The Pacific Ocean doesn’t show signs of anything that looks like the whipper El Niño of 1997-98, according to the latest information from the JPL-managed U.S-French ocean-observing satellite Topex/Poseidon.

The data do show that the mid-equatorial Pacific Ocean has slowly warmed by about 1 degree Celsius (1.8 degrees Fahrenheit) above normal in the past few months. However, the Pacific continues to be dominated by the larger-than-El Niño/La Niña pattern called the Pacific Decadal Oscillation, which may discourage El Niño development. The image is available online at http://www.jpl.nasa.gov/images/earth/pacificocean.

As summer starts, next El Niño is slow to grow

By Rosemary Sullivan


The ocean warming in the past month can be explained by a relaxation in the equatorial trade winds observed by the JPL-managed Quik Scatterometer (QuikScat) satellite, which measures ocean wind speed and direction. These winds usually blow from the Americas toward Asia, helping push warm water eastward. “For the first two weeks of June, these winds were unusually weak,” said QuikScat Project Scientist Dr. Timothy Liu. “But by last week, they had returned to normal. If the weakening continued or intensified, we could have been expecting an El Niño to develop by early fall.”

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Data taken by Topex/ Poseidon show the Detering Sea, Gulf of Alaska and U.S. West Coast, where lower-than-normal sea-surface levels (blue areas) and cool ocean temperatures continue. The blue areas are between 2 and 5 inches below normal, and the purple areas range from 6 to 7 inches below normal.


The Topex/Poseidon and follow-on Jason 1 missions are managed by JPL for NASA’s Earth Science Enterprise, dedicated to understanding the total Earth system and the effects of natural and human-induced changes on the global environment.


Caltech, JPL honored by United Way
Caltech and JPL have received the United Way’s Community Landmark Award for the 2001–02 fundraising campaign conducted last fall.

The United Way of Greater Los Angeles chapter honored the campus and Laboratory at ceremonies last month. The organization said it was “honored to have such a diverse collection of visionary companies that have found United Way of Greater Los Angeles to be a friend and as a source of the opinions and hope for the community.” The award is given, United Way said, “to an organization that has demonstrated a true commitment to the United Way fundraising campaign and has championed the belief that United Way is the way America cares about community.

JPL staff said Tom SCHMIDT, assistant vice president for Human Resources Administration at Caltech, and members of the Caltech community are pleased that the United Way would single out Caltech, JPL, for ‘the award and are only hopeful that we can continue to be as significant or more so in the future as we have been in the past.’

NASA Internet sites honored
Two NASA Internet sites were honored last month with Webby Awards sponsored by the International Academy of Digital Arts and Sciences. The awards recognize Web sites that are both aesthetically exceptional and which utilize technology to help build communities.

One of the awards, the People’s Voice Award for Science, was given to the Earth Observatory, an interactive site that highlights news and imagery about NASA’s Earth science research. KAREN YANG, JPL Earth Outreach theme lead, created JPL’s site which features providing significant contributions to the site.

The other award was the JPL Mars Reconnaissance Orbiter site which is responsible for spacecraft design, integration of the science instruments and the support of mission operations. The Mars Reconnaissance Orbiter spacecraft will weigh approximately 1,975 kilograms (4,355 pounds) and have a 238 by 320 kilometer orbit (200 by 153 miles) polar orbit around Mars. The spacecraft’s instruments will provide significant improvements in resolution and data volume over previous missions and are being deployed by both U.S. and international investigators. The spacecraft will also provide telecommunications and navigation support for future Mars missions.

Celebrating Heritage Week
Hundreds of Places enjoyed the final day of American Heritage Week, which was held June 10–13. At left, a Native American dancer and music participant.

Ongoing Support Groups
Alcoholics Anonymous—Meetings are available. Call the Employer Assistance Program at ext. 4-3680 for time and location.

Career Development—Anchors—Arrangements are available. Call the Employer Assistance Program at ext. 4-3680 for location.

Special Events Calendar

Thursday, July 18
JPL Stories—The Ed Stone, Voyager project scientist and former JPL directing scientist, will discuss his 30 years of experience on Mars and Wednesday July 17 at 4:30 p.m. in T150-cafeteria. For information, call the Benefits Office, ext. 4-7370.

Tuesday, July 9
JPL Stamp Club—Meeting at noon in Building 183-328.

