



# NPS IN THE NEWS

## Weekly Media Report -Oct. 13-19, 2020

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### SGL:

1. [Leaders Discuss Artificial Intelligence for National Security in Naval Postgraduate School Guest Lecture](#)

(Navy.mil 15 Oct 20)

(NPS.edu 15 Oct 20) ... Mass Communication Specialist 2<sup>nd</sup> Class Tom Tonthat

The Joint Artificial Intelligence Center (JAIC) is the Department of Defense's lead organization for accelerating the adoption of artificial intelligence (AI) across the services. And it's a critical role, as top leaders believe AI will eventually impact every warfighting domain, even every mission, the DOD undertakes.

With NPS faculty and students currently teaching and researching varied AI concepts and applications, and translating them into future naval capabilities, the university is deeply embedded in advancing the technology and the DOD's AI workforce. With this role in mind, NPS hosted two of the JAIC's most senior leaders, retired Air Force Lt. Gen. John N.T. "Jack" Shanahan, the inaugural and former Director, and Nand Mulchandani, the current Chief Technology Officer, to speak to students, faculty and staff about their experiences organizing efforts to develop artificial intelligence (AI) projects on a DOD scale during NPS' latest virtual Secretary of the Navy Guest Lecture (SGL), held Oct. 13.

### EDUCATION:

2. [New Critical and Strategic Thinking Course Responds to DoD's Latest Guidance](#)

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The Naval Postgraduate School (NPS) launched a new course for the summer quarter titled "Critical Thinking for Strategic Leadership," responding directly to DOD education guidance to focus on critical thinking and using interdisciplinary and integrative approaches to solve warfighting problems.

3. [NWC-at-NPS Awards Academic Honors for Summer AY'2020 Quarter Class](#)

(NPS.edu 16 Oct 20) ... NWC Monterey Program

The Naval War College (NWC) Monterey program for Joint Professional Military Education (JPME) recognized 19 graduates from its latest class for earning academic honors for the 2020 Summer Quarter.

### RESEARCH:

4. [Climate Models: The Limits in the Sky](#)

(Engineering & Technology 13 Oct 20) ... Paul Dempsey

The discipline of climate modelling has entered its sixth decade. Large-scale analyses of Earth's behaviour have evolved considerably but there remain significant gaps, some persistent. One in particular helps illustrate challenges that are now being tackled by, almost inevitably, using artificial intelligence (AI) and machine learning (ML)... The alliance is targeting a 2023 1.0 release – albeit this was a pre-Covid deadline – with v0.1 as a "first step" in terms of validating the strategy, the use of Julia and – as with the Cloud Brain – building acceptance within the climate

research community. The team already comprises members from Nasa's Jet Propulsion Laboratory, the Massachusetts Institute of Technology, and the **US Naval Postgraduate School** as well as Caltech.

## 5. [NAVMAR Transitions First Wave of IWRP Prototypes to Production](#)

(DVIDS 19 Oct 20) ... Carmen Judge

The Naval Information Warfare Systems Command (NAVMAR) recently hit a significant milestone and transitioned the first wave of Information Warfare Research Project (IWRP) prototypes to production through an Other Transaction Authority Production (OTP) award using 10 U.S.C §2371b(f) Authority... The databases of the **Naval Postgraduate School**, Naval War College, Defense Technical Information Center and the Center for Naval Analysis were used in the APAC pilot.

## FACULTY:

### 6. [Israel and Lebanon Hold Talks to Set Maritime Border](#) [AUDIO]

(OMNY.fm 14 Oct 20)

Lebanon and Israel, still technically at war, have held unprecedented talks under UN and US auspices to settle a maritime border dispute and clear the way for oil and gas exploration within "reasonable time."

KAN's Mark Weiss spoke about the talks with **Brenda Shaffer, US Navy Postgraduate University**, an expert on East Mediterranean maritime disputes.

### 7. [Watch: China Tests 'Swarm Drone Technology' That Can Outflanks Enemy Defences](#)

(Eurasian Times 15 Oct 20)

China has successfully tested its drone "swarm" system which makes the threat of swarm technology even more real, especially in an era where China is facing adversaries like the US, India, Japan.

Defence analysts believe that it is very difficult for the adversary to combat with these swarming drones. According to **Isaac Kaminer, an engineering professor at the U.S. Naval Postgraduate School** – large-scale adversarial swarms are already an imminent threat. He suggested that stopping a swarm is not simply a matter of driving enough missiles or bullets at it; instead, the swarm has to be outsmarted.

### 8. [Political Aspirations Outweigh Religious Beliefs in Iran's Unnatural Feud with Azerbaijan](#)

(Iran Wire 15 Oct 20) ... Emil Filtenborg & Stefan Weichert

Shia Muslims make up the majority of the population in both Iran and Azerbaijan. And yet the two countries have a problematic relationship, which has only become worse with increased hostilities between Armenia and Azerbaijan. Speaking to IranWire, one Armenian politician says Iran should be more actively involved in the current conflict in order to protect its interests, while a regional expert warns that the war threatens to destabilize Iran's domestic environment ... From the perspective of **Brenda Shaffer, a professor at the US Naval Postgraduate School**, the feud is not so much about the Azerbaijani relationship with Israel. "Some write that Tehran is not supportive of Azerbaijan due to Baku's close ties with Israel, but this is chronologically not correct," Shaffer said in an email to IranWire.

## ALUMNI:

### 9. [State Sen. Questions Top DHS Administrator's Qualifications](#)

(APG Wisconsin 15 Oct 20) ... Benjamin Yount

One Wisconsin state senator wants to know what a woman who went to college to be an art teacher knows about infectious diseases.

Republican Sen. Steve Nass, R-Whitewater demanded answers from Department of Health Services Secretary-designee Andrea Palm about Stephanie Smiley, a Naval Postgraduate School alumna, who heads the state's Bureau of Communicable Diseases.

### 10. [Salas Named for Belen City Manager](#)

(El Defensor Chieftain 15 Oct 20) ... Clara Garcia

A candidate running for the District 2 seat on the Socorro County Commission was appointed as the new city manager in Belen.



Belen Mayor Jerah Cordova appointed Retired Gen. Andrew Salas, a Naval Postgraduate School alumnus, of Bernardo, located in northern Socorro County, to the position last week, and the council unanimously voted to approve the appointment.

