas. (Action 6.1.1). Using vegetation to reduce nutrients and remove carbon dioxide from seawater can help save vulnerable young shellfish from acidification and hypoxia. \$160,000
- Identify, protect, and manage potential refuges for organisms vulnerable to ocean acidification and other stressors. (Action 6.3.2). Areas that provide refuge to affected species (i.e., areas where acidification is likely to occur more slowly or to a lesser extent than in other areas, due to physical features) will be ranked high and will be recommended for conservation and protection. \$200,000

Washington State Blue Ribbon Panel on Ocean Acidification Scientific Summary of Ocean Acidification in Washington State Marine Waters

Summary Excerpt

The estuarine and coastal waters of Washington State provide important resources and services for supporting and sustaining the lives and culture of its population, including food, recreation, nutrient cycling, and moderating climate, all of which contribute substantially to Washington's economy. However, in recent years, sci-

entists have demonstrated that the chemistry of the oceans is changing in ways that will have significant impacts on the services and resources it provides. For more than two and a half centuries, humans have injected vast quantities of carbon dioxide (CO²) into earth's atmosphere through the burning of fossil fuels and land use changes. Approximately one quarter of this anthropogenic, or human generated, CO² has been absorbed by the ocean, causing the ocean's upper-ocean pH to decrease by about 0.1, in a process known as ocean acidification (OA). By the end of this century, surface ocean pH is expected to decline by another 0.3–0.4 pH units, with aragonite (a colorless, blue to violet, or yellow mineral consisting of calcium carbonate) saturation state decreasing below the current range of annual variability within 12–40 years. Washington State is particularly vulnerable because of its location and regional oceanography. Atmospheric CO² is indisputably the most important driver of ocean acidification in the open-ocean waters of the North Pacific, and unless carbon emissions are rapidly brought under control, it will dominate at the local level as well within the coming decades. For now, however, acidification in Washington State coastal waters is driven by a combination of factors, particularly in the deep waters of Puget Sound and the nearshore regions that are so important to Washington's shellfish industry. Our waters are exhibiting the effects of not only the global atmospheric CO² increase, but also other processes that can contribute to regional acidification:

- Upwelling of high-CO² ocean waters — When northerly winds blow across Washington's offshore waters, cold, CO²-rich seawater wells up from the ocean depths to flow onto the continental shelf and eventually into Puget Sound and coastal estuaries. These waters have naturally low pH from respiration processes and, combined with the added contribution of the anthropogenic CO², become corrosive to shell-forming organisms such as oyster larvae, clams, mussels, crabs, abalone, and pteropods.
- Nutrients—Many different processes deliver nutrients such as nitrogen, silicate, and phosphorus to Washington waters. Upwelling, for example, may bring nutrients from deeper offshore regions, while erosion or fertilizer runoff may bring nutrients from the land to the sea. These nutrients can stimulate the growth of marine algae, thus serving to temporarily decrease seawater CO² and increase pH of the surface waters. These algal blooms, however, are eventually followed by death and decomposition at depth, which returns CO² to these waters and drives pH values down in the deeper waters. Episodes of coastal hypoxia (very low oxygen levels) are an indicator of this process.
- Organic carbon — Similarly, rivers and streams may deliver living or once-living organic matter to the coastal ocean. The eventual decay of this biogenic material releases acidifying CO² back into the water via bacterial respiration.
- Freshwater—Rivers and stormwater runoff also deliver freshwater, which often has pH values and calcium carbonate saturation states lower than seawater.
- Other acidifying gases—Gases such as nitrogen oxides (NO_x) and sulfur oxides (SO_x) from the burning of fossil fuels form acids when dissolved in seawater.
- Other acidifying wastes—Wastes from industrial or other human activities are sometimes delivered directly to marine waters. Some of these wastes can be acidic.
- Experiments performed under laboratory conditions indicate that many marine species are sensitive to CO² enrichment of seawater. Some of the most compelling evidence to date comes from marine invertebrates. While substantial variation in response occurs among species and life stages, shelled invertebrates generally exhibit negative responses to conditions of elevated CO² and reduced pH. Invertebrates that have exhibited negative responses to OA condi-

tions include several of economic and cultural importance in Washington State; for example, oysters, clams, and mussels. In many of these, larval stages have been demonstrated to be more sensitive to OA conditions than adult stages. Elevated seawater temperature has been shown to exacerbate the negative effects of OA in many species.

