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Center for Coastal Physical Oceanography, Old Dominion University

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CCPO CIRCULATION

VOL. 22, NO. 3 | SUMMER 2017

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Photo Credit: Walker Smith

Graduate School Reflections: Brynn Davis

I am now an alumna of ODU's OEAS department with my Master's Degree in Ocean and Earth Sciences! Class of 2016. Whoopee!!! Any regrets? Not a single one. Any stresses? Yes. PLENTY. Countless nights up till 2 am, endless studying, early mornings at 5, homework on homework on homework, Matlab problems that make you want to throw your computer out the window only to realize you forgot a stupid semicolon, tests, grading papers, and experiencing that research is not a linear trend but more like a roller coaster with many dead ends, loops, and twists. But I'm not complaining. All of that is part of the "Graduate School Package" so I'm not looking for any sympathy. Looking back now, everything seems so faint. All worth it nonetheless. I feel I am one of the luckier graduate students that came out of ODU's oceanography program because I was a CCPO student. Working at CCPO has presented me with opportunities that other graduate students within the department did not have. It has exposed me to the stresses, victories, and day to day life that some research scientists experience everyday. I was able to work with some of the most brilliant scientists in the physical oceanography field. One of the most important components: I was able to work in a quiet and safe building. That sense of security of being able to walk down the hallway and not worry about someone stealing my computer out of my office was tremendous. Plus, I got to work with some of the most generous and kindhearted people in the whole world!!!

Friendships that will last for a long time! Some of the highlights that came from working at CCPO,

just to name a few: I was able to present my research at the 2014 and 2016 Ocean Sciences Meetings in Honolulu, Hawaii and New Orleans, Louisiana, respectively, both as an undergraduate and graduate student. I was awarded the opportunity to present my research in a formal yet informal ambiance, talk with other graduate students about their projects from around the world, and meet some of the top dog research scientists in my field that prior to the meeting, I had only read about in books and journals! Even better, some of those top dogs said that my research was really great and they couldn't wait to see the finished product (publication on the way)! I also became a coauthor on a really nice paper published in *Polar Biology* with Andrea Piñones, **Mike Dinniman**, and **Eileen Hofmann** highlighting the Lagrangian particle trajectories of Antarctic krill and crystal krill larvae in the Ross Sea, Antarctica. I also volunteered in many outreach and education programs with **Eileen Hofmann**, **John Klinck**, and **Julie Morgan** in which we taught middle school students the importance of the Chesapeake Bay watershed. I am beyond grateful for all of these experiences. I would have to say though, the absolute highlight was going on the U.S. Antarctic Marine Living Resources (AMLR) research cruise in August of 2016 for a whole month to work as a zooplankton technician under Dr. Christian Reiss, an ODU OEAS alumnus, conducting the krill stock assessments around the South

Shetland Islands for the U.S. contribution to the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR).

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OLD DOMINION UNIVERSITY

Center for Coastal Physical Oceanography

IDEA FUSION

One of the “products” from CCPO is a graduate student who graduates. This newsletter focuses on two recent graduates, Brynn and Jim. I forget the exact process by which I left graduate school, it being quite a while ago, so it is interesting to see the non-linear path taken by these two students.

Letter from the Director:

John Klinck

Professor & CCPO Director

There seem to be two parts to their stories: the plan and the path. At every moment working towards an academic degree, we plan what we are trying to do. This includes which university, which classes, which advisor, which project, and so forth. However, we don't always follow our own plan. Sometimes we are not allowed to complete the plan because classes are canceled or people retire or move, or project funding terminates. Sometimes we see a better opportunity in a different direction, so we change our plan.

I have always felt that we make our way through life with a mixture of persistence and flexibility. We cannot change our mind at every step, but equally, we cannot pursue inflexibly a goal that is becoming increasingly unreachable or unproductive. An important aspect of being involved in education in a research university is to maintain flexibility and to offer good advice to students. CCPO does not graduate many students, but a steady stream of graduates is finding its way to a research career.

Graduate School Reflections: Brynn Davis, cont'd.

Photo Credit: Brynn Davis



After studying krill and Antarctic silverfish for three years, I was beyond ecstatic for the opportunity to actually go and experience the Antarctic and physically touch the critters I had been researching for so long.