## **UPCOMING NEWS & EVENTS:**

**November 3:** Election Day

**November 11:** Veteran's Day

**November 26:** Thanksgiving

## SGL:

### Leaders Discuss Artificial Intelligence for National Security in Naval Postgraduate School Guest Lecture

(Navy.mil 15 Oct 20)

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The Joint Artificial Intelligence Center (JAIC) is the Department of Defense's lead organization for accelerating the adoption of artificial intelligence (AI) across the services. And it's a critical role, as top leaders believe AI will eventually impact every warfighting domain, even every mission, the DOD undertakes.

With NPS faculty and students currently teaching and researching varied AI concepts and applications, and translating them into future naval capabilities, the university is deeply embedded in advancing the technology and the DOD's AI workforce. With this role in mind, NPS hosted two of the JAIC's most senior leaders, retired Air Force Lt. Gen. John N.T. "Jack" Shanahan, the inaugural and former Director, and Nand Mulchandani, the current Chief Technology Officer, to speak to students, faculty and staff about their experiences organizing efforts to develop artificial intelligence (AI) projects on a DOD scale during NPS' latest virtual Secretary of the Navy Guest Lecture (SGL), held Oct. 13.

Shanahan and Mulchandani are the latest high-profile leaders to participate in the virtual SGL series, following the likes of retired Adm. Mike Mullen, Army Gen. [Keith B. Alexander](#) and retired Navy Vice Adm. [Jan E. Tighe](#), and retired Adm. William McRaven.

Retiring earlier this year after serving as JAIC's first director, Shanahan opened the talk by briefly reviewing how the JAIC evolved from an Algorithmic Warfare Team synthesizing DOD's sheer volume of collected full-motion video data, called Project Maven, into a joint platform to harness the "game-changing power of AI."

"Project Maven was focused on the intelligence enterprise to automate, accelerate and augment the processing, exploiting and dissemination of intelligence," said Shanahan. "Humans were doing mind numbing duty looking at video screens 12 hours a day. We really needed something that would allow us to begin to really accelerate the adapting, fielding and scaling of existing AI into capabilities, and that is how [JAIC] got started into the fielding and scaling of AI for the whole DoD."

"From undersea to outer space and cyberspace, from the back office to the battlefield, there is no mission in the DOD that will not be enhanced in some way by AI," continued Shanahan. "What I believe the JAIC will be known for in five years is building a joint common foundation focused on product development, and a distinct focus on end-user experience and interface where warfighters can come in and get access to the data and operational tools they need."

As JAIC grew and expanded from a small team to a staff of more than 200 people, Shanahan reflected on the single most important hire he made in standing up the organization, bringing in Mulchandani as the Chief Technology Officer. Mulchandani, who has 25 years of experience in the technology industry as a serial entrepreneur and senior executive, brought key understanding of turning project management into product development which changed the entire organization from the beginning, according to Shanahan.

"The work that he and I did in terms of teaming up where [Shanahan] being the classic CEO founder type, combined with the best of product development, I think that was the most powerful combination in founding AI for the DOD," said Mulchandani. "One thing that startups do incredibly well is finding canonical patterns and building a highly-leveraged conclusion that they can attack in a very low cost but highly leveraged way. That's the whole point of having a common infrastructure where you can find a pattern and then create a repeatable pattern and scale it to a point where everybody with an engine across the DOD can utilize this pattern."

The presentation was broadly acclaimed. Distinguished Professor Peter Denning, Director of the university's new Consortium for Intelligent Systems Education and Research (CISER) called the presentation one of the best yet.

"This was the first time I've heard such a coherent and visionary view of what the DOD can accomplish and how the JAIC can facilitate," said Denning. "Everything they said made sense. I loved the



principles about integrating the four areas of concern, about centralized direction and decentralized implementation, about putting ethics in the forefront of conversations, and about having great relations with our allies. It stimulated the liveliest discussion I've seen so far in an VSGL."

In routine SGL fashion, Shanahan and Mulchandani also fielded questions at the conclusion of their primary remarks. Student questions ranged from topics such as developing AI talent management to the prevention of overreliance on future AI.

"What is instrumental in getting [AI] right is test and evaluation," said Shanahan. "The issues of accountability and ethics are at the forefront and that is why we are different as the DOD. We do have to think about 10 years from now where somebody somewhere wearing a uniform our suit could be held accountable for [AI] decisions. But we have a lot of people who know how to do this right who understand the boundary conditions so [AI] adheres to the specific purposes for which it is built."

Mulchandani views the AI elements of accountability, ethics and testing and evaluation as all being inter-related and should be thought of as one single core point.

"If I can't explain it, if I can't understand it and if I can't test it right, then I can't secure it. If I can't secure it, I can't deploy it in a way that creates the desired effect," he said.

When Marine Corps Master Sgt. Travis Hollingshead, an NPS student pursuing a Master of Applied Cyber Operations degree posed a question about the role of active duty military members within the JAIC's current environment, recently-confirmed JAIC Director Marine Corps Lt. Gen. Michael Groen, made a surprise appearance on Mulchandani's virtual feed and answered that question.

"What we need are warfighters," said Groen. "We need people who understand how decisions are made and how our decisions are structured. We can have all the genius data scientists in the world, but we need somebody who can sit down with a fires [lethal effects] expert, somebody who understands the rules, the outline, the process, and what data informs the decision. If you don't have that level of decision expertise, artificial intelligence applied to the decision is useless."

"We want to build the education pipeline for different work roles in the AI business," Groen continued. "People touch AI in different ways, there are builders, users and employers, and each one of those skill sets are necessary for us to have a comprehensive understanding of not only bringing AI to the table, but what table to bring it to and what it is supposed to do when it gets there. That's where having uniformed experts who are really good at the craft can extend their knowledge to AI realm to do data science."

Shanahan encouraged the NPS audience to continue their innovative drives and research into AI, and to be the leadership who can embrace it.

"We need more leaders who want to understand what AI is and what it is not," said Shanahan. "*If* you do something well enough and fast enough and long enough over time, the culture begins to change, but it requires generation upon generation of leaders that are really focused on how to get it right. You're out there. You represent those innovators by being out at NPS right now, and what you're looking for is someone to give you an opportunity to succeed."