Thursday, July 11
Contract Management—The first session of this class is part of the UCLA/Caltech/JPL Contract and Proposal Management Certificate Program begins in Cafeteria 190 from 5:30 to 8 p.m. Class continues through Sept. 12. Enrollment tonight. For more information, call the Employer Assistance Program at ext. 4-3680.

Monday, July 15
“Large-Odyssey: Why We Could Not Fail”—Mars Odyssey Project Scientist and former JPL director Roger Gibbs, Mission Manager, will present at 4:30 p.m. in von Kármán Auditorium. Gibbs will discuss challenges the project faced during the development phase. The talk is sponsored by the Caltech Management Association. For information, contact Patricia Fraschetti at ext. 4-9694.

Tuesday, July 23
Investment Advice—A Fidelity representative will be available for one-on-one counseling at T1720-131. For an appointment, call (800) 642-7311.

Ongoing Support Groups—Alcoholics Anonymous will continue to meet in Building 183-328, Monday at 5:30 p.m. and Wednesday at 5 p.m. For information, call the Benefits Office, ext. 4-3680.
JPL researcher Adrian Stoica of Section 3445 has dedicated his career to developing technologies for this very goal. He and his six-person team of researchers have been developing and testing evolvable hardware designed to enhance the survivability and versatility of spacecraft in extreme situations.

"Evolvable hardware is a relatively new technology, born at the confluence of automated design, artificial intelligence and reconfigurable hardware," said Stoica. "It addresses hardware that changes/self-configures itself for meeting new requirements or for improving its performance. It is the only proven technique to automatically synthesize (analog) electronic circuits. Moreover, this can be done on-chip and in situ.

Evolvable hardware—the first concept of which was proposed in 1994—is based on the same idea as the evolutionary process occurring in the biological world. In a silicon chip about the size of a fingernail, robust search algorithms, called genetic algorithms, seek solutions from a vast search space within seconds. The search spans a variety of candidate solutions or circuits, which are obtained from the genetic code associated to each circuit. The circuit that satisfies the requirement is the one chosen as the first solution to fix the problem. The system then builds on itself, reconfiguring stronger solutions.

Genetic algorithms are combined with reconfigurable hardware devices to achieve reconfiguration autonomously, thereby making them self-reconfigurable, which is the next step forward from hardware that is only able to be reconfigured by a human.

"If you are operating in an environment far away," Stoica explained, "you would need the capability of finding electronic solutions to address situations that occur, without the benefit of a human designer. This is a method of getting an on-board way of solving the problem.

"In case of faults or degradation of electronic components, such is often the case with flight hardware, evolvable hardware can find new circuit topologies or chip architectural arrangements that bypass the faults or reuse the components in a different way than the original one, salvaging some part of their capabilities. This leads to a new system that is able to continue and maintain the existing functional- as the future of space exploration expands to regions more remote and more hostile than ever explored before, spacecraft of the future will have to live longer and be able to withstand the adverse conditions associated with harsher environments.

BY DEREK BLACKWAY

JPL TEAM WORKING ON WAYS TO GIVE SPACECRAFT LONGER LIFE

Stoica finds great satisfaction in working with his team. "Team spirit, although the components are not exactly the same or not in the same arrangement," Stoica said. "Before joining JPL in 1996, Stoica earned his doctorate in robot learning from Victoria University in Melbourne Australia and had been working in the field of adaptive and learning hardware since 1986. He started working in evolvable hardware when he was hired at JPL. "I got into this because I was interested in automated design," Stoica said.

Stoica's supervisor, Anil Thakoor, has been a strong supporter, acting as a lobbyist for the new technology as well as appealing to NASA and the Department of Defense: "Anil had the vision to see the opportunity of this technology at a time when there were no chips and no proofs, only some ideas," said Stoica.

"Adrian and his team get the credit for bringing evolvable hardware to JPL and making NASA and the Department of Defense aware of the technology, championing it for space applications," Thakoor said.

The team also initiated and has been organizing the main event in the field: the NASA/Department of Defense Conference on Evolvable Hardware, which this year will be held in Washington, D.C. from July 15 to 18.

The team does its experimental work in the Evolvable Systems Lab, part of JPL's Center for Integrated Space Microsystems facilities. Here the chips are put in environmental chambers in which the temperature can be altered to extreme conditions. The chips self-reconfigure to recover from degradations induced by extreme temperatures.

The team has designed and fabricated three generations of evolvable chips.