I don't even know where to start or how to begin explaining how amazing this opportunity was. This is by far the most spectacular thing that has ever happened to me! Sometimes (always) it's difficult to actually explain how amazing Antarctica is to friends and family. It was surreal riding in the *RVIB Nathaniel B. Palmer* alongside the continent witnessing places that no man has ever stepped foot on! The crew, the scientists, the sights, the food, and the science.

I wouldn't change any part of it. I have absolutely no complaints. My employment title was “Junior Biological Fish & Zooplankton Technician 1” and I worked the 2 am to 2 pm shift. The shifts were long (12 hours each), but they seemed to only last five minutes. When they first assigned me to the night shift, I was a little skeptical about becoming nocturnal for a month. It only took me two days to adjust and now looking back, that was the best shift! The krill tows caught during the night shift were far larger than the daytime tows, the seals seemed to interact with the ship more at night (they would swim right

next to the stern where we were standing), AND I got to see the sunrise every single day!!! Holy smokes!! There are no words to explain that beauty!!

As a zooplankton technician, my duties were to help deploy current drifters, XBT's, the Isaac-Kidd Midwater Trawl (IKMT Net), and to help count and process the tows. After we retrieved the net, which was sometimes stressful to avoid capturing any sea ice, (it could damage and tear the net.... which it did.... good thing we brought two nets), we brought our sample back into the lab and the technicians, with our counting clickers in hand, went to work!

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The PhD Trail: James (Jim) Haluska

My path to a PhD in Oceanography has been long and to a certain extent convoluted. By convoluted, I mean it's impossible to know where you will end up 65 years later (I started counting from when I was 4 years old).

After receiving a BA in Chemistry in 1965, I realized that at the Bachelor's level, all I would be is a bench chemist. After a side track as a postman at the West Point Military Academy, I was persuaded by my parents to reach a little higher than postman. I wanted to be in a more applied field of science, so I decided to go with oceanography. The only thing I can point to here is that I grew up overlooking the Mid-Hudson River and knew there was more to an estuary than the rise and fall of the tide.

I was accepted in the ODU Oceanography program and I received my Master's in Oceanography from ODU in 1975. The last several years at ODU, I also worked at the Norfolk District, Army Corps of Engineers. The temporary position turned into a full-time oceanographer position with the Corps after I graduated. For the next six years I researched and wrote environmental impact assessments and statements for water resource projects in Virginia. Looking back, a major project for which I was both project manager and the environmental impact statement author was probably the most interesting. This was a flood control canal in Virginia Beach. It included the construction of ten acres of salt marsh in the industrial park area of the project. This was in the early 90s and was possibly the first example of

salt marsh creation in Eastern Virginia. After it became evident that I had topped out at the Corps, I transferred to a chemist position at the Norfolk Naval Shipyard's Industrial Laboratory. For the last two of my six years there, I helped design, manage the installation, and manage the operation of a laboratory information management system for the industrial laboratory. In



James Haluska (left) and **Dr. Klinck** (right) pictured at the May 2017 graduation

a quest for a better salary, I transferred again to what was then the Atlantic Division, Naval Facilities Engineering Command in Norfolk. I was there for 13 years and worked on a variety of environmental studies for pier replacements, a training ship mooring for the Navy Special Forces, the standup of a V22 squadron at Cherry Point, NC, and, near the end of my 13 years there, an attempt to finish the environmental work on an underwater training range off the NC coast. I might add here that the NC coast underwater training range is still not built.

My final government job was at the Operational Test and Evaluation Force also in Norfolk. For about 6 years I was an operational test director

for chemical and biological defense equipment test projects. Well, someone has to do it! I spent a lot of time in the middle of Utah testing sensors and other equipment. I did learn a lot about Lake Bonneville in the process. I retired from the Federal Service in 2009 after approximately 36 years of service. I mention this because being retired, in essence makes me a funded

for life scientist. What better way to improve my science credentials than to go back to ODU and work on earning a PhD?

So I started in 2011 with my coursework. I still remember a conversation with Dr. Fred Dobbs about retaking courses I took for my Master's in the early 70s. I was told that since I got my Master's, the mid-Atlantic Ridge was discovered (among other things). A compelling argument.