To watch the complete lecture and student Q&A session with retired Air Force Lt. Gen. John N.T. "Jack" Shanahan and Mr. Nand Mulchandani, visit the [SGL website](#) or [NPS YouTube](#) channel.

<https://www.navy.mil/Press-Office/News-Stories/Article/2383612/leaders-discuss-artificial-intelligence-for-national-security-in-naval-postgrad/>

<https://nps.edu/-/artificial-intelligence-leaders-discuss-ai-for-national-security-in-nps-latest-guest-lecture-1>

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## EDUCATION:

**New Critical and Strategic Thinking Course Responds to DoD's Latest Guidance**  
(*NPS.edu 14 Oct 20*) ... Mass Communication Specialist 2<sup>nd</sup> Class Taylor Vencill



The Naval Postgraduate School (NPS) launched a new course for the summer quarter titled “Critical Thinking for Strategic Leadership,” responding directly to DOD education guidance to focus on critical thinking and using interdisciplinary and integrative approaches to solve warfighting problems.

National defense and military strategies alike are increasingly emphasizing the link between higher education and warfighting advantage, keying on advancements in critical thinking as a vital enabler and key skill for strategic leadership.

The National Defense Strategy, the Commandant’s Planning Guidance, the Department of the Navy’s Education for Seapower Strategy, and even a recent Chief of Naval Operations fragmentary order all call for the intellectual development of warfighters to improve critical thinking and interdisciplinary learning skills, as the nature of conflict changes, moving beyond the industrial age and into the cognitive and information age. Additionally, the National Defense Strategy directed military institutions to focus on critical thinking to encourage innovation.

Responding to this strategic guidance, Professor Mie Augier of the Graduate School of Defense Management, and a founding member of Naval Warfare Studies Institute, developed the new course, focused on how to cultivate some of the central skills, attitudes and aptitudes to think critically, and using those to strategically lead warfighting organizations.

“The course examines key warfighting leaders and thinkers to understand and link their decision making to the underlying concepts and practices in critical and strategic thinking,” said Augier. “Moreover, we learn and discuss perspectives and ideas for how to be better strategic and critical thinkers, including how to cultivate lifelong learning, and being able to reframe problems to make sure we have better insight and understanding of them from different points of view.”

The course uses active learning approaches, included case studies and exercises. It also had interactive discussions with guests to help facilitate the intellectual growth of warfighter students. One such guest, retired Marine Corps Maj. Gen. William F. Mullen, then Commanding General of Marine Corps Training and Education Command, spoke on the topics of interdisciplinary thinking, learning and leadership for warfighting professionals.

Mullen emphasized themes such as the importance of dedicating oneself to learning as an essential element of professionalism, and of viewing the brain as a muscle that, like other muscles, needs exercise to avoid atrophy.

“He noted the importance of deliberately reading broadly to cultivate intellectual range, insight and the ability to think critically,” said Augier.

Mullen’s discussion with the class gave a lasting impressing on the students and altered the way some thought about education, and how they should continue to strengthen their minds.

“Mullen’s discussion has forever changed and influenced my prior thinking regarding reading,” said NPS student U.S. Navy Lt. Elena Williams. “One thing he said that stuck out was, ‘We view reading as work and not a leisure activity.’ Prior to his discussion, I thought of reading as work so I need to alter my perception and predetermined feelings towards reading to consider it an opportunity rather than a chore.”

A later discussion featured retired Marine Corps Gen. Al Gray and Col G. Wilson discussing topics that had been examined in the course in the context of Gray’s own strategic leadership of the Marine Corps when he was commandant.

Augier noted, “It was a great honor to have Gen. Gray interact with us in class. His ideas and leadership not only embody the central aspects of critical thinking and the use of critical thinking in strategic leadership of organizations – he also has been a key inspiration and mentor in the development of this course and thinking about the topic.”

Many of the themes discussed with Gray tied back to his strategic leadership and transformation of the USMC around maneuver ideas. For example, as Commanding General in the 2nd Marine Division, he developed a package of literature on maneuver warfare, set up a professional study group as well as a maneuver warfare board.

After hours discussions were focused on the merit of ideas, not rank, and during after action reviews, he was focused on what the Marines did and what they were thinking about it, more than ‘what’ they did – cultivating thinking and an awareness of the thinking and learning process. When Gray became



Commandant, he institutionalized the intellectual renaissance underlying maneuver warfare; publishing a reading list for all Marines; revising the Marine Corps Institute's professional education curriculum, revitalizing the Command and Staff College curriculum and faculty, and founding Marine Corps University (MCU). His vision for the Marine Corps PME system was to teach critical thinking and judgment, not material to be memorized; and using active learning approaches.

The discussion with Gray and Wilson was a fitting conclusion for the course. Students had studied critical thinking, interdisciplinary learning, and how to use critical thinking in strategic leadership, and immediately got to the key points of the Maneuver Warfare Movement and quickly related it to the earlier discussions about the importance of lifelong learning. The lively interaction also included the importance of education at all levels –beyond school – and broad reading, which was also a theme emphasized by Mullen.

NPS continues to push the boundaries on education and innovation, Augier says, and the Critical Thinking for Strategic Leadership course is another example of how NPS is responsive to Navy and Marine Corps needs in a rapidly-changing world environment.

Feedback from the inaugural, interdisciplinary cohort of students representing three of the university's four graduate schools was very positive. As Marine Corps Maj. Philip Schmitz noted, "The learning and discussions facilitated in this class are some of the deepest discussions I have been a part of in 18.5 years in the military, and it shouldn't have taken this long for that to occur. I walk away from class with more energy than I started with—that to me is profound!"

<https://nps.edu/-/nps-responds-to-strategic-guidance-with-critical-and-strategic-thinking-course>

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## **NWC-at-NPS Awards Academic Honors for Summer AY'2020 Quarter Class**

(*NPS.edu* 16 Oct 20) ... NWC Monterey Program

The Naval War College (NWC) Monterey program for Joint Professional Military Education (JPME) recognized 19 graduates from its latest class for earning academic honors for the 2020 Summer Quarter.