Negative effects of OA are not restricted to invertebrate species. In systems outside Washington, marine fish species have exhibited negative responses to OA conditions that include changes in growth, survivorship, and behavior. Marine phytoplankton have shown varied responses to OA that include changes in growth rate and calcification. Some toxic species of phytoplankton have shown elevated production of biotoxins under OA conditions. Given the large number of species for which negative responses to OA have been demonstrated, changes in food web structure and function are likely.

Not all species respond negatively to OA conditions. For example, some seagrass species appear to benefit from CO² enrichment, and some macroalgae (for example, kelps) also could respond positively to elevated CO². These findings offer potential mitigation benefits that, under appropriate conditions, could help to ameliorate the negative effects of CO² enrichment in Washington waters.

The scientists on the Panel reviewed the current literature and research and monitoring capabilities with respect to OA in Washington State coastal waters and have identified critical gaps in our understanding and capacity. We have made recommendations for four Research and Monitoring Strategies of equal importance. Under each of these strategies we have provided a prioritized list of specific actions. (These are presented in Chapter 7 of the full report.)

Ocean acidification in Washington's waters

Ocean acidification is an emerging problem caused primarily by carbon from the atmosphere, and it poses a threat to Washington's economy, marine ecosystem and quality of life. As a result of leadership in climate change, Washington already has some strategies in place to reduce emissions in Washington. Since 2005, the state has:

- Adopted clean cars and alternative fuel standards.
- Established a standard for renewable energy in Washington.
- Adopted changes in the energy code to achieve a 70 percent reduction in building energy by 2030 compared to 2006.
- Invested in green building and energy efficiency projects for public buildings and low-income properties.
- Expanded its fleet of hybrid, all-electric and alternative-fuel vehicles, which produce fewer emissions and cut fuel consumption.
- Adopted landmark legislation to end the burning of coal for power generation at the TransAlta power plant, which will lead to large reductions in carbon dioxide and other harmful gases.

These are important steps to reduce the primary cause of ocean acidification, but much more work is needed to protect Washington's resources from this threat.

RESOURCES

Ocean Acidification: From Knowledge to Action - Washington State's Strategic Response (Blue Ribbon Panel Report): <https://fortress.wa.gov/ecy/publications/publications/1201015.pdf>

Ecology's ocean acidification website: <http://www.ecy.wa.gov/water/marine/oceanacidification.html>

The Governor's proposed budget for ocean acidification: <https://fortress.wa.gov/ecy/publications/publications/1201018.pdf>

Washington State Blue Ribbon Panel on Ocean Acidification. <http://www.ecy.wa.gov/water/marine/oa/2012panel.html>