At the point where my coursework was done, I embarked on the process of preparing and getting my dissertation prospectus approved. My prospectus committee was **Dr. John Klinck** as the CPO (Chief Prospectus Officer), Dr. Dick Zimmerman, **Dr. Tal Ezer**, and Dr. Gangfeng Ma. My chosen area of research was eleven barrier islands and associated inlets on Virginia's Delmarva Peninsula's Eastern Shore. The Prospectus was approved in early 2014. Even though a lot of time and thought went into the prospectus, I have learned that a prospectus is only a preliminary guide and a good indicator of how science works.

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CCPO Science Education Outreach - Partnering with a Local School to Promote Marine Stewardship

Dr. Eileen Hofmann & Julie Morgan



An interested student and Dr. Hofmann looking at snails, clams and barnacles in the touch tank. Photo credit: Carey Averill, St. John the Apostle Catholic School.

During this academic year, students from pre-K to eighth grade at St. John the Apostle Catholic School in Virginia Beach studied aspects of oceanography through a variety of approaches and projects as part of a school-wide STREAM (science, technology, religion, engineering, art and math) program. The STREAM focus on oceanography resulted from discussions between CCPO staff and faculty and the principal (Miriam Cotton) and teachers (Carey Averill and Terri Brodeur, STREAM Coordinators) from St. John the Apostle Catholic School.

In mid-May, St. John the Apostle Catholic School held a STREAM Expo as a final event in the year-long program. The Expo highlighted projects the students had done throughout the school year, such as a floor-to-ceiling mural in the main hallway of marine creatures created by children

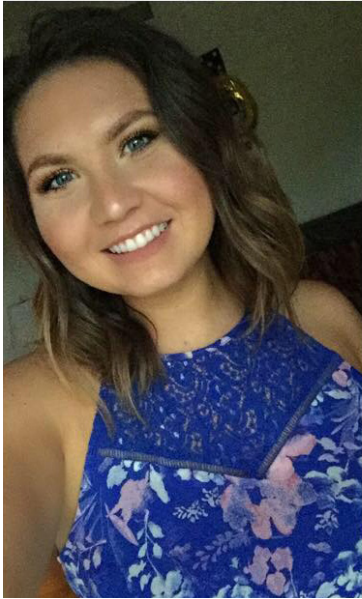
from pre-K to second grade and a mock city council meeting in which seventh grade students took on roles of people advocating for improved environmental efforts.

As part of the STREAM Expo, CCPO graduate students (**Ali Burgos, Praveen Kumar**), staff (**Julie Morgan**), researchers (**Mike Dinniman, Pierre St. Laurent**) and faculty (**John Klinck, Eileen Hofmann**) set up several hands-on stations in the school gym that provided learning activities, with a focus on Chesapeake Bay. The hands-on activities reinforced some of the concepts and ideas that the children had been exposed to as part of STREAM activities during the school year. Throughout the morning and early afternoon, children in pre-K to eighth grade tried each activity as they rotated through the stations, and had time to go back to the ones that were the most interesting to them.

The children were introduced to the Chesapeake Bay watershed and its connection to their daily lives through demonstrations done by **Ali** with a watershed model table. Differences in salinity throughout the Bay were demonstrated by **Praveen** and **Pierre**, who helped the children use refractometers to measure salinity and place the results on a map of Chesapeake Bay. The virtual model of Chesapeake Bay that **Mike** set up was a popular station because the children could change inputs to the model to produce big events, such as flooding of Norfolk. Sand sorting was also a hit and **John** kept sand from getting all over the gym while explaining the importance of grain size. **Julie** used shells and animal models to introduce some of the creatures that live in the Bay and in the ocean. The touch tank with live animals, such as oysters, clams, snails and barnacles, kept everyone's attention; the snails were very popular (*inset*). The final event for the STREAM Expo was a presentation to the school by **Eileen** about Antarctic research and an oceanographic cruise to Antarctica.