Graduates earning "with Highest Distinction" honors by completing the JPME program in the top five percent of their class are Army Maj. Diego A. Rincon and Christopher T. Yanko, Navy Lt. Cmdr. Robert J. Thompson, Navy Lt. Ian M. Kelly and Marine Corps Capt. Alex J. Pfannenstiel.

Graduates earning "with Distinction" honors by completing the JPME program in the top 15 percent of their class are Army Maj. Michael R. Griffin, Christopher B. Smith, and Gene F. Uhler; Army Cpts. Nicholas J. Grazer, Joshua K. McMillion, and Chummie S. Recel; Navy Lt. Cmdr. Christopher G. Saxton; Navy Lts. Patrick M. Carter, Matthew L. Jackson, John W. Kim, David A. Kramer, and Olivia L. Wittman; Marine Corps Maj. Larry W. Wigington; and, Marine Corps Capt. Brandon E. Hee.

Through the NPS-NWC partnership, a total of 5,812 officers have earned their Joint Professional Military Education Phase I certification since the program's inception in September 1999.

<https://nps.edu/-/nwc-at-nps-awards-academic-honors-for-summer-ay-2020-quarter-class>

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## **RESEARCH:**

### **Climate Models: The Limits in the Sky**

(*Engineering & Technology* 13 Oct 20) ... Paul Dempsey

The discipline of climate modelling has entered its sixth decade. Large-scale analyses of Earth's behaviour have evolved considerably but there remain significant gaps, some persistent. One in particular helps illustrate challenges that are now being tackled by, almost inevitably, using artificial intelligence (AI) and machine learning (ML).



“How important the overall cloud effects are is, however, an extremely difficult question to answer. The cloud distribution is a product of the entire climate system, in which many other feedbacks are involved. Trustworthy answers can be obtained only through comprehensive numerical modelling of the general circulations of the atmosphere and oceans together with validation by comparison of the observed with the model-produced cloud types and amounts. Unfortunately, cloud observations in sufficient detail for accurate validation of models are not available at present.”

This passage comes from one of the cornerstone reports on climate change, the 1979 Woods Hall review by the US government’s Ad Hoc Study Group on Carbon Dioxide and Climate. It was chaired by pioneering meteorologist Professor Jule Charney of MIT, the man who brought computers into weather forecasting with John von Neumann. Most of what Charney’s group said about clouds then stands today.

Clouds matter because more than 40 years later there is still scientific debate over the extent to which they sometimes warm and sometimes cool the planet, and what impact the balance has on global temperature. Put simply, clouds that are higher in the atmosphere and thinner trap heat; those that are lower and thicker reflect the sun rays.

Research published in September from a joint team at the University of Liverpool, Imperial College London and the UK’s National Oceanography Centre highlighted that this lack of clarity is one leading reason why macro-scale models differ over what goals should be set for carbon emissions.

Moreover, the issue is today more pressing because as the Earth’s climate is already changing, so too are the proportions (high:low, thick:thin) and locations of the clouds and, by extension, their influence.

Clouds have proved hard to model because they defy the nature of the recognised macro-modelling strategies (as indeed do several other factors these models struggle to embrace, such as eddies in ocean currents).

The workhorse – used by the main contributors to the Assessment Reports released by The Intergovernmental Panel on Climate Change – is the general circulation model (GCM), a technique that pulls on fluid dynamics equations and thermodynamics, supplemented by parameterisation.

GCMs and their extensions are extremely complex, running to millions of lines of code. As an example of the 20 or so GCMs considered world-class, the HadCM3 coupled atmospheric and oceanic model (AO-GCM), developed by the Hadley Centre at the UK’s Met Office, can run simulations out across more than a thousand years.

In some other respects GCMs run at very low resolutions. They are based on imposing a 3D grid upon the sphere of the Earth. In earlier implementations, the grid’s boxes were several hundred kilometres square and had half a dozen or so vertical layers. Some of the limitations were inherent in the complexity ceilings for the models as they evolved, but another major constraint has always been computational capacity. Climate modelling has tested and reached the limits of just about every generation of supercomputer, with every doubling in spatial resolution said to need a tenfold increase in processing.

As we move into the era of exascale supercomputers and quantum processing potentially moves out of the lab, resolutions are rising – as the Met Office notes, it is leveraging 256 times more crunching power today – but resolution maximums remain in a range between the lower hundreds-of-kilometres and upper tens.

Clouds, by contrast, are highly localised and comparatively brief events, requiring finer resolution to be addressed in the detail thought necessary. They still fall through the gaps. There is then a further complication.

We think of climate models in terms of the forecasts they produce. Alongside the high-profile targets such as keeping the rise in temperature below 2°C, every week seems to bring a new, more event-specific observation about sea levels, potential species extinction or migrations in population. And the need for this kind of more granular modelling is widely acknowledged.

Within the modelling community itself, another important task – particularly as models are refined and extended – involves looking into the past: does the model account for how the world’s climate has already behaved if you run it backwards? Of little interest to the public, this so-called hindcasting is very important for validation.



Again – and very likely because of the brevity and local nature of clouds – there is very little historical data available against which to compare cloud modelling.

The combination of a lack of resolution, knowledge and insight would appear to be fertile territory for machine learning, and a number of research projects are looking to leverage such techniques.

The Cloud Brain is the nickname given to research backed and conducted partly by Vulcan, the venture set up by the late Microsoft founder Paul Allen, with research teams at Columbia University and the University of California, Irvine.

Its latest research addresses a concern that parameters derived through neural-network-based ML and then inserted into GCMs in pathfinder projects have led to “dramatic instability”.

Its paper describes tools it has developed to predict and analyse such instability and proposes ways of improving the coupled performance. It argues: “Reassuringly, ML parameterisations appear to behave according to our physical intuition, creating the potential to accelerate current parameterisations and develop more accurate data-driven parameterisations.”

The Cloud Brain strategy acknowledges that there are trust hurdles to the widespread adoption and integration of ML-based modelling elements. A wider scientific community needs to be convinced, and climate-change sceptics can pretty much be counted on to seize upon such innovations in predictable fashion.

Another initiative, the Climate Modelling Alliance (CliMa), is looking to develop not merely enhancements to existing models but a completely new one by combining a range of emerging technologies.

