*Unmanned Aircraft Systems Uses Around the World  
Current and Potential Use of UAS*

**U.S. Domestic Use:**

**Enhancing Public Safety**

•**Mesa County Sheriff’s** Department uses a Draganflyer X6 helicopter for search and rescue missions in Colorado.

•UAS can help firefighters, crime fighters and search and rescue operations

•**St. Louis Police** are using Unmanned Systems to help fight cities crime (2013).

•The **U.S. Customs and Border Patrol (CBP)** use unmanned systems to patrol the U.S.-Mexico border, helping prevent drug smuggling and potential terrorist threats. The UAS monitor areas, which would take agents on the ground days to reach.

• **CBP** arrested 26 drug smugglers on the Arizona-Mexico border (2012)

• The **U.S. Coast Guard** recently conducted its first narcotics interdiction with the support of UAS when authorities confiscated more than 560 kilograms of cocaine off a go-fast boat in the eastern Pacific Ocean. (2013)

•**Mesa County Sheriff’s Department** uses UAS to help firefighters determine structural integrity and origins of a church fire.

•Local law enforcement officials use UAS in their efforts to find a missing mountain biker who was stranded and injured in the Lincoln National Forest in **New Mexico** (2013)

• **Oklahoma State Univeristy** students created a UAS designed to help with search and rescue missions (2014)

• **University of Cincinnati** engineering researchers are finding new and unique approaches to developing autopilots for unmanned aerial vehicles and getting them into the hands of firefighters and other first responders. (2014)

•RTS labs announced a prototype for a lifeguard UAS to **rescue stranded swimmers**. The UAS, known as Pars, would be able to drop off life vests in the water and use a heat scanner to find people in the dark. (2014)

• Engineers operated an UAV to **survey the fire damage** on the remaining McClung warehouse building in Knoxville, after a fire ripped through the historic building. (2014)

• At a **quarry fire** near **New Haven, Conn**., firefighters used a quadcopter to see how close a fire had got to a stack of explosives. (2014)

**Enabling Scientific Research**

•The **USGS** partnered with **Boise State University and the University of Idaho** to use the Raven A to gather data on endangered pygmy rabbits which are threatened due to habitat loss. (2013)

•The **Idaho Department of Fish and Game** wants to use UAS for its frequent surveys salmon nests in streams and tributaries. In Aug 2010, a pilot and biologist were killed in an accident trying to do the survey.

•**NOAA** uses UAS for a seabird survey and tsunami debris survey off the Olympic Coast in Washington – finds UAS less obtrusive to the animals (2013)

•**NASA** flew over Tropical Storm Humberto to study how this "zombie" storm whirled back to life after dissipating over the Atlantic Ocean.

• **USGS** employs UAS not only to do scientific research, but to keep researchers safe. The leading causes of death for wildlife biologists on the job are not grizzly bear maulings or poisonous snakebites. The real cause: small-plane crashes. (2013)

• **University of Kansas** is at the sub-glacial Lake Whillans field camp on the Whillans Ice Stream in Antarctica testing a system they’ve devised that includes a 100-watt ice-penetrating radar carried aboard a small UAV. (2014)

• Arch Aerial designed a UAS for use by archaeologists that is made from 3D printed parts. The UAS has been used in **Belize and Italy**, and discovered structures that were not previously known because they were not visible from the ground. (2014)

• Nevada-based Desert Research Institute developed UAS which has the ability to release silver iodide into a storm and **generate additional rain or snowfall**. (2014)

• A camera attached to a quadcopter drone deployed over the Pacific captured a dolphin stampede last month off Southern California and provided several other unusual overhead views of ocean life. (2014)

• The collaboration with **UAS Iceland**, via **UAF's Alaska Center for Unmanned Aircraft Systems Integration**, will support arctic science, including glacier studies, volcano monitoring, marine mammal research and environmental observations. (2014)

•Scientists are using the latest technologies including UAS and robots to help them understand more about the Arctic and Antarctic. (2014)

• Unmanned aircraft captures 2,500-year-old petroglyphs in the Utah desert (2014)

**Supporting Agriculture**

•**Oregon** nurseries explore unmanned UAS technology to monitor potato fields

•**Virginia Tech** using UAS to research Fusarium, a group of fungi that includes devastating pathogens of plants and animals, which shows how these microbes travel through the air. Researchers now believe that with improvements on this preliminary research, there will be a better understanding about crop security, disease spread, and climate change.