Activities like the STREAM Expo are always fun but also challenging. Informal science education events require us to learn how to communicate our science in ways that are understandable to nonscientists and children. Also, the interesting and sometimes difficult questions we get make us think about how to explain what we do in ways that differ from our normal approaches. At the end of these events we want the participants to regard science as fun and understand that it is an important part of their daily life. The cards and letters we received from the students after the STREAM Expo indicate their level of enthusiasm and passion for caring about the marine environment.

CCPO Spotlight: Taylor Fernow



I am currently working as a Junior Systems Administrator at CCPO with **Sean O'Brien**.

Right now I am a senior at Old Dominion University and am studying Information Systems and Technology. Working at CCPO was my first job opportunity in IT and I have already learned so much while being here the last nine months. I have done a lot of different things like setting up and building work stations,

purchasing IT equipment, building websites, documenting everything and putting it into our intranet site, organizing and getting rid of old equipment, and much more!

My first project was given to me at the beginning of this year and it involved me purchasing three \$35 Raspberry Pi computers to make a monitoring system for Sean's office. I made the purchase and within a week we were setting up conky (system monitoring software) on to the Raspberry Pi which we named *elderberry*. With this system monitoring software we are able to monitor our entire system by just looking at the screen and if anything goes wrong we can know exactly where, in real time. Stop by and look at it in Sean's office! So far Sean loves it and it is very helpful for us in the systems department. This summer Sean and I plan to build a storage server for CCPO which is the next big project we have ahead of us!

Once I graduate, I hope to have a job lined up, and plan to work, learn and grow as an IT professional and be the best I can for my users. I get asked almost everyday what I want to specialize in and I am still not quite sure but I am glad that CCPO has given me the opportunity to "dip my toes" into many different projects so I can explore various options!

Photo Credit: Brynn Davis

Graduate School Reflections: Brynn Davis, cont'd.

There were roughly five of us at any given time working in the zooplankton lab and our job was to count and identify any and all zooplankton in the sample. Half of the team would concentrate on the krill and the other half would concentrate on the other types of zooplankton. We saw all different species of fish larvae, amphipods (alien-like crustaceans), jellyfish, salps, giant copepods, polychaetes (worms), gastropods, and many types of zooplankton that have yet to be identified. By the time we were finished processing one tow (~1.5 hours), we had arrived at our next station. Whether you were awake or asleep, everyone on the ship knew we had arrived at a sampling station because the sound of the bow thrusters that kept the *N.B. Palmer* on station detonated through the entire ship. You could not escape that sound even if you were asleep on the 5th floor. Needless to say, there were very few undisturbed slumbers. If you couldn't sleep, you could always get up and walk around because 24 hours a day on the ship, there were people working. That makes sense since it costs \$40,000 per day to run the ship. You don't want to waste one single minute!

During the down time, there was plenty to do to keep occupied. The *N.B. Palmer* encompasses lots of amenities



including a gym, a sauna, 15 sq. ft. New York Times crossword puzzles, a ping-pong table, the mess hall (where you can always find food no matter the time of day), and the 02 lounge - which was filled with books, couches, recliners, a foosball table, and thousands and thousands of movies. If none of those options tickled your fancy, you could always walk outside the ship or hang out in the bridge to take in the remarkable sights, my personal favorite.

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JUST THE FACTS

Awards & Other Mentions:

During the annual College of Sciences' Faculty and Staff Achievement Awards Ceremony on April 25, **Tal Ezer** received the 2017 Distinguished Research Award.

Bob Tuleya, a member of the Industrial and Professional Advisory Council (IPAC) of the Penn State College of Engineering (Aerospace Engineering Department), participated in the annual meeting of the Council on March 22 & 23, 2017.

Publications:

Bidegain, G., E.N. Powell, **J.M. Klinck**, **E.E. Hofmann**, T. Ben-Horin, D. Bushek, S.E. Ford, D.M. Munroe, and X. Guo, Modeling the Transmission of *Perkinsus marinus* in the Eastern oyster *Crassostrea virginica*, *Fisheries Research*, 186, 82-93 doi: 10.1016/j.fishres.2016.08.006, 2017.

Cheng, Y., J. Tournadre, X. Li, Q. Xu, and B. Chapro, Impacts of Oil spills on Altimeter Waveforms and Radar Backscatter Cross Section, *Journal of Geophysical Research Oceans*, 122, doi:10.1002/2016JC012568, 2017.