“Our climate model will use many more data than any other climate model. Earth observations: from space, from floats in the ocean, from the ground,” explains CliMa principal investigator and Caltech professor Tapio Schneider. “And data also generated computationally with high-resolution simulations, for example of clouds. What we are doing is to embed high-resolution simulations of these small patches of the globe and have the model learn from those processes, from those simulations.”

To further illustrate CliMa’s more radical approach, the team is building its model in the comparatively new Julia programming language for high-performance computing to fast-track development.

In June, CliMa said that it had reached its first milestone, a v0.1 comprising “code for large eddy simulations of turbulent flows in atmosphere and oceans and for dynamical cores of GCMs for the ocean and atmosphere”. It targets the GPU architectures that are being ported from graphics to ML because of their parallelism and increasing AI infrastructure support.

The alliance is targeting a 2023 1.0 release – albeit this was a pre-Covid deadline – with v0.1 as a “first step” in terms of validating the strategy, the use of Julia and – as with the Cloud Brain – building acceptance within the climate research community. The team already comprises members from Nasa’s Jet Propulsion Laboratory, the Massachusetts Institute of Technology, and the **US Naval Postgraduate School** as well as Caltech.

Before any of this work moves into the mainstream, however, the IPCC is scheduled to release its sixth major report (AR6) in stages over the course of 2021 and 2022 (although it has warned that some dates may be subject to change), starting with a review of the physical science next spring, followed by findings on mitigation and impact.

Some advanced techniques are already finding their way into the various already established models feeding into AR6, though the extent to which AI and ML are needed (or are capable) for filling in cracks like clouds and ocean currents will necessarily take a little longer to demonstrate.

Given that they seem to offer solutions to not only long-standing but also increasingly pertinent challenges, hopefully not too much longer.

<https://eandt.theiet.org/content/articles/2020/10/climate-models-the-limits-in-the-sky/>

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## **NAVMAR Transitions First Wave of IWRP Prototypes to Production**

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The Naval Information Warfare Systems Command (NAVMAR) recently hit a significant milestone and transitioned the first wave of Information Warfare Research Project (IWRP) prototypes to production through an Other Transaction Authority Production (OTP) award using 10 U.S.C §2371b(f) Authority.

At the close of fiscal year 2020, NAVMAR awarded three OTPs marking the beginning stages of an accelerated pathway designed to take successful IWRP prototypes into production and rapidly deliver key technology for warfighter application. The IWRP uses an alternative acquisition method, called an other transaction authority (OTA), to streamline acquisition processes, develop prototypes, and rapidly provide advanced technologies to the fleet. The three OTPs had a combined ceiling value of approximately \$104 million.

“These transitions into production are a huge win for the Navy and illustrate our ability to use this unique acquisition authority to rapidly deliver solutions on behalf of our Sailors and Marines,” said NAVMAR Commander Rear Adm. Doug Small. “I’m extremely proud of our IWRP team, who showed that bringing the right tool to the acquisition job can quickly bring results.”

Follow on production agreements are allowed as sole source awards under 10 U.S. Code section 2371b(f). These original agreements must be competed in advance, stated as potentially having a follow on production opportunity at the time of solicitations, and the prototype must be determined to be successful in order for it to transition into production. Production agreements can be either an OTP or a Federal Acquisition Regulation-based contract.

“This process provides a unique opportunity to leverage an OTA to not only rapidly prototype – which we are actively and successfully doing through IWRP – but also to rapidly produce technology and place it in the hands of our Sailors and Marines faster,” said Don Sallee, Naval Information Warfare Center (NIWC) Atlantic acquisition planning services manager.

The three IWRP prototypes moving into production include the U.S. Marine Corps’ Low Altitude Range Communication System (LARCS), the Chief of Naval Operations Navy Programming Division’s (OPNAV N80) Analytic Performance Assessment Capability (APAC) and the Defense Health Agency’s (DHA) Healthcare Master Data Management (MDM) software tool.

“Our first OTPs demonstrate the breadth and reach NAVMAR is striving for through IWRP,” said Jee Youn Fickling, program manager for IWRP at NIWC Atlantic. “We are making connections across the Naval enterprise and collaborating with nontraditional partners to leverage the right knowledge base and expertise to innovate information warfare technologies and address the most immediate needs of the Navy and Marines Corps – and that’s exactly what these initial production agreements are doing.”

NIWC Atlantic’s LARCS team received the first prototype award through IWRP in 2019, and now represents a Marine Corps-tested technology that will be at the disposal of the warfighter in the future.

LARCS takes the Marine Corps’ analogue air-to-ground communications system and modernizes it to a voice over internet protocol user environment with graphical user interfaces to bridge gaps between different systems.

“It feels incredible to be pioneers of this process and to be able to see LARCS go from initial concept all the way to production award,” said Allen Hillman, NIWC Atlantic LARCS team lead. “The streamlined process of IWRP and the ability to communicate with all the key players while developing the requirements were key to creating an information warfare solution that directly aligns with the needs of the Marine Corps.”

The IWRP’s second production award, APAC, takes a larger Navy-wide data management challenge and offers a robust informational library that provides leaders immediate decision-making material. Through the application of innovative artificial intelligence, machine learning algorithms and data analytics, the capability connects millions of key exercise documents, historical papers, research and war gaming materials into a centralized location that can be accessed by leaders on demand.

The databases of the **Naval Postgraduate School**, Naval War College, Defense Technical Information Center and the Center for Naval Analysis were used in the APAC pilot.

In a similar vein, the third OTP addresses Master Data Management through the lens of medical repositories and data analytics servicing all branches of the military. NIWC Atlantic's Medical Information Delivery (MID) team and its defense health customer, DHA's Program Executive Office (PEO) Defense Healthcare Management Systems' (DHMS) Enterprise Intelligence and Data Solutions (EIDS) Program Management Office (PMO), oversaw the prototyping effort of the solution.

"The IWRP gave us a forum and an opportunity to present our problem to 'crowd source' ideas from a very broad swath of expertise and domains with which we may never have an opportunity to engage," said Sean Smith, NIWC Atlantic MID team lead. "That part of the process alone was innovative when compared with the traditional FAR-based industry interaction. That unhindered interaction ultimately helped us shape and define the solution we truly needed."

The prototype was built on a commercial off-the-shelf product to understand its growing DHA data repositories, easily identify redundant data, categorize the data for use, create and maintain effective data dictionaries, and provide the DHA with useful data catalogs to guide consumption.

