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NASA Celebrates Past, Faces Unsure Future

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John Glenn was the first American in orbit

BARBARA KLEIN: This is SCIENCE IN THE NEWS in VOA Special English. I'm Barbara Klein.

BOB DOUGHTY: And I'm Bob Doughty. Today, we remember a major anniversary for the American space program. And we tell how budget cuts may affect American plans to explore the planet Mars. We also tell about efforts to organize competing uses for coastal waters. And we tell what scientists have learned about the healing powers of massage.

(MUSIC)

BARBARA KLEIN: The National Aeronautics and Space Administration celebrated a major anniversary earlier this month. It was fifty years ago that an American astronaut first orbited the Earth. John Glenn made history on February twentieth, nineteen sixty-two. He became a hero to millions of Americans.

Just seven years after that flight, NASA reached all the way to the moon. The world watched and listened as astronaut Neil Armstrong became the first man on the moon.

That was nineteen sixty-nine. Now, a huge national debt has forced the federal government -- and the American people -- to set lower expectations. This month, the Obama administration proposed cuts in many federal programs. NASA did not escape the budget cuts.

BOB DOUGHTY: Astronaut Cady Coleman has been to space three times. Last year, she spent nearly six months on the International Space Station. Even with the threat of cuts, she believes the American space agency can do great work.

CADY COLEMAN: "The fact that we have a space station in orbit right now, six people living up there -- working, doing experiments that we can't do down here. It makes me very excited about the future."

President Obama says that future includes plans to send people to the planet Mars, but not anytime soon. Charles Bolden is the head of the space agency. He recently spoke about efforts to reach Mars, including a program called MAVEN, the Mars Atmosphere and Volatile Evolution Mission.

CHARLES BOLDEN: "The missions currently at Mars, the Mars Science Laboratory on its way, and MAVEN - well into development - will provide many years of data to help us understand the red planet and our needs in future years to meet the president's challenge to send humans to Mars in the mid-twenty-thirties."

BOB DOUGHTY: American scientists have already used a number of devices -- landers, orbiters and rovers -- to gather details about Mars. The Mars Science Laboratory - known as Curiosity - is set to land on the red planet in August. And NASA hopes to launch the MAVEN spacecraft as early as next year.

The United States has no plans to end its exploration of Mars. But it is surely slowing down the speed of that exploration. NASA says the cuts would mean it will not have the money to move forward with what are called "ExoMars" missions. These projects were to be joint efforts between NASA and the European Space Agency.

BARBARA KLEIN: The proposed NASA budget calls for a twenty percent reduction in spending for planetary science. That would mean three hundred million dollars in cuts from the program's twenty-twelve budget of 1.5 billion dollars.

But the news for the space agency is not all bad. There are proposed spending increases for some programs. For example, the president's budget would increase spending for development of a new commercial manned spacecraft. It would double to eight hundred thirty million dollars the amount for developing private spacecraft to replace the space shuttle program, which ended last year.

(MUSIC)

BOB DOUGHTY: American communities often use zoning laws to control where businesses may operate in a neighborhood. Now there is a move to zone parts of the ocean.

Several states and the federal government have plans to organize competing uses for their coastal waters. Interest in such planning grew in two northeastern states following reports of wind-turbine energy projects being built close to seaside towns. On the West Coast, the interest came as a result of wave and tidal energy development.

However, balancing competing uses for coastal waters has proved difficult. At first look, the Pacific Ocean appears mostly empty. But it is anything but that. Recently, the state of Oregon published a digital map of the Oregon coast on the World Wide Web. The map includes about fifty levels of information about existing ocean uses and the environment.

BARBARA KLEIN: The United States Congress created the Sea Grant program to bring attention and resources to ocean and coastal issues. Todd Hallenbeck is a Sea Grant fellow in Oregon. He uses his laptop computer to show major fishing grounds.

Todd Hallenbeck

TODD HALLENBECK: "There's a large area of the territorial sea that's important to fishing with the darker red colors representing some of the most important areas for each of the ports.

