Whether a deforestation study by geographical science experts or the creation of a low-cost biofuel in an engineering lab, research becomes valuable only when it’s put into use. That’s where the School of Public Policy (SPP) can play a bigger role in the university in coming years, says new Dean Robert Orr.

“We need to make sure that research actually gets used and gets into the decision-making process,” says Orr, who came to the university from the United Nations (UN) in Fall 2014. “It makes the entire research agenda that much more valuable.”

Several major areas are on his radar, including climate change, cybersecurity and alternative energy, but he says all global challenges require an interdisciplinary approach. At Maryland, he hopes to create “policy entrepreneurs,” or people who take a problem-centric view and “bring together different people and institutions that might not otherwise engage with each other.”

Orr is particularly passionate about climate change, as he’s still the primary advisor to the UN secretary-general on the subject. He was in Lima, Peru, in December as part of an international climate change conference.

“So much of the climate work that has been done is of a technical nature, on climate systems and the science of climate change,” Orr says. “We need that to craft good policy, but the amount of research that has gone into policymaking is much less.”

He believes this is an area UMD and SPP can take the lead, especially in adaptation and resilience. Societies need to build their economies to survive major environmental shocks, like powerful storms or droughts, and Maryland can be on the front lines to help them do that, whether it’s working with a local town, advising the White House or participating in a global conference, Orr says. In December, government pledges to the new Green Climate Fund (addressing both climate mitigation and adaptation needs) surpassed the initial $10 billion goal, which means significant new money will provide new opportunities for UMD researchers beginning in 2015.

In cybersecurity, “many of the questions bedeviling us are not of a technical nature—they’re of a policy nature,” he says. The university, already deeply involved in cybersecurity research, is well positioned near Washington, D.C. and government agencies to bridge some of the divides.

At the same time, governments alone don’t influence and shape policy. It’s also nonprofit and philanthropic actors, with business and private finance actors. It’s about combining all of these finance actors. It’s about combining all of these philanthropic actors, with business and private financial actors. It’s about combining all of these finance actors. It’s about combining all of these philanthropic actors, with business and private finance actors.

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He’s seen firsthand at the UN how these different players change and improve policy on a range of issues throughout the world.

The establishment of the Center for Philanthropy and Nonprofit Leadership several years ago put SPP and UMD on “the cutting edge,” he says. “To stay there, we’ll have to continue to invest in philanthropy and nonprofit work,” especially as it relates to influencing policymaking.

Threat of Space Debris Brings Together Researchers, Policymakers

The increasing volume of orbiting space debris could threaten space-based communications, weather forecasting and commerce. The new Center for Orbital Debris Education and Research (CODER), led by aerospace engineering Associate Professor Ray Sedwick, hosted its first workshop in November, bringing together stakeholders from academia, industry and government to collaborate and promote the long-term goal of developing policies, laws and systems to effectively mitigate the effects of orbital debris. These millions of objects, including rocket boosters, fuel tanks, screws, paint flecks, even a spatula, zoom around the Earth at speeds of up to 25,000 mph.

At left: Objects in Earth’s orbit currently being tracked by NASA. Just five percent of these are satellites; the rest is orbital debris.

Fighting Ebola and HIV

A chicken virus used for more than half a century to vaccinate poultry could hold promise for fighting everything from Ebola—which killed more than 7,500 people worldwide in 2014—to polio.

Siba Samal, associate dean of the Virginia-Maryland Regional College of Veterinary Medicine and chair of the UMD Department of Veterinary Medicine, leads the field in his work with the Newcastle Disease Virus (NDV). Through genetic modification, he and his fellow researchers have created a harmless version of the virus, into which they can insert a gene from a human disease to potentially create a vaccine.

“There are a lot of advantages” to NDV, he says. While it’s safe because humans don’t get sick from it, it can still replicate quickly in humans, since people also don’t have any antibodies to reject it. NDV produces an immune response in areas like the respiratory or intestinal tract, several of the body’s first lines of defense. With just six genes, instead of the hundreds found in the herpes virus, for example, also used as a vaccine vector, it’s easier to see the impact when a gene from a human disease is inserted into it. And since NDV can be grown in chicken eggs, instead of an expensive cell culture system, it’s more cost-effective.

Though Ebola became a global crisis last year, Samal has been working since 2009 with colleagues at the National Institutes of Health and at the University of Texas Medical Branch at Galveston to create an Ebola vaccine. Ebola is tricky to tackle, because it has at least five major strains, meaning it requires multiple vaccines. NDV is a good potential vector because it also has many types, so Samal and his team can test out various combinations.

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A New Approach to Journalism

Coding may be just as important a skill as reporting and writing for a new generation of journalists, as shown through the proliferation and popularity of sites like Nate Silver’s FiveThirtyEight, The New York Times’ “The Upshot” blog and Bloomberg’s “Bloomberg Visual Data.”

“We need people who can take a mess of data, analyze it, find something interesting and know how to communicate it,” says Nick Diakopoulos, a new assistant professor in the Philip Merrill College of Journalism who is focused on computational journalism.

Through a Knight Foundation grant, Diakopoulos is exploring how algorithms can identify high-quality comments on news sites. “It’s important because some sites are shutting off comments online, if they’re low-quality or people are being uncivil,” he says. He’s data-mining the Times site to determine ways to rank comments.

Diakopoulos is also working with undergraduates to investigate Uber, the popular taxi and rideshare service that connects riders and drivers through a smartphone app.

“The issue with the algorithms (behind the app) is that they’re totally opaque,” he says. Uber regularly uses “surge pricing,” which can charge riders several times the regular amount at peak times. He believes riders deserve more information on Uber’s pricing patterns, including when, where and why they’re increasing, and whether they’re targeting certain customers, like ones who previously paid higher prices.

He and his students started gathering and analyzing pricing data from Uber’s application programming interface, released in August, to make these decisions more transparent.

“There’s a huge demand for these kind of skills,” he says. He’s working to improve the Merrill College curriculum by offering more computational journalism courses, including his new “Storytelling with Data Visualization” class this spring.