"This software tool ultimately benefits everyone," said Brian Palmatier, NIWC Atlantic MDM project lead. "Not only will it replace the current implementation, which NIWC Atlantic is supporting for the EIDS PMO, but it also allows us to help the EIDS PMO orchestrate a data governance model that uses data management best practices."

Once produced and fully implemented, the solution will save time and money, explained Palmatier, and allow data scientists to access and locate medical data quickly and efficiently, ensuring both the security and quality of the data.

"The collaborative experience with IWRP, initially, was a small stretch from our team's comfort zone. However, once we gained a better understanding of Other Transactions and how the agreements worked, we really came to appreciate the open interaction with industry," said Smith. "This initial run from prototype to production was a great learning opportunity and we see the IWRP as another valuable tool in our box to help us drive faster delivery of necessary solutions to the DoD."

In addition to the three referenced prototypes, at least four other successful IWRP prototypes, rigorously tested by the projected end-user, are slated to receive OTP awards in the next three to four months. This year, IWRP awarded over \$100 million in prototype awards. As more IWRP prototypes complete their milestone demonstrations successfully, the number of follow on production agreements is expected to grow.

"Success for our team is the ability to put relevant and timely technology into the hands of the warfighter," said Kevin Charlow, IWRP Executive Steering Group chair and NIWC Atlantic deputy executive director. "Over the last two years, we've placed a great deal of emphasis on executing successful prototyping opportunities with the end goal of producing and inserting these innovations into the fleet. We're extremely proud to have moved the needle forward on this initiative, and we're excited for the growth and opportunities still to come."

As a part of Naval Information Warfare Systems Command, NIWC Atlantic provides systems engineering and acquisition to deliver information warfare capabilities to the naval, joint and national warfighter through the acquisition, development, integration, production, test, deployment, and sustainment of interoperable command, control, communications, computer, intelligence, surveillance, and reconnaissance, cyber and information technology capabilities.

<https://www.dvidshub.net/news/381241/navwar-transitions-first-wave-iwrp-prototypes-production>

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## FACULTY:

### Israel and Lebanon Hold Talks to Set Maritime Border [AUDIO]

(OMNY.fm 14 Oct 20)

Lebanon and Israel, still technically at war, have held unprecedented talks under UN and US auspices to settle a maritime border dispute and clear the way for oil and gas exploration within “reasonable time.”

In a joint statement, the United States and the United Nations said the talks had been “productive” and that the delegates had “reaffirmed their commitment to continue negotiations later this month.”

KAN's Mark Weiss spoke about the talks with **Brenda Shaffer**, formerly a professor at Haifa University and now at the **US Navy Postgraduate University**, an expert on East Mediterranean maritime disputes.

<https://omny.fm/shows/english-news-highlights/israel-and-lebanon-hold-talks-to-set-maritime-border>

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### Watch: China Tests ‘Swarm Drone Technology’ That Can Outflank Enemy Defences

(Eurasian Times 15 Oct 20)

China has successfully tested its drone “swarm” system which makes the threat of swarm technology even more real, especially in an era where China is facing adversaries like the US, India, Japan.

China Electronics Technology Group (CETC), a state-owned company reportedly conducted the test in September and released the video on Tuesday along with the details.

China has successfully tested its drone “swarm” system which makes the threat of swarm technology even more real, especially in an era where China is facing adversaries like the US, India, Japan.

China Electronics Technology Group (CETC), a state-owned company reportedly conducted the test in September and released the video on Tuesday along with the details.

According to Chinese local media reports, the test demonstrated the ability of the whole process such as the rapid deployment of vehicles, intensive launching, hovering and launching in the air, manoeuvring launching, precise formation, formation change, ground inspection and attack, and precision strike.

In the video, the drones are launched from a vehicle similar to the Dongfeng Humvee and a helicopter as well. According to David Hambling of the Forbes, China has long had tactical loitering munitions like the 20-pound CH-901, which cruises over the target area beaming back video for the operator to locate a target, then diving in to destroy it on command.

“The drones are launched with compressed air, then unfold their wings and fly to the target area with an electric-powered propeller. The kamikaze drones carry high-explosive warheads, potentially powerful enough to destroy tanks and other armour,” he stated.

The US is also in the race to develop swarming drone technology. The US Navy has already performed offensive swarm operations with its LOCUST drone swarm developed by Raytheon.

Last year, CETC unveiled a multifunction processing unit for swarm intelligence. According to the CETC, based on swarm intelligence algorithms and dynamic networking protocols, the processing unit features flight control, mission planning, intelligence decision-making and dynamic networking, integrating the flight control system and the measurement and control system of traditional drones.

While CETC didn’t reveal the name or designation of the drones or the complete system being used in the test, experts believe that the drones look similar to China Poly Defense’s CH-901.

It is also known as “suicide drones” and weighs 9 kilograms. It can be fitted with warheads or camera to perform reconnaissance missions and locate enemy positions. The CH-901 can fly at a speed from 7 to 120 km/h with a range of 10 km and, loaded with explosive warhead the drone can penetrate light armoured vehicles.

“In 2018 China displayed a launch vehicle with eight CH-901s, which would be launched one at a time. The difference here is the swarming technology, which means the operator only needs to designate



the target,” explained Hambling. The swarming system ensures that all the drones adhere to the same rules to follow cohesion without colliding with each other.

Defence analysts believe that it is very difficult for the adversary to combat with these swarming drones. According to **Isaac Kaminer, an engineering professor at the U.S. Naval Postgraduate School** – large-scale adversarial swarms are already an imminent threat. He suggested that stopping a swarm is not simply a matter of driving enough missiles or bullets at it; instead, the swarm has to be outsmarted.

Hambling also acknowledged the difficulty to counter such drones. He wrote that jammers may not be enough if the drones do not have a direct link to the operator and which may navigate by landmarks and do not rely on GPS. Missile and cannons could be too slow to shoot the swarm down. He concluded saying that US’ ‘counter swarm’ may be the only way to fight swarm drones.