Ezer, T., A Modeling Study of the Role that Bottom Topography Plays in Gulf Stream Dynamics and in Influencing the Tilt of Mean Sea Level Along the U.S. East Coast, *Ocean Dynamics*, 67(5), 651-664, doi: 10.1007/s10236-017-1052-5, 2017.

Ezer, T. and **L. P. Atkinson**, On the Predictability of High Water Level Along the U.S. East Coast: Can the Florida Current Measurement be an Indicator for Flooding Caused by Remote Forcing?, *Ocean Dynamics*, 67(6), 751-766, doi: 10.1007/s10236-017-1057-0, 2017.

Lawson, G., M. Sosonkina, **T. Ezer**, and Y. Shen, Empirical Mode Decomposition for Modeling of Parallel Applications on Intel Xeon Phi Processors, Proc., 2nd International Workshop on Theoretical Approaches to Performance Evaluation, Modeling and Simulation, *IEEE/ACM CCGRID Publ.*, 2017.

Lawson, G., M. Sosonkina, **T. Ezer**, and Y. Shen, Applying EMD/HHT Analysis to Power Traces of Applications Executed on Systems with Intel Xeon Phi, *International Journal of High Performance Computing Application*, in press, 2017.

Kaufman, D.E., M.A.M. Friedrichs, W.O. Smith, Jr., **E.E. Hofmann**, **M.S. Dinniman**, and J.C.P. Hemmings, Climate Change Impacts on Southern Ross Sea Phytoplankton Composition, Productivity and Export, *Journal of Geophysical Research*, 122, 2339-2359, doi:10.1002/2016JC012514, 2017.

Kuykendall, K.M. E.N. Powell, **J.M. Klinck**, P.T. Moreno, and R.T. Leaf, Management Strategy Evaluation for the Atlantic Surfclam (*Spisula solidissima*) Using a Spatially Explicit, Vessel-Based Fisheries Model, *Fishery Bulletin*, 115, 300-325. doi: 10.7755/FB.115.3.3, 2017.

Presentations:

Dinniman, M., **E. Hofmann**, **J. Klinck**, **S. Mack**, and **P. St-Laurent**, "How the Cryosphere May Affect Iron Supply to Antarctic Phytoplankton Blooms," Southern Ocean Workshop, Boulder, CO, April 2017.

Ezer, T., "The Gulf Stream's Influence on Sea Level Along the U.S. East Coast," South Florida Water Management District, West Palm Beach, FL, May 9, 2017.

Ezer, T., "The Gulf Stream and Sea Level Rise," Unitarian Church of Norfolk, Norfolk, VA, March 3, 2017.

Ezer, T., "Climate Change, Sea Level Rise and Impacts on the Hampton Roads Region," Hampton University Atmospheric and Planetary Sciences Seminar, Hampton, VA, January 18, 2017.

Klinck, J.M., **M.S. Dinniman**, **E.E. Hofmann**, and W.O. Smith, Jr., "Effects of Projected Changes in Wind, Atmospheric Temperature and Freshwater Inflow on the Ross Sea," Southern Ocean Workshop, Boulder, CO, April 2017.

St-Laurent, P., "Physical Drivers of the Highly-Productive Amundsen Sea Polynya (Antarctica)," Invited seminar for the 2017 OEAS Seminar Series, Old Dominion University, Norfolk, VA, April 6, 2017.

Oliver, H., **P. St-Laurent**, R.M. Sherrell and P.L. Yager, "What Makes a Bloom in the Amundsen Sea Polynya? A 1-D Biogeochemical Modeling Perspective," Poster presentation at the Gordon Research Conference on Polar Marine Science, Ventura, CA, March 26-31, 2017.

Padman, L., F. Paolo, J. Feldman, **M.S. Dinniman**, H.A. Fricker, S.L. Howard, A. Levermann, and S. Springer, "Sensitivity of Ross Ice Shelf, Antarctica, to Changing Climate," 14th Conference on Polar Meteorology and Oceanography, Seattle, WA, January 2017.

