

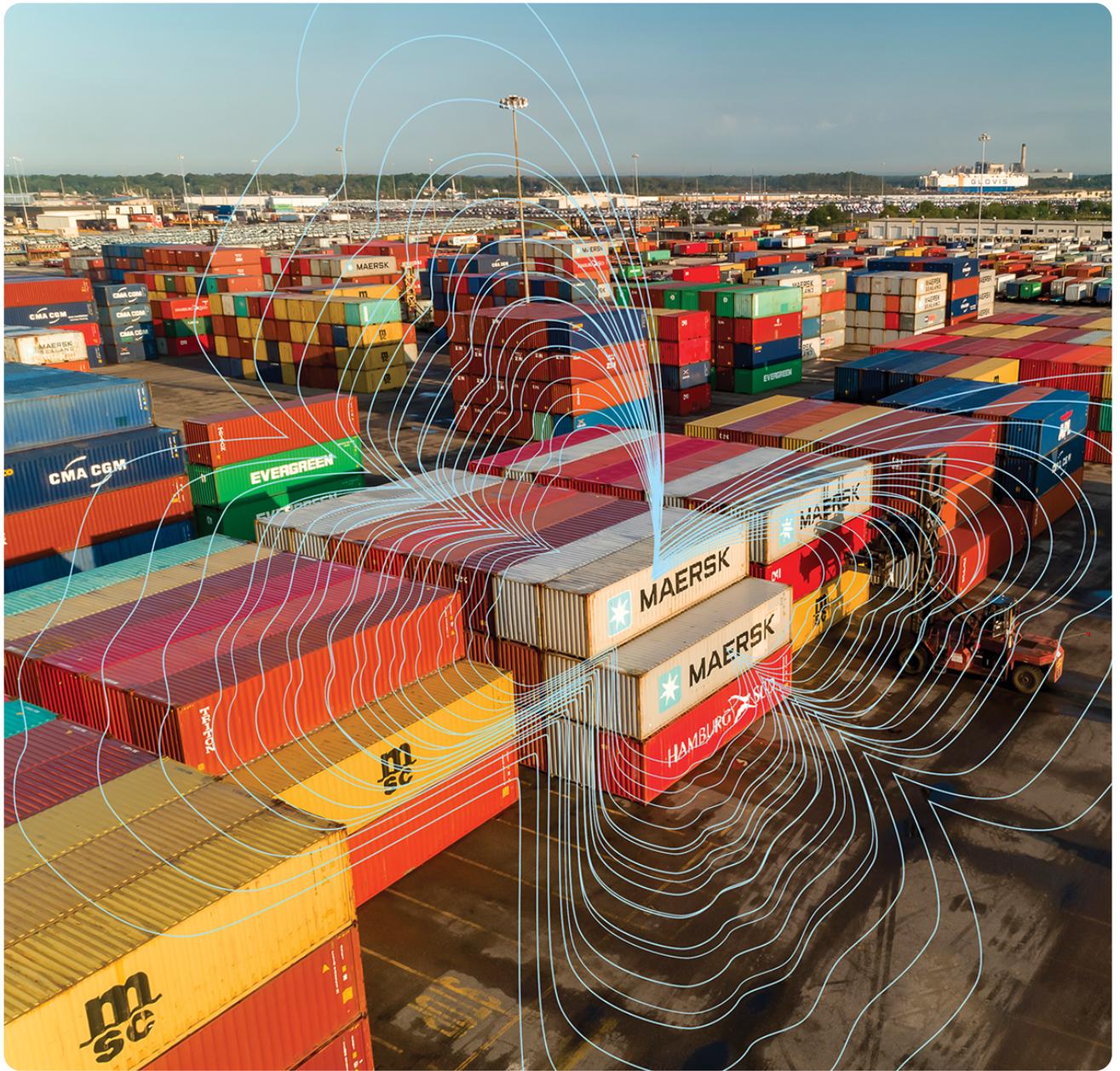


**Science
Societies**

3 tips for adapting your research to COVID-19 supply chain disruptions

By DJ McCauley

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The Jacksonville Port Authority (JAXPORT) in 2021. Photo courtesy of JAXPORT/Flickr.2

The COVID-19 pandemic exacerbated supply chain issues, creating supply and demand shocks that stressed the system. Fallen prey to rising prices, backorders, and shortages of essential equipment, researchers are making

changes to their workflow. Early career members and a supply chain expert, Gad Allon, offer insights for handling supply chain disruptions.

“Does the flap of a butterfly’s wings in Brazil set off a tornado in Texas?” physicist Edward Lorenz asked at the **1972 meeting** of the American Association for the Advancement of Science. He asked not to show that there are such tornado-inducing insect wings, but to point out that even small shifts can result in major disruptions in weather systems, making it incredibly hard to forecast.

Today, we’re amid a forecasting crisis of an altogether different kind. Supply chains—systems that bring together separate components to create products and then get those products to consumers—are in the public eye. Even a localized disruption (say, a drought in Taiwan) can cannonball into major ripples down the line (like making computer processing units, or CPUs, prohibitively expensive worldwide).

“COVID-19 is doing for supply chains what the **2008 recession** did for mortgage-backed securities,” **Gad Allon** says. “It wasn’t until people lost their homes that you started to pay attention. Now for researchers, supply chains are interrupting their ability to do research, and it’s becoming a priority.”