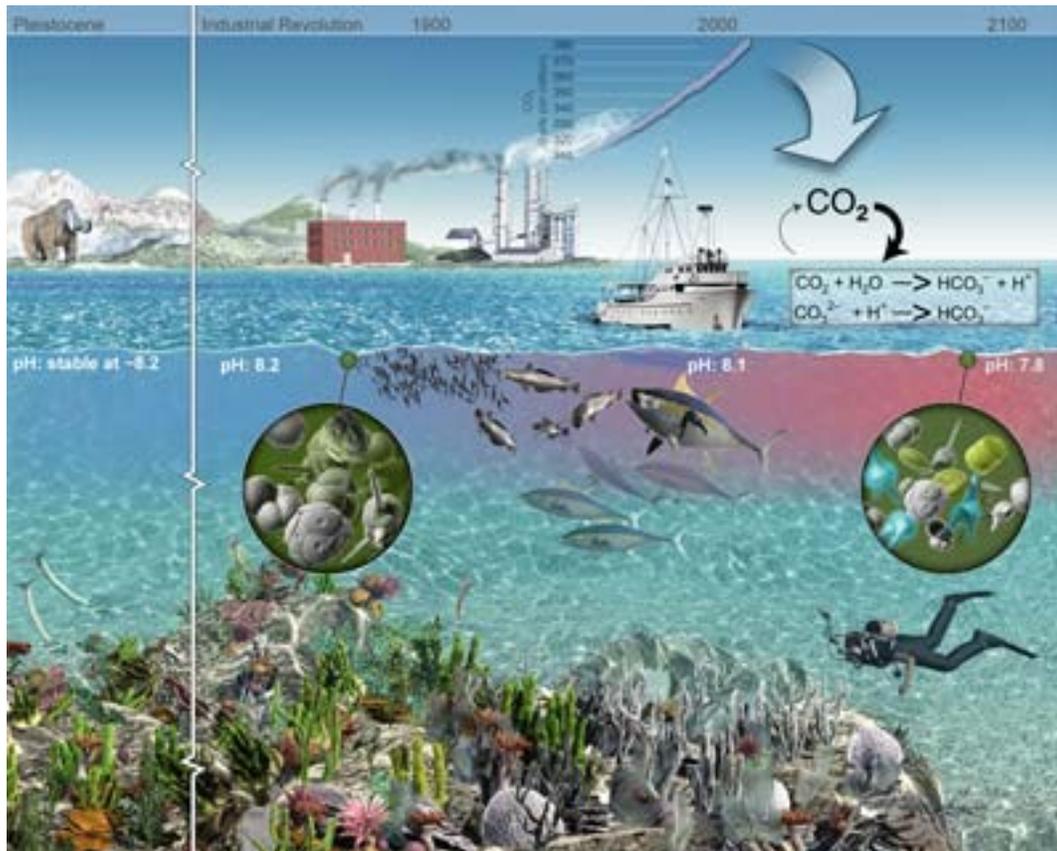
Scientific Summary of Ocean Acidification in Washington State Marine Waters: by Washington State Blue Ribbon Panel on Ocean Acidification <https://fortress.wa.gov/ecy/publications/publications/1201016.pdf>

NOAA's Pacific Marine Environmental Laboratory in Seattle conducts research on acidification in Puget Sound. See <http://www.pmel.noaa.gov/co2/> for more information.

WORLDWATCH REPORT 174 Oceans in Peril: Protecting Marine Biodiversity by Michelle Allsopp, Richard Page, Paul Johnston and David Santillo. 2007 Available online at: <http://www.worldwatch.org/bookstore/publication/worldwatch-report-174-oceans-peril-protecting-marine-biodiversity>

Choking Oceans complete 'deadly trio' for marine life. by Fred Pearce. New Scientist, 12th October 2013, p.15. also online <http://www.newscientist.com/article/dn24351-the-oceans-are-heating-acidifying-and-choking.html>

Sea Change: The Pacific in Peril, *The Seattle Times*, apps.seattletimes.com/reports/sea-change/2013/sep/11/pacific-ocean-perilous-turn-overview/



*Illustration of the principles involved in ocean acidification,
David Fierstein © 2007 MBARI, www.mbari.org/highCO2*

*“It is a curious situation that the sea,
from which life first arose, should now be
threatened by the activities of one form
of that life. But the sea, though changed
in a sinister way, will continue to exist:
the threat is rather to life itself.”*

– Rachel Carson

Unit Meetings

(Unit meeting times and locations subject to change; please verify with unit leader.)