<https://eurasiatimes.com/us-india-caught-off-guard-as-china-tests-swarm-drone-technology-that-can-outflank-enemy-defences/>

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## Political Aspirations Outweigh Religious Beliefs in Iran’s Unnatural Feud with Azerbaijan

(Iran Wire 15 Oct 20) ... Emil Filtenborg & Stefan Weichert

Shia Muslims make up the majority of the population in both Iran and Azerbaijan. And yet the two countries have a problematic relationship, which has only become worse with increased hostilities between Armenia and Azerbaijan. Speaking to IranWire, one Armenian politician says Iran should be more actively involved in the current conflict in order to protect its interests, while a regional expert warns that the war threatens to destabilize Iran's domestic environment.

A war has broken out in the Nagorno-Karabakh enclave between Armenia and Azerbaijan, claiming hundreds of lives near the Iranian border. The enclave is officially part of Azerbaijan, but it is run by ethnic Armenians supported by Armenia. Given Iran's increasing worries about the Azerbaijani government's ambitions in the region, the war threatens to cause further damage to an already fragile relationship between Iran and Azerbaijan. As a result, the Iranian government has been inclined to side with Armenia, despite it being a Christian country and Azerbaijan being mainly Shia Muslim.

Vahram Ter-Matevosyan, an associate professor at the American University in Armenia, explains that while it might seem strange that Shia Iran is siding with Christian Armenia, this is not a new development. In this conflict, political concerns outweigh religion.

"Iran does not want to have Turkey involved in the crisis," Ter-Matevosyan tells IranWire. "However, Turkey increasingly supports Azerbaijan, and the crisis becomes a geopolitical concern for Iran in their rivalry with Turkey, which is getting stronger and stronger. It is a rivalry dating back to when the Persian Empire and the Ottoman Empire were fighting and it is still here today."

Ter-Matevosyan also says that Iran is worried that Turkey has helped bring Syrian mercenaries, often radicals, to fight against Armenia, and has called for a ceasefire. Furthermore, he says, Iran is also angry at Azerbaijan for its ties with Israel: the country supplies weapons, including drones, to Azerbaijan.

"All of these concerns outweigh the religious question and, therefore, Iran mostly supports Armenia," says Ter-Matevosyan.

From the perspective of **Brenda Shaffer, a professor at the US Naval Postgraduate School**, the feud is not so much about the Azerbaijani relationship with Israel. "Some write that Tehran is not supportive of Azerbaijan due to Baku's close ties with Israel, but this is chronologically not correct," Shaffer said in an email to IranWire.

"Tehran articulated the policy clearly already in December 1991, as the USSR was collapsing. Iran perceived that when the USSR collapsed, two walls came down —not just between East and West Europe, but between the former Soviet Muslim republics and Iran. Iranian media and officials openly stated that they feared that nationalism could come over the border from the new republics of Azerbaijan and Turkmenistan and affect their own Azerbaijani and Turkmen populations. This policy was articulated five years before Azerbaijan and Israel established close cooperation."

## Politician: Iran Must Act

Armenia is squeezed in between Turkey, Azerbaijan, Iran, and Georgia. Its protector is supposed to be Russia, with which it has a defense pact. However, in the last few years, Russia has been selling modern weapons to Azerbaijan, which has called the alliance into question, and made it even more critical for Armenia to wow Iran.

"Armenia has been fighting terrorists and Turkish-controlled Azerbaijani forces. It is keeping a balance in the region," Sos Avetisyan, a member of the Armenian parliament for the party My Step Alliance, tells IranWire.

"Iran is a very important ally. They understand very well that the terrorists can move south, but they have been very balanced on this conflict," Avetisyan says. "They do not move, and usually, they will act only when they feel under threat. I don't think they are feeling that now. But they should be worried."

If Iran is not worried, it is certainly aware. Last week Iranian President Hassan Rouhani said, "We must be attentive that the war between Armenia and Azerbaijan does not become a regional war," according to a BBC report published on October 7.

According to Ter-Matevosyan, Iran has not done much to solve the crisis and he is not sure what the Armenian government is doing to secure Iranian help.

However, it might be difficult for Armenia to persuade Iranian officials that Iran and Armenia have similar concerns, he says.

"Iran is worried that if Azerbaijan gains the southern parts of Nagorno-Karabakh, the area will be very militarized, and Azerbaijan will surround a northern part of Iran," says Ter-Matevosyan, who adds that some Azerbaijani nationalists consider the area to be theirs.

In one clear example, he says that some nationalists want to rename Azerbaijan "Northern Azerbaijan," implying that there is a Southern Azerbaijan in Iran. According to Brenda Shaffer, Iran is simply not ready to sacrifice economic safety or security for a religious issue.

"Despite formally declaring itself the supporter of oppressed Muslims, it never supports Muslims in conflicts that require Tehran [to take] a concrete risk or sacrifice of economic or security resources. Look, for instance, at Iran's excellent relationship with China. Despite the oppression and mass incarceration of Muslim Uighurs and Beijing's attempt to eradicate their Islamic practices, Iran continues to deepen its cooperation with China," Shaffer says.

"In addition, Iran has great relations with Russia, despite Moscow's killing of thousands of Muslim Chechens, including during the height of the Chechen Wars. In this context, one needs to view Iran's relations with Armenia. Geopolitical interests bring Tehran to side with Armenia: Armenia is close with Russia and helps Iran evade sanctions, while Azerbaijan is close to Turkey and Israel and strictly complies with the sanctions on Iran," she says and points out that Iran also benefits by selling natural gas to Armenia.

## Problems are Nothing New

Armenia and Azerbaijan have clashed over Nagorno-Karabakh for many years, and fought a bloody war after the break-up of the Soviet Union. The stormy relationship between Iran and Azerbaijan also has a history. Ter-Matevosyan says Azerbaijan has been angry about Iran's economic deals with Armenia for many years and that Azerbaijani voices accuse Iran of placing a higher value on its financial concerns than on its religious ones.

Iran was quick to recognize Azerbaijani independence back in 1991, but early on during the war between Azerbaijan and Armenia in the years that followed, Iran threatened Azerbaijan with military intervention after provocative statements from Baku.

Since then, the relationship between Iran and Azerbaijan has improved at times and deteriorated at others. Back in 2007, Azerbaijan, for example, accused Iranian state television of trying to manipulate its population.