•UAS can help farmers increase production, improve protection, and better management of their crops through the early detection of diseases, infestations, and other conditions that could affect optimal crop production. (2013)

•**University of New Hampshire** using UAS to help fight apple scab (2013)

•**Oregon State University** using UAS to survey potato crops (2013)

•**UAI International of Grand Forks, North Dakota, UA Vision of Dayton, Ohio, and the University of Dayton** led Institute for the Development and Commercialization of advanced Sensor Technology (IDCAST) are teaming to develop and market UAV-based solutions for agricultural applications.

• **Michigan State University** just acquired a drone that will fly over agricultural fields and monitor the health of farmers’ crops. (2013)

• Robert Blair, of **Blair Farms** in Kendrick, Idaho, has been using UAS since 2008 for his farm.

•In **Florida**, farmers and researchers have used small unmanned helicopters equipped with infrared cameras to monitor orange trees for the deadly citrus greening, a bacterial disease that kills the trees. Greening begins at the top of the tree. (2013)

• The **University of California - Davis**, professors have teamed up with Yamaha Motor Corp. USA to fly unmanned remote-controlled helicopters to spray vineyards and orchards. (2013)

• **The LSU AgCenter** says its researchers are trying to determine if using UAS can help farmers monitor their crops for potential problems. (2013)

**Helping the Environment**

• Performing ice cap studies in the Arctic to understand the freezing process at the end of the summer flying again at low altitude over the arctic sea. Then in a couple of years the Antarctic will also have the **NASA** Global Hawk flying over it replacing some of the manned riskier missions while allowing for greater collection time to understand the effects of climate change.

• UAS equipped with cameras is being used to observe sea ice coverage and monitor seal populations in the far north. The UAS is much cheaper to use than manned aircraft. It also eliminates the dangers to pilots and scientists flying in the fierce conditions of the Arctic.

•At **Jornada Experimental Range** in southern New Mexico, ongoing research is aimed at determining the utility of UAS for rangeland mapping and monitoring and developing an operational UAS-based remote sensing program for ecological applications.

•**Nicholls State University** in Thibodaux is using UAS to track coastal erosion and the health of Louisiana's barrier islands more closely. The islands are an important habitat for migratory birds and a front-line protection against hurricanes, but the islands have undergone heavy erosion as the state's coast has faded into the Gulf of Mexico.

•Researchers with the **USGS** and the **U.S. Fish and Wildlife Service** have used unmanned aircraft in three trials in Monte Vista to track endangered Sandhill Cranes and found them to be a safe alternative for both birds and scientists.

• **Stanford** researchers are using small unmanned aerial vehicles to map coral reefs off the coast. (2013)

• A solar-powered catamaran will be making its rounds in **the Kallang Basin**. It is helping clean the water ways throughout Singapore. (2013)

•UAV technology has made it easier than ever to keep tabs on magma- and ash-spewing mountains around the globe. Much of this technology allows researchers to keep way back (even watching volcanoes from space) while keeping a close eye on volcanic activity. (2013)

•A team of scientists from **University of Alaska – Fairbanks and NOAA** used UAS to study 53 sites of stellar sea lions and their dramatic decline. (2012)

•**Florida** using UAS to combat mosquito problem, using them to survey shallow pools of water. (2013)

• UAS will help researchers study a struggling **Hawaiian** tree species, the **wiliwili trees** on the Big Island (2014)

**Monitoring Climate**

• The AAI Aerosonde operating on science missions in the **Antarctic** in weather down to -30C happily continuing missions when manned aviation would have been perilous.

•**NASA** researchers have demonstrated the use of an unmanned aerial vehicle (UAV) to collect very low altitude airborne measurements of greenhouse gases at several sites in California and Nevada.

•**NASA**, which began a five-year mission to research changes in hurricane formation and intensity over the Atlantic Ocean, will send two unmanned aircraft over the ocean (2012)

• UAS flying in the boundary layer of hurricanes at about 500 ft over the water doing air sea interaction studies. Also flying Global Hawk aircraft over the tops of hurricanes for up to 20 hours continually monitoring its genesis to understand the formation.