Unit Leader email	Phone	Time	Location
Monday, November 11			
FIRST HILL – Joan Lawson			
joanvlawson@gmail.com	206-382-3147	10:00 a.m.	Horizon House, Forum & Social Room 900 University St, Seattle

SOUTHEND - Marian Wolfe and Vivian Montoya			
hedgwolfe@aol.com	206-763-9430	7:30 p.m.	Hostess: Vivian Montoya
montoyaviv@yahoo.com	206-695-2620		4932 42nd Ave S, Seattle

CAPITOL HILL/MONTLAKE			
	206-329-4848	7:15 p.m.	Hostess: Linnea Hirst 1602 E McGraw, Seattle 206-322-3076

Tuesday, November 12			
WEST SEATTLE – Amanda Berry and Ethel Williams			
amandamberry@earthlink.net	206-724-7518	1:00 p.m.	The Kenney
etheljw1@q.com	206-932-7887		7125 Fautleroy Way SW, Seattle

SOUTHEAST KING COUNTY/ENUMCLAW - Cathy Dormaier			
clcathy@skynetbb.com	360-802-6799	11:30 a.m.	Frankie's Pizza (across from Safeway) Highway 410, Enumclaw

Wednesday, November 13			
VIEW RIDGE – Gail Winberg			
winbergeng@q.com	206-524-7801	12:45 p.m.	Brig Bldg. (6344) in Magnuson Park 7400 Sand Point Way, Seattle

Directions: Go into the Park through North entrance at 74th and drive EAST toward water. At the STOP sign, turn LEFT to park in front of the Brig, or RIGHT, for more parking.

QUEEN ANNE/MAGNOLIA/BALLARD EVENING - Teddy Geokezas			
tgeoekzas@msn.com	206-782-5036	7:30 p.m.	Hostess: Elsie Simon 2554 30th Ave W, Seattle 206-283-6297

(Unit meeting times and locations subject to change; please verify with unit leader.)

Unit Leader email	Phone	Time	Location
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Thursday, November 14

ISSAQUAH DAY – Margaret Austin

margaret.austin@comcast.net	425-392-5760	10:00 a.m.	ECHO room, Issaquah City Hall 130 E Sunset Way, Issaquah
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UNIVERSITY HOUSE/WALLINGFORD – Alice Chew

achoo92@q.com	206-547-5395	10:00 a.m.	University House, Auditorium 4400 Stone Way N, Seattle
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NORTH CENTRAL – Jan Orlando

orlanre@aol.com	206-524-0936	7:30 p.m.	Hostess: Edith Miller 6902 32nd Ave NW, Seattle 206-784-3619
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Friday, November 15

BELLEVUE/KIRKLAND/REDMOND - Bonnie Rimawi

bonnierim@aol.com	425-820-7127	12:00 p.m.	The Bellevue Library 1111 110th Ave NE, Bellevue
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Saturday, November 16

BALLARD/MAGNOLIA/QUEEN ANNE DAY – Joan Peterson

joanmepeterson@gmail.com	206-789-7447	10:00 a.m.	Hostess: Joan Peterson 6537 Dibble Ave NW, Seattle 206-789-7447
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Wednesday, November 20

NORTH KING COUNTY – Toni Potter

antoniapotter@comcast.net	206-365-8949	9:15 a.m.	Third Place Commons Meeting Room 17171 Bothell Way NE, Lake Forest Park
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SOUTHWEST KING COUNTY – Mary Ehlers and Kathy Jorgensen

maryehlers@comcast.net	253-941-1930	7:00 p.m.	Foundation House
kjorgensen@juno.com	253-859-8349		32290 1st Ave S, Federal Way

Board & Committee Contacts

Term Executive Committee

2013-15	<i>President</i>	Ellen Barton	206-329-4848	president@seattlelwv.org
2013-15	<i>1st VP-Action</i>	Janet Winans	206-323-4825	janetwinans@earthlink.net
2012-14	<i>2nd VP-Program</i>	Beatrice Crane	206-783-8485	bscrane@comcast.net
2013-15	<i>Secretary</i>	Amanda Clark	206-236-0517	amandac5@comcast.net
2013-14	<i>Treasurer</i>	Cindy Piennett	206-329-4848	cindypiennett@gmail.com