In 2012, Iran temporarily withdrew its ambassador to Azerbaijan after increasing concerns about the Azerbaijani relationship with Israel and after demonstrations broke out against Iran in Baku, as Reuters reported. People went out on the streets in Baku after Iranian figures criticized Azerbaijan for

its decision to host the Eurovision Song Contest, calling it "a gay parade," and labeled the Azerbaijani government anti-Islamic.

According to Shaffer, it is unlikely that Azerbaijan and Iran will suddenly become friends.

"Azerbaijan tries to maintain polite relations with Iran, but almost 30 years of Iranian support for Armenia can't just be erased from the ledger. Also, Iran has operated domestically in Azerbaijan against the secular nature of the government and school system, including support for terrorist elements promoting radical Islam. Also, Azerbaijan complies with US sanctions on Iran, and also maintains close strategic cooperation with Israel," Shaffer adds.

She also points out that Iran is increasingly worried about anti-government protests. Among these there have been several demonstrations staged by the Azerbaijani minority in Iran.

"However, with the emergence of the war between Armenia and Azerbaijan in July this year and its continuation in late September, many ethnic Azerbaijanis in Iran have been incensed by Tehran's support for Armenia and [are] coming out to protest. This creates additional pressure on the regime and a threat to its continuity," she says.

<https://iranwire.com/en/features/7803>

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## ALUMNI:

### State Sen. Questions Top DHS Administrator's Qualifications

(APG Wisconsin 15 Oct 20) ... Benjamin Yount

One Wisconsin state senator wants to know what a woman who went to college to be an art teacher knows about infectious diseases.

Republican Sen. Steve Nass, R-Whitewater demanded answers from Department of Health Services Secretary-designee Andrea Palm about Stephanie Smiley, who heads the state's Bureau of Communicable Diseases.

"Gov. [Tony] Evers has repeatedly told the public that his administration is 'following the science' and relying on experts," Nass said Wednesday. "However, the person in charge of the state's daily fight against COVID-19 has no medical or scientific training or degrees."

Smiley currently holds both the job of Bureau of Communicable Diseases director and the interim administrator of the Division of Public Health. Nass says Smiley got a degree in art teacher education from UW-Madison and **a masters in Homeland Security Studies from the Naval Postgraduate School**, but has no formal medical or scientific education.

"Ms. Smiley leads the Communicable Diseases Bureau but has no education, training or experiences that would seem to make her qualified to serve in that role," Nass said. "She is also serving as the overall Administrator for the Division of Public Health and clearly lacks any known basis for serving in that role, as well."

Nass said the Department of Health Services defines the job of the Bureau of Communicable Diseases as:

"Promotes efforts to prevent and control communicable diseases among Wisconsin citizens. Implements surveillance, control, and prevention measures; assists local health departments, health care providers, and citizens to prevent and control the spread of communicable diseases; maintains a statewide surveillance system; assists in early identification and intervention of communicable diseases; and informs the public about ways to prevent and control communicable diseases."

Nass said Smiley was the communications director at DHS before her promotions. He wants to know why and how those promotions happened.

"Governor Evers and DHS Secretary-Designee Palm need to answer serious questions regarding the personnel at DHS serving in vital roles without the appropriate education, training or experience," Nass said.



[https://www.apg-wi.com/news/state/state-sen-questions-top-dhs-administrator-s-qualifications/article\\_3c5b6be8-43f7-57f7-a3f9-b8e8e20fea76.html](https://www.apg-wi.com/news/state/state-sen-questions-top-dhs-administrator-s-qualifications/article_3c5b6be8-43f7-57f7-a3f9-b8e8e20fea76.html)

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## **Salas Named for Belen City Manager**

(*El Defensor Chieftain* 15 Oct 20) ... Clara Garcia

A candidate running for the District 2 seat on the Socorro County Commission was appointed as the new city manager in Belen.

Belen Mayor Jerah Cordova appointed Retired Gen. Andrew Salas, of Bernardo, located in northern Socorro County, to the position last week, and the council unanimously voted to approve the appointment.

Salas, a Republican, is running against Democrat Craig Secatero, a member of the Alamo community. The retired New Mexico National Guard general said he decided to run for the seat, currently held by his wife, Martha, who has served in the position for eight years.

“My wife, Martha, is termed out, and I had been looking to see if someone was interested in following her,” Salas said.

When he couldn’t find anyone run, Salas decided to throw his hat into the political ring. When asked if he thought it could be a conflict of interest being Belen’s city manager and a Socorro County commissioner if elected, Salas said he didn’t think so.

“I’m in full agreement with the mayor and the city council that my heart and soul is with the city manager’s position,” Salas said in an interview with the Valencia County News-Bulletin. “After carefully analyzing what a commissioner’s duties are, I don’t believe there is a conflict of interest if elected. In fact, I think it would be complementary arrangement if elected.”

Cordova agrees, saying he doesn’t have any concerns about Salas running for a seat on the neighboring county commission.

“I don’t have any concern whatsoever,” Cordova said. “There’s not a whole lot of interaction between what’s going on in Socorro and what’s happening up here. I think it will be a good relationship.”

And if Salas loses the race, he says he has full confidence in Secatero’s abilities to serve District 2 and the county.

“He’s a wonderful guy, a great member of the Alamo community,” Salas said of Secatero. “I told him if he does win, I would do anything I could to help him.”

Salas was born and raised in Bernardo, graduated from Belen High School, and spent his entire life in northern Socorro County except during his military assignments.

He continues to work the family farm, which they raise forage for animals.

Salas served 38 years in the New Mexico National Guard, and rose to the ranks of brigadier general, a position he was appointed to by former Gov. Susanna Martinez.

After leaving the Guard, Salas served in the southern command for the U.S. Air Force overseeing the nation’s cooperation of military in Central and South America.

For several months after, he was the chief executive officer for the Alamo Navajo School Board, Inc. He then went to Washington, D.C., to work as a special assistant to the chief of the National Guard Bureau.

Salas also holds a **master’s degree in government studies and international relations from the Naval Post Graduate School.**

[http://www.dchieftain.com/news/salas-named-for-belen-city-manager/article\\_da193c16-0e37-11eb-9e8d-f77ea71fc6ac.html](http://www.dchieftain.com/news/salas-named-for-belen-city-manager/article_da193c16-0e37-11eb-9e8d-f77ea71fc6ac.html)

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