• Nevada Desert Research Institute wants to use UAS for cloud seeding in drought-devastated areas (2014)

**Mitigating and Monitoring Disasters**

• UAS aircraft at **NASA** supported investigating the atmospheric rivers that push heavy rains into California and Oregon causing mudslides. These phenomena tend to come from Hawaii during La Nina years and affect the weather for months over the entire US

•Between March and July, for example, dozens of UAS missions were flown between **Grand Forks, N.D.**, and Columbia, Mo. The Predators provided first responders and engineers with live video and radar images of widespread flooding along the Soris, Red and Missouri rivers. (2011)

• **University of Hawaii** engineers have developed a robotic boat designed to explore disaster zones before rescuers and other emergency personnel. (2013)

•Only you can prevent forest fires," said Smokey the Bear, but only aerial UASs can monitor fires from the sky and keep firefighters safe. "Wildfire fatalities are often caused by a lack of situational awareness, and timely information can prevent deaths, especially among first responders," said Kelly Cohen of the **University of Cincinnati**

• Firefighters in California used the **NASA**’s Ikhana UAS to help get a better aerial view during wildfires in the state in 2008 as well as the Yosemite Wild Fire in September 2013

•**University of Colorado, University of Nebraska, Oklahoma State University and University of Oklahoma** are using UAS to study supercells of tornados

•**University of Florida** using small UAS to study hurricanes

•**University of Alaska – Fairbanks**’ UAS helped a Russian oil tanker navigate itself out of an ice floe while trying to deliver supplies to a town.

•**University of Tennessee** developed the Humanitarian Response Unmanned Aircraft System. The UAV is capable of delivering 1,800 lbs. of relief supplies to improvised runways or “wherever it is needed.”

• **Weber State University’s** UCAID has partnered with **Utah Valley University’s** (UVU) aviation science department to design a UAV Quadcopter for command and control during **wild fires**. (2013)

**Expanding Commercial Use**

•Researchers from the **University of Alaska Fairbanks’ Geophysical Institute** used UAS to help evaluate the ice and plan the emergency delivery of fuel in Nome, Alaska, harbor when a Russian oil tanker got stuck in the ice.

•**Conoco and Shell** in Alaska for oil exploration over dangerous areas in the Barents and Chukchi Seas

• CyberTech’s quadrotor flying inside an offshore oil rig which had exploded, establishing that the fire was out, when no other form of monitoring was possible due to the potential danger.

 • Aerial Photography Specialists flying quadrotors to inspect corrosion and wear on electricity towers in heavy bush, finding faults that might in the past have caused life-threatening bushfires.

•UAS can sweep in, circle a home, take a 360 degree view and give the potential buyer the kinds of details you’d be hard pressed to find in a MLS. (2013)

•The **Motion Picture Association** wants to use UAS for filming movies

•The **National Football League** has expressed replacing the Goodyear Blimps and tethered SkyCams with UAS to film games

•The **Professional Golf Association** wants to use UAS for major tournaments.

•Universities of **Tennessee, Kentucky** and **North Carolina** have used UAS to monitor football practice (2013)

•**DRNK Wines** in western Sonoma County is using UAS to map sections of its pinot noir vineyard that ripen earlier than others (2013)

•**Amazon** announced it would like to deliver packages using UAS with Air Prime in the next 5 years. 30 mins for deliveries in 10 mile radius of Amazon distribution center. (2013)

• Philadelphia **filmmaker** Kurtis Sensenig **choreographs** an aerial swarm of robot quadrotors to an electronic dance track. The automated chorus line flies in precise formations as individual drones break into flips and loops. (2014)

• A documentary used UAS to tell story of ex-gang members curbing violence in **Los Angeles**. (2014)

• A documentary about the **Battle of Gettysburg** was filmed by UAS and sponsored by kickstarter. (2014)

• **Michigan Technological University** researchers are outfitting high-tech unmanned aerial vehicles to inspect some less modern infrastructure elements: **gravel roads**.

