

# Data from space for sustainability

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**Theresa Condor,  
EVP & GM Space Services and Earth Intelligence,  
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Reading Time: 4 minutes

Data is the new gold, and it can even come from space. Implementing a grid of nano-satellites in space provides essential data for aviation and logistics industries, the weather industry, and Earth Intelligence for research purposes. Compiling detailed data sets can make processes more efficient, and CO<sub>2</sub> emissions can be optimized. Now it is even possible for non-space companies to place an application on a satellite and thus get new perspectives on business models through earth-spanning data, says Theresa Condor, EVP & GM Space Services and Earth Intelligence, Spire.

*In the spirit of the [taskfarm concept](#) Theresa Condor was invited to the interview by [Helmut Blocher](#), CEO Succus GmbH. She will be speaking at the [Austrian Innovation Forum](#) in Vienna on October 14-15, 2021.*

**How does collecting data from space support the Sustainable Development Goals?**

**Theresa Condor:** I think several factors drive the heavy emphasis on sustainability and a changing climate, thus make the space sector relevant for that theme. One is the miniaturization of the technology and the pace of innovation at which the development is happening. Due to miniaturization, we now can put many, many satellites in orbit to have consistent coverage. The nearly real-time time coverage across the whole earth has been made possible through nano-

satellites. On the other hand, we see the rapid technology innovation, at a pace of approximately 10x improvement every five years. A lot of the computing power that we have on earth we can now apply in orbit. That means that you can start running any machine learning algorithms on orbit directly. Before, you had to monitor, download all the data, use computers on earth and then decide on those algorithms. That has changed. You can do everything automatically. In conjunction with another technological innovation concerning optical inter-satellite links, this development enables the connection of all the supercomputers in orbit in the network.

**Is all the technology on earth usable to the same extent in space?**

**Theresa Condor:** The satellite sector is in that regard in the capabilities of personal computers in the early nineties. So a lot of innovation is still to come. But the essential factors driving the space sector are highly relevant to the topic of sustainability and climate.

**The application of machine learning algorithms provides different possibilities and business cases for data usage. Is this development reflected in demand for your service?**

**Theresa Condor:** Yes, we see new business models that are coming into focus. I think this development is driven by some of the work that we're doing at Spire through what we call space-as-a-service. Meaning we are building satellites, deploying infrastructure into space, and operate them through space-as-a-service. Providing space infrastructure allows other organizations and governments to deploy applications without dealing with any underlying infrastructure. This service is roughly comparable to companies deploying applications into the cloud by using the infrastructure of Amazon AWS and Google Cloud, or any cloud providers. Such a development has started to roll out related to space as well. Companies that don't consider themselves a space company can

make usage of space assets.

**How many satellites do you have in space? Do you have full coverage over the earth already?**

**Theresa Condor:** We have over 100 satellites in orbit right now. I'm not sure of the exact number at the moment because there are always launches happening, but it's well over 100. We generally have about 15-minute coverage listening to the earth with all the satellites in orbit. This consistent coverage was the prerequisite for the deployment of technologies like inter-satellite-connectivity.

**Do you have an example or use case of how data from space facilitated a strategical change regarding sustainability?**

**Theresa Condor:** The result of a more accurate level of knowledge through space data has direct effect on the decision-making. This specific knowledge helps to increase the operational efficiency of supply chains, for example. This is calculated by using different types of satellite information. To reduce the fuel consumption of vessels, you can use a combination of weather data measurements, tracking information, and analytics that can help ships know in a better way which route they should be traveling. Spending less money on bunker fuel generally means they have fewer emissions. Using extensive data helps to determine their travel speed. The faster they go, the more energy they burn. The data provides information on the port they are advancing. If it is congested, e.g., they would therefore have to allow for a waiting time of three days anyway before redeeming their charge. It is more efficient, cost-effective, and emits less CO<sub>2</sub> to route optimally for the weather. This way, they arrive at their destination at the right time to berth and unload immediately.

In another use case, the space data provides for food security. One example is Global Fishing Watch that uses

tracking information from satellites that helps to understand illegal fishing, monitor it, determine where it's happening, and identify suspicious vessels.

Another example would be monitoring power lines to understand vegetation growth around power lines in remote areas, which tend to be a risk for wildfires. The vegetation was a cause of certain big wildfires in California and for which the California utility was held responsible.

You can also use space monitoring to monitor wildfires themselves as they're happening. And it is possible to use some measurements made from satellites, such as soil moisture, to input into algorithms and predict where wildfires will potentially start.

It shows that using data from satellites becomes gradually more important for decision-making that businesses and governments need to make around response to climate.

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**About:**

*As part of the early team at Spire, Theresa Condor focused on building the initial business case and then taking a lead role in business development. Theresa now leads Spire's engagement on special projects related to space-as-a-service, satellite data licensing policy, and new markets. Theresa sits on the Board of Directors at Spire. Prior to Spire, Theresa spent the past decade working in emerging markets.*