Purple lines stretch across the screen of his laptop computer. Little marks representing seabird colonies appear along the coastline.

BOB DOUGHTY: Justin Klure works for Pacific Energy Ventures, a business development company. He feels uneasy with the first set of lines on the ocean planning map.

JUSTIN KLURE: "First blush that those maps look a little intimidating from the industry perspective, only because the areas that they've identified are relatively small and don't align, I think, with some of the basic requirements that the industry is looking at, which is, you know, access to port, access to transmission, certain water depths."

Todd Hallenbeck admits there are problems.

TODD HALLENBECK: "There are not a ton of areas that seem to not have something of importance in them already. And so the challenge here is finding the few areas that do exist that have the least amount of conflict."

But Justin Klure is not giving up hope yet. He argues for what he calls a mixed use approach while more information is gathered.

BARBARA KLEIN: The planning process is moving slowly. It has frightened off at least one ocean energy company interested in Oregon. Scotland-based Aquamarine Power closed its Oregon office last autumn. In a statement, the company expressed its hope of returning to the Pacific Northwest someday.

Aquamarine Power's energy generator uses a large mechanical flap placed just below the surface of the water. A more traditional ocean energy design uses a series of buoys floating on the water. There are also plans to use pressure-sensitive airbags on the sea floor.

The ocean mapping and zoning process will not stop development of the West Coast's first commercial wave-energy park. Ocean Power Technologies' demonstration project near Reedsport, Oregon, has already been approved. The company plans to launch the first of ten large floating wave energy generators there later this year.

(MUSIC)

BOB DOUGHTY: Massage not only feels good -- it also does good things. The healing effects of massage are well-known. But less is known about why putting pressure on body parts can ease painful muscles. Researchers are now beginning to uncover the reasons why.

Massage is commonly used in sports to help the overworked muscles of athletes. It also can be part of physical therapy programs to help patients recover from injuries.

AP
A new study suggests that massage may work in a way similar to pain medicines like aspirin

BARBARA KLEIN: A new study suggests that massage may work on the cellular level in a way similar to pain medicines like aspirin. Mark Tarnopolsky is a professor of pediatric medicine at

McMaster University in Canada. He led a study that attempted to find a biological explanation for the healing properties of massage.

Professor Tarnopolsky and his team studied eleven young men. They exercised on stationary bicycles. All the exercise made the young men very tired, although the bikes never left the room.

BOB DOUGHTY: The men had muscle biopsies in each leg before biking. A small piece of muscle tissue was removed for future testing. Each subject then had one leg massaged after exercise. Another piece of muscle tissue was taken from each leg ten minutes after the end of the massage. More muscle tissue was removed again two and a half hours later during the recovery period.

Professor Tarnopolsky says his team did a genetic study of each of the tissue samples.

MARK TARNOPOLSKY: "What we did is we looked at whatever genes were influenced by exercise in a different way in the massaged versus the non-massaged leg. And what came out of that were two different pathways."

BARBARA KLEIN: In the tissue of the massaged leg, researchers found a decrease in inflammatory cytokines, or proteins. They also found an increase in mitochondria, compared to tissue from the unmassaged leg. Mitochondria are the energy-producing parts of cells.

Inflammation, or enlargement, is evidence of tissue damage. Mitochondrial production is a sign of tissue recovery.

The researchers say their findings suggest that massage acts on the cellular level in the same way as many medicines for fighting pain. But these drugs are known to have serious side effects. The researchers believe that massage may be an effective and safer method that could be used as part of normal medical treatment.

A report on the study was published in the journal Science Translational Medicine.

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BOB DOUGHTY: This SCIENCE IN THE NEWS was written Brianna Blake and Christopher Cruise. Our producer was June Simms. I'm Bob Doughty.

BARBARA KLEIN: And I'm Barbara Klein. We have a video about the anniversary of John Glenn's Earth orbit and planned Mars missions on our website,

voaspecialenglish.com. Join us again next week for more news about science in Special English on the Voice of America.