"One of the accomplished goals for our latest chip was for it to be able to rapidly perform the testing of hundreds of thousands of circuits that were evaluated in a matter of seconds, and result in an evolved/synthesized circuit solution that satisfied the imposed requirements," Stoica said. "Its an excellent result, but we realize there is a long road from laboratory proof-of-concept to the insertion of technology in space."

During this long road, Stoica focuses on small goals. "Part of what makes me happy," he said, "is the emotional reward when you solve a problem, find a solution to a previously unsolved problem, or when you know something that no one else on Earth knows. For us, that happens on a day-to-day basis. We're exploring totally new ground. Our chips allow us to do unique experiments that no one else in the world can do. We discover many things that wouldn't be possible if we didn't have these chips."

More "material" rewards for Stoica include the JPL Lew Allen Award, as well as other prizes and invitations to deliver keynote addresses and tutorials.

Stoica and his team can often be found working late nights on Lab. "I am fortunate to have a great team," Stoica said. "We are very close. We work hard together, go to conferences together, go to baseball games and ski together. This facilitates intercommunication and keeps our motivation high."

As the workload intensifies, the excitement level of the group remains consistently steady.

"We are excited about our progress, although, as happens all over the world of science, the more you know, the more questions appear, and you realize that there is still a lot of work to be done," Stoica said. "Still, I strongly believe that evolvable hardware concepts will be the very essence of all infrastructures 20 to 30 years from now, and will play an important role in enabling more survivable space hardware."

Adrian Stoica shows three generations of evolvable chips built at JPL. The smallest one, developed last year, measures about 30 square millimeters.
Classifieds will be available the day before.

http://www.epi.com

R Passings

ADREY ADAMS, 75, a retired senior photo lab technician in Section 163, died recently. Arrangements were made by JPL, no further information available.

Harold Cunnih, 81, a retired employee, Section 377, died June 1. Call the Office of Communications, 626-237-1275.

Joyce Tabash, 64, a former employee, Lab 197 and retired in 1986. She is survived by her wife, Emily, and son Harold. Arrangements were private.

Joseph Sutth, 65, a retired maintenance electrician in Section 662, died of cancer on June 8. Arrangements were private.

Jack Dunn, 70, a retired senior tech specialist in Section 357, died of lung cancer on June 12. Dunn joined JPL in 1967 and retired in 1985. He is survived by his wife, Margaret, and sons Jack Jr. and Russell.

Private burial was in Dayton, Ohio.

Letters

Thanks to the Staffing department at JPL, my partner and I are looking forward to our retirement abroad in the near future.

I will miss you all but especially all my co-workers in Human Resources whom I have worked with for over 15 years. I am looking forward to a rewarding retirement, but I will keep in touch and I wish everyone much happiness and success.

S. H. Roberts

Classifieds

For Sale


BARBER BIBS, hair cut, foot control: Kermans, $5.40 each. Contains: coarsely cut, medium, and fine hair. 626/258-3246.

BIKE, '81, 10-speed, all original, rare model, $250. 949/367-8060.

BIOGRAPH, 300 mph, salon hologram, $125. 213/333-6130.

BONE SOFA SLEEPER, makes into queen bed, sofa, loveseat, $700. 626/315-0243.

BRAND NEW, T.V. 27 inch, $150. 897-1203.

CARPET, 60 x 84, tan, $3. 626/798-9222 or 541-1340.

Couch, Windsor style chairs, sturdy, $175. 952-688-0432.

Dinette set, 6 piece, $150. 897-1203.

DINETTE SET, must go, $30. 626/577-9278.

DINING ROOM TABLE, cherry, 60", 4 chairs, $125. 626/315-0243.

DOMINOES, 2 sets. 626/315-0243.

PARK REGENCY, Park City, Utah, December 17-24, 2002, 1 bd., sleeps 4, all units have balcony, heated pool, hot tub, fireplaces, sleeps 8, available weekly or by the month. 949/786-6548.

Real Estate

CASA DEL SOL, 1 bd., 1 bath, 700 sq. ft., nice, 1st floor, no steps, kitchenette, laundry, yard, garage, parking, available immediately. $500/mon. 352-3588.

FAR WEST, 1 bd., 1 ba., house to share, furnished with kitchen, laundry, A/C, 15 min. to JPL. 626/256-0015.

MONROVIA HILLS, charming 2nd level of 3 bd., 2.5 ba., fireplace, patio, A/C, washer/dryer, refrigerator, garage. 15 min. from JPL. $541-1340.


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