Allon serves as the Director of the Jerome Fisher Program in Management & Technology at the University of Pennsylvania. His research focuses on supply chains. With headlines spanning 2020’s **toilet paper shortages** to the spring 2021 blockage of

the [Suez Canal](#), Allon's expertise is in vogue.

Allon chimes in with advice for handling supply chain disruptions when planning your research studies. Early career Societies members Chrissie Segars (Extension Turfgrass Specialist at Texas A&M) and Ryan Stewart (Associate Professor in the School of Plant and Environmental Sciences at Virginia Tech) offer their experience and advice, too. Together they have three tips to handle supply chain disruptions and keep your research running smoothly.

1. Create Connections

Segars's soil moisture probe broke down during a turfgrass drought trial in the summer of 2020. She had no backup.

"When it started having technical issues, I contacted the company, and they needed to replace one part; but the part was on backorder," Segars says. Without a soil moisture probe, a summer's worth of data could go uncollected. "You could say it was our fault for not having a backup, but I guess you think, hey, if this starts messing up, we can get it fixed really quickly, no problem."

Luckily, Segars had recently helped a local golf course with an herbicide tolerance trial—she'd volunteered at a big tournament there, too. She gave them a call, and they were able to lend her their spare soil moisture probe until she could get hers repaired.

"That's where developing those relationships comes in—getting out, meeting people," Segars says. "People are more than willing to help you if they can."

Other researchers spoke to the usefulness of their networks during lean times, too. Some mentioned that resilience really does pay off; asking colleagues or contacts to see if they had extra essential supplies like personal protective equipment (PPE)

during the shortages early in 2020 meant some researchers were able to meet their needs long before institutions were able to get more in stock.

So build connections, particularly if you're early on in your career. Chat with your colleagues. Offer a helping hand if you can, and don't be afraid to ask for help if you need it.

2. Peel Back a Layer



The contacts and relationships you develop in your career can really help keep your research running smoothly when supply chain disruptions occur. Photo courtesy of Angelia Seyfferth (originally submitted with article <https://doi.org/10.1002/csan.20070>).

the same component. Increasing demand for products that share that component can turn into big shocks to the supply chain.

If you can find out where your supplier is getting its products, you can better understand whether the cost might rise and how long it could take to get to you.

If you're dealing with an equipment breakdown, there's not much you can do besides wait it out or hope someone has a spare. But how can you plan for an uncertain future, particularly when costs start rising?

"Go deeper. Look at where your supplier is getting the product from," Allon advises. Much of the increased costs for products come down to the incredible backlog of shipping containers and product left at ports. The rising cost of shipping is handed on to suppliers, which suppliers pass on to consumers. Plus, certain types of items use

“You don’t need to go in 15 layers, just one more,” Allon explains. “If you see that one vendor has a product that’s manufactured locally, you might have to pay a little bit more for it, but you’ll get more resilience, more security. If you see the price of shipping go up, you won’t have to worry as much.”

Staying abreast of trends can give you a good idea of which items are in demand. It can also show you where changes in the supply chain might cause higher prices later on. Allon recommends skimming a daily newsletter like Bloomberg’s [Supply Lines](#) to stay up-to-date on supply chain issues.

When it comes time to create a budget and order materials, it might mean looking beyond your typical vendors. Allon recommends that if supplies or equipment make up a large chunk of your budget—20 to 30%—consider getting multiple quotes from multiple suppliers before putting in orders.

“You’d be surprised—most firms don’t even find multiple options for vendors,” Allon says. “But if a big part of your budget is equipment, getting a sense of the price of supplies from multiple vendors could be a skill you need for the next few years.”

3. Get Self-Sufficient

Unfortunately, our supply chain woes aren’t going away any time soon. COVID-19 revealed the shortcomings of a system with many layers, many players, and lots of places to cut costs.

“Essentially, companies relied on the other players in the chain to hedge their risk as they reduced their own inventories,” Allon says. In the process of getting “lean,” individual links in the supply chain lost their ability to handle fluctuations in demand. Many companies not only cut back but started outsourcing their manufacturing. They also started “offshoring”—moving to different countries to decrease costs. Combined,

these factors made the supply chain more and more complex and less transparent.

One way to bypass the opaque supply chain is to plan ahead and become more self-sufficient. For example, Stewart's lab at Virginia Tech is now building its capability to run soil test samples in-house that they would have ordinarily shipped out to national soil-testing laboratories.

"For some places, there's a backlog of as much as a year to get these tests done," Stewart says. "That was a real impetus for us to get this lab set up. We're not a full soil health lab, but now we have the common instruments for students and faculty members to use."



One way to bypass the opaque supply chain is to plan ahead and become more self-sufficient. One example might be running soil test samples in-house that would have ordinarily shipped out to national soil-testing laboratories. Photo by Pratima Poudel (originally submitted

So, if you have the means, find ways to adapt, running tests in your own space, on your own instruments.

with article
<https://doi.org/10.1002/csan.20556>).

The Human Element

Of course, it goes without saying that the COVID-19 pandemic has taken a toll on us all. But it's also served to remind us that we can do a great deal of positive, impressive research under unfavorable conditions.

Remember that you and your research team are an important part of that. If possible, think ahead: how can you design research that meets both your scientific and personal goals? How can you create laboratory and field conditions that work for your tools, your time, your team's time?

Let this serve as a friendly reminder: there is a silver lining. Though the supply chain issues we've faced over the past year are still causing ripples, like that butterfly in Brazil, it's also a critical checkpoint. In such uncertain times, it would do us all well to remember that we do not have to do it all, but we should do what we can.

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