Term Directors

2012-14	<i>Voter Editor</i>	Marge Baker	206-535-7299	votereditor@seattlelwv.org
2012-14	<i>Program</i>	Carol Burton	206-691-1298	ctburton7@gmail.com
2013-15	<i>Voter Services</i>	Joanna Cullen	206-329-8514	jfoxcullen@gmail.com
2013-15	<i>Social Justice</i>	Jayne Freitag	425-922-9501	mjafreitag@comcast.net
2012-14	<i>Membership</i>	Susan K. Jones	206-725-2902	susan@monckjones.com
2012-14	<i>Voter Services</i>	Julie Anne Kempf	206-329-4848	julie@kempf.com
2013-15	<i>Outreach</i>	Marianne Scholl	206-329-4848	outreach@seattlelwv.org
2012-14	<i>Unit Coordinator</i>	Lindsay Soyer	406-546-9314	lindsaysoyer@gmail.com
2012-14	<i>Development</i>	Lisa Unsoeld-Chang	206-329-4848	lisac@seattlelwv.org
2012-14	<i>Outreach</i>	Mary Jo Vigil	206-318-6939	mjvigil@starbucks.com

Note: All board members listed above, with the exception of the Treasurer, are also members of the Education Fund Board

Term Education Fund Officers

2013-14	<i>President</i>	Ellen Barton	206-329-4848	president@seattlelwv.org
2013-14	<i>1st VP</i>	Lisa Unsoeld-Chang	206-329-4848	lisac@seattlelwv.org
2013-15	<i>Secretary</i>	Amanda Clark	206-236-0517	amandac5@comcast.net
2013-15	<i>Treasurer</i>	Ginna Owens	206-215-1408	ginnao@earthlink.net
2013-14	<i>Director</i>	Pat McCann	206-878-2799	thomaspa@centurylink.net

Term Nominating Committee

2013-14	<i>Chair</i>	Judy Bevington	206-329-4848	judybevington@q.com
2013-14		Judith Hance	206-329-4848	judithhance2@gmail.com
2013-14		Cynthia Howe	206-329-4848	howe.john@comcast.net
2013-14		Lisa Peterson	206-329-4848	

Note: Two members of the board will be appointed to serve on the nominating committee when meetings begin.

Off Board Positions

Campaign Finance	Jean Carlson	206-774-6649	jean.carlson@att.net
KC South Liaison	Mary Ehlers	253-941-1930	maryehlers@comcast.net
CIS Coordinator	Cynthia Howe	206-236-0593	howe.john@comcast.net
Observer Corps	Pat McCann	206-878-2799	thomaspa@centurylink.net

Committees

<i>Economics & Taxation</i>	Jeanette Johnson		jeanettejohnson10@msn.com
<i>Education</i>	Joanna Cullen	206-329-8514	jfoxcullen@gmail.com
<i>International Relations</i>	see page 7		
<i>Social Justice</i>	Jayne Freitag	425-922-9501	mjafreitag@comcast.net
<i>Transportation</i>	Janet Winans	206-323-4825	janetwinans@earthlink.net

The League of Women Voters of Seattle-King County
1620 18th Ave, Suite 101
Seattle WA 98122

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Call the League office at (206) 329-4848 or
email info@seattlelwv.org

LWV SEATTLE-KING COUNTY:

The Other Side of Carbon Emissions:
Ocean Acidification and the Salish Sea

Fall Luncheon

Saturday, Nov. 9

11:30 a.m. to 1:30 p.m.

Downstairs at Town Hall

1119 8th Ave, Seattle

Cost: \$55 - proceeds raised support the
LWVS-KC Education Fund, a 501c3 organization

featured speaker:

*Terrie Klinger, Barer Professor of
Sustainability Science, UW School of
Marine and Environmental Affairs and
Co-Director of the UW Center on Ocean
Acidification*