CONTRIBUTOR CONTENT

# Environmental Evidence from the Sky: Inside Glen Gustafson's Aerial Interpretation Work

*Members of the editorial and news staff of the USA TODAY Network were not involved in the creation of this content.*

**Matthew Kayser** Contributor
Sept. 8, 2025, 4:18 p.m. ET


Glen Gustafson engaged in refinery environmental fieldwork

When Glen Gustafson first encountered aerial photography, it was in the 1960s, and the US Air Force was training him in the highly specialized craft of aerial interpretation. His journey into the craft began as a four-year enlistment, which turned into a lifelong pursuit, and one that has spanned military intelligence, academia, and the founding of his own firm, Environmental Image Group, Inc.

Over the decades, Gustafson has seen the discipline transform alongside technology itself, shifting from rolls of film and micro-stereoscopes to high-resolution digital imagery and advanced enhancement software. Yet, despite all the change, one constant remains: the irreplaceable role of human judgment.

For much of the 20th century, Gustafson witnessed how the work was done almost entirely on film. Analysts like him would pore over positive duplicates of negatives, examining them under a micro-stereoscope to see sites in three dimensions. This stereo effect was crucial, allowing interpreters to detect subtle details, from industrial structures to environmental disturbances. "Up until the turn of the century, all serious work was done from aerial film," Gustafson recalls. "We would study sites in 3D, in great detail, and that was how interpretation was done."

But around the early 2000s, film photography fell out of use. Photo labs shuttered, film processing became scarce, and an entire industry faced disruption. For Gustafson, this wasn't the end of the road but the beginning of reinvention. The question was how to recreate the 3D stereo effect with digital images, without spending thousands of dollars on state-of-the-art systems, a scenario that many didn't even consider.


Glen Gustafson doing Catalina Conservancy GPS Fieldwork

His solution was deceptively simple: lay a 4K monitor flat on a desk, position a pocket stereoscope over it, and align left and right-eye images to achieve the same three-dimensional effect once possible only with film. “If the scans are done carefully, we can see just as much detail in digital imagery as we could in the original film,” he explains.

Not only did this preserve the accuracy of interpretation, but digital technology opened new possibilities. Unlike film, digital images could be enhanced in real time. With a plethora of image editing software, Gustafson could improve clarity and extract information previously obscured, for example, in shadow areas.
Today, Gustafson applies his expertise to a very different battlefield: environmental law. Through Environmental Image Group, he provides evidence in cases where pollution has contaminated the land and water, often long after the company responsible has disappeared.

“Most of my work is legal,” he says. “If there has been a highly polluted industrial site, the cleanup is terribly expensive. In fact, I have seen firsthand how insurance firms will push the blame to one another,” He recalls a small case in Alabama where a factory had routinely dumped solvents in its gravel driveway, which seeped into groundwater. Years later, families nearby discovered chemicals in their wells that caused illness. The factory was long gone, but the site’s contamination triggered a legal case. The cost to remediate a driveway just 15 meters long was staggering.

Gustafson has been in cases where dozens of such insurance firms have been mediating over when the pollution occurred, and which insurance policy was in force at the time. Aerial photography can clarify many such situations without ambiguity. On the other hand, eyewitness accounts (from decades ago) are often inconsistent and unreliable.

After that case, Gustafson knew the scale could be far greater in other cases. “Aerial photography has been used to nail down abuses that are visible on the ground, waste pits overflowing, and find tanker trucks dumping chemicals,” he says. “It has also been used successfully to help resolve residential disputes and rural land use issues.”

His work helps establish when the damage would have occurred, which insurers were on the hook, and the extent of cleanup that would be required. Oftentimes, settlements could lead to significant sums. “It gives you an idea of how seriously this is taken,” he notes.

As with many fields, artificial intelligence looms over the conversation. Could machines one day replace human interpreters? Gustafson is skeptical, but certain. “AI could be incredibly useful for surface-level tasks, like searching coverage or picking out objects,” he says. “But the actual interpretation, the significance of a spill, a trench, or industrial waste, currently requires a human being.” Intuition, he emphasizes, is one of the qualities that cannot be taught to a machine. The ability to look at a less-than-perfect image and infer what’s happening on the ground is a skill honed through experience, not algorithms.

Beyond his business, Gustafson also spent almost three decades teaching at a prominent research university in Virginia, passing his expertise on to students, some of whom went on to careers in environmental monitoring, intelligence, and remote sensing. He encourages anyone interested in the field to study aerial photo interpretation and remote sensing, but also to pursue adjacent disciplines like agriculture, geology, or engineering. “If you align aerial interpretation with another area of expertise, you can make a real career of it,” he advises.

After more than half a century, Gustafson remains actively involved in his craft. Earlier this year, he provided expert testimony in a trial, underscoring that his expertise is as relevant as ever. What drives him is not personal recognition but the impact his analysis can have on communities, industries, and the environment.

The transition from film to digital may have reshaped the tools, but the core of the work remains rooted in judgment, responsibility, intuition, and a keen eye for detail; all characteristics Gustafson incorporates in every project at Environmental Image Group. Most of all, Gustafson asserts that aerial photography is not just about images from above; it is about what those images reveal about human activity on the ground, and how that evidence can guide justice and accountability.