Pan, C., **M.S. Dinniman**, P.J. Fitzpatrick, Y. Lau, **E.E. Hofmann**, and J.D. Wiggert, "Impact of High Resolution Forcing on Circulation Variability Within a Regional Model of the Mississippi Sound and Bight," Gulf of Mexico Oil Spill and Ecosystem Science Conference 2017, New Orleans, LA, February 2017.

Wiggert, J.D., **M.S. Dinniman**, P.J. Fitzpatrick, Y. Lau, C. Pan, and **E.E. Hofmann**, "Circulation, Transport and Exchange Variability in the Northern Gulf of Mexico Continental Shelf," Gulf of Mexico Oil Spill and Ecosystem Science Conference 2017, New Orleans, LA, February 2017.

Yager, P.L., **P. St-Laurent**, R.M. Sherrell, H. Oliver, **M. Dinniman**, **E. Hofmann**, and S.E. Stammerjohn, "Melting Ice Sheet Enhances Coastal Biological Productivity," 2017 ASLO Meeting, Honolulu, HI, February 2017.

Updyke, T. G., "A Study of HF Radar Outages in the Mid-Atlantic," Radio-wave Operators Working Group Conference, Galveston, TX, March 2017.

Graduate School Reflections: Brynn Davis, cont'd.



Dr. Klinck (left), Brynn Davis (center), and Dr. Hofmann (right) pictured at the December 2016 commencement

My ODU OEAS graduate career finished this past December of 2016 with the successful passing of my Master's thesis defense - a presentation that took place in "The Cave" on November 11th in front of my friends, family, ODU department faculty, committee members, and some of my 106 students. A large crowd filled in the lecture hall and joined via Skype that Friday afternoon to hear about the krill and silverfish that I had been studying the last three years at ODU.

I had practiced for many weeks prior and felt confident that morning. At 1:00 pm, it was time to begin. **Dr. Hofmann** stood up front, welcomed everyone, and began to talk about my success and accomplishments as a graduate student while working under her wing. Hearing **Dr. Hofmann** talk about me like that in front of everyone was so special. She made me feel like a rock star, like I was just about to receive a Nobel Peace Prize. I really appreciated her kind words, they made all my jitters go away. She then welcomed me up to the podium. The next thing I remember, I was done and answering questions the best way I knew how. I hardly remember talking, it went by so fast! It was definitely an out-of-body experience. My brain and mouth just went into robot mode reciting from muscle memory. A couple comments were made from the crowd about their appreciation of my enthusiasm during the presentation. I felt like I had to put my little "Brynn Touch" on the presentation or else the crowd might get bored.

The next things on the "To Do List" were to finish the edits of my thesis from my committee members, submit my finalized thesis to the school, and then graduate on December 17th!!! Graduation was a cold day, but I have earned a beautiful piece of paper representing hard work and dedication hanging on my wall!

Thank you so much to all the staff, graduate students, and professors at CCPO for making my graduate school experience wonderful. I am beyond grateful for everything that you all have done for me. I am grateful for the friendships that I have made. I am grateful for everything that I have learned. I am most grateful for all the opportunities that you have given me. I am forever in your debt. Next stop, thesis publication!



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The PhD Trail: James (Jim) Haluska, cont'd.

It shows the inability to predict accurately the course of subsequent research and findings. Predicting the future has always been a problem. One example can be taken from my research. There are general rules or beliefs on how barrier islands should behave, but when the data is collected, it shows there can be much departure from what is “generally understood”.

I formed a Dissertation Committee in July of 2014. **Dr. John Klinck** was my Chairman and **Dr. Tal Ezer**, Dr. Rich Whittecar, and Dr. Gangfeng Ma were the Committee Members. It soon became evident in my data analysis process that the amount of data I was generating required methods that would consolidate and find commonalities for the eleven islands and ten inlets I was studying.

The dissertation reflects this issue by describing the overall results and the changes to individual islands. I defended the dissertation in April 2017.

I have seen several references to a Doctorate as a terminal degree. After going through the process, I think this is incorrect. A Doctorate is actually a starter degree in that the recipient's approach to data, scientific reasoning, and presentation of results is evaluated and reworked to orient research findings to an objective level that is devoid of personal opinion and bias to the extent possible. I am grateful to all who helped me along the way and hope I can make contributions to the scientific advancement that are both interesting and of value.