• A number of scenes for the “**Wolf of Wall Street” movie** were shot with UAS (2014)

• MLB team **Washington Nationals** **and Miami Marlins** use UAS to film spring training practices (2014)

• **U.S. Polo Association** is currently using UAS to film its matches, which will be aired on NBC’s sport channel. (2014)

• AeroTrainer (an unmanned aerial video biotelemetry system) **to help athletes elevate their performance** while helping to prevent sports injuries, including concussions, cardiac incidents, and heat-related illnesses.

• **Mining companies** use UAS to create **3-D maps of mines** that software uses to calculate how much material has been removed, enabling companies to adjust production estimates. (2014)

**International Use:**

**Enhancing Public Safety**

* In **Israel** for police surveillance patrols
* **German** **police forces** have been using and experimenting with UAS since 2008 for their law enforcement efforts.
* **Australia** used UAS to patrol Australian beaches to help protect swimmers against dangerous currents. (2012)
* **Northern Ireland** Fire and Rescue Service is to test the potential use of UAS during large scale incidents such as flooding and gorse fires.
* **United Kingdom, France and the Netherlands**exploring UAS use to patrol its coastline and the English Channel
* **Canadian Mounties** find missing injured driver after car crash in snow bank. (2013)
* **Brazil** used UAS for security during the opening and closing of the Confederations Cup, this was a test run for using UAS during the World Cup in 2014
* **Mexican Marines** use UAV to nab a leader of Mexico's infamous Los Zetas gang (2013)
* **Mexico, Panama**, **Ecuador** and **Trinidad and Tobago** have also used them to monitor drug traffickers (2013) (2014)
* **Belarusian** Emergencies Ministry added UAS to its firefighting services (2013)
* The **Metropolitan Fire Brigade (Australia)** has begun trialing drones to help emergency crews deal with fires and other major incidents. The UAS will be up and running after one-year. (2013)
* **Chile** uses UAS for border concerns. (2013)
* **Colombia** has used UAS to monitor the Revolutionary Armed Forces of Colombia (FARC) and for drug trafficking surveillance and intelligence gathering. (2013)
* Peru uses UAS monitors guerillas, as the country watches the Apurimac area where the Sendero Luminoso operate. (2013)
* **Northern Ireland** Police use UAS for security alert search after pipe bomb thrown. (2013)
* **Northern Ireland** Police used UAS for security during G8 Summit (2013)
* **United Nations** recently started using UAS to monitor the situation in the north of The **Democratic Republic of Congo** (2013)
* The **Italian government** operated UAS in civilian airspace to aid in rescuing those attempting to cross the Mediterranean Sea in makeshift boats from Northern Africa to Italy. (2013)
* **Marseilles, France** is considering using UAS to patrol crime-torn neighborhoods. (2013)
* **Nigeria** has employed UAS to fight terrorism and other sophisticated crimes (2013)
* In response to a rising crime wave, the **Curacao Public Prosecutor (OM) and Curacao Police Corps (KPC)** will have access to a Dutch UAS during the first quarter of this year. (2014)
* Pondicherry (**India**) Police employed a “multicopter” UAS to trace the house in which 10-year-old was held captive in December. (2014)
* UAS have been deployed over the streets of **Bangkok** to give a birds-eye view of the tens of thousands of protesters taking to the streets to protest against the government. (2014)
* The **Andalusian firefighting authorities** (Infoca) have included UAS in their firefighting activities to provide night (dusk to dawn) real time information on the location of the wildfire. (2013)
* **Dubai Civil Defense**, the city's emergency management group, has ordered 15 "quadcopters" to patrol high-risk areas, monitor fires when they happen, and provide pictures for the media. Ahead of full crews going to a site, the drones will analyze the extent of the fire, allowing firefighters to be better prepared before they arrive. (2014)
* UAS are being used **to film earthquake-damaged properties** as demolition work progresses on Christchurch's Port Hills. The Canterbury Earthquake Recovery Authority (Cera) is using UAS as one of several means **for assessing properties that are too dangerous or difficult for workers to enter**. (2014)
* **Ecuador** to use UAS **to monitor the border with Colombia** to halt the traffic of illegal fuel and weapons
* **Sussex police (UK)** are trialling the use of UAS to beam live pictures to officers on the ground (2014)

**Enabling Scientific Research**

* Archaeologists in **Russia** are using small unmanned systems and their infrared cameras to construct a 3-D model of ancient burial mounds.
* National Geographic is using a micro-copter cam for an 18-month project documenting predators and prey in the **African Serengeti**.
* **University of Southampton (UK)** researchers are working on an unmanned aircraft that could help collect data about the atmosphere. Instead of having to climb mountains or travel to the Polar Regions, the scientists would be given a fleet of small, ultra-light gliders equipped with high-tech sensors to collect the data.
* **NASA Earth** science researchers last month traveled to Turrialba Volcano, near **San Jose, Costa Rica**, to fly a Dragon Eye UAV into the volcano’s sulfur dioxide plume and over its summit crater, to study Turrialba’s chemical environment. The project is designed to improve the remote-sensing capability of satellites and computer models of volcanic activity.
* **Peru**'s archaeologists turn to UAS to help protect and explore ancient ruins. Remote-controlled aircraft can save months of survey work and defend against growing threat from miners and squatters. (2013)
* Researchers are using UAS to explore the last great repositories of ice in **Greenland, Antarctica and Alaska.**
* Universities of Aberdeen and Bergen Geologists from **Norway** are using UAS to help extract more resources from the North Sea, using the latest visual technologies to identify oil-bearing rocks. (2014)
* Reading University (**UK**) Archeology Team excavated an Anglo-Saxon palace in Lyminge in Kent using a UAS to provide a 3D model of the site and was able to produce it in 30 minutes. (2013)

**Supporting Agriculture**

* In **Japan**, unmanned helicopters have taken over the spraying of crops for pest control, supplanting manned systems with a safer, more effective alternative.
* **European Union** exploring use of UAS to police farm subsidies and enforce environmental rules
* The **United Kingdom**’s airspace regulator exploring use of UAS to photograph and analyze agricultural land
* The **Beijing Agricultural Bureau** has spent 500,000 yuan ($81,490) introducing a homemade UAV for vegetable protection in Shunyi district. The vehicle will help treat and prevent wheat pests, according to the bureau.
* **Australian** researchers are developing UAS as small as a dinner plate and a fleet of eco-friendly robotic farmhands that could help cut down the amount of herbicide sprayed on crops.
* CATEC and CSIC, from **Spain**, participate together with partners from **Belgium** and the **Netherlands** in the community project FieldCopter that developed this system of collecting information through multispectral cameras equipped on UAS. The experiments have been conducted on **potato fields in Belgium** and the **Netherlands**, as well as in **vineyards in Spain**, where the prototype has been tested with excellent results and a clear advantage over satellite images, with an accuracy of 3 to 10 cm per pixel, compared to the meters accuracy given by satellites.
* Rothamsted Research, one of the **UK’s** foremost crops research and development centers, is researching the use of a UAS to collect data from experimental crop plots at each of the institute’s sites as well as at collaborating organizations’ trials. Rothamsted predicts this will give unique perspectives on crop growth and plant functioning, and will vastly extend capabilities for screening crops of different genetic background for performance, nutrition, stress, pathogen and disease responses. (2014)
* Darrin Lee became the first farmer in **Australia** to adopt UAV technology for his cropping program, using UAVs as a tool to reveal real-time nutrient status of crops, weed and insect populations in paddocks, germination status and sub-soil moisture availability. (2014)

**Helping the Environment**

* **Brazil’s** environmental police are deploying unmanned aerial vehicles (UAVs), or UASs, to monitor the country’s vast forest for illegal logging, drug trafficking and other crimes. (2013)
* The **Galapagos** UAV Project Team has partnered with the Galapagos National Park to develop a fleet of UAS to patrol the reserve to combat illegal fishing activities and unauthorized boat excursions.
* **Australia** utilizing the Scan Eagle to detect illegal fishing
* Aurora Flight Sciences is using the Skate UAS to study archeological sites in **Peru**
* **ASTRAEA** and partners in the **UK** are using BAE Systems aircraft as Flying Testbed for testing weather avoidance and sense and avoid technologies
* UAS are being used in **Kenya** to hunt elephant and rhino poachers. (2013)
* A mini helicopter has been used by researchers from Worcester to examine the threat to rare fish species posed by a dam on a **Chilean** river. (2012)
* **Australia** using UAS to identify Fire Ant Nests (2013)
* **Belize** and **Costa Rica** use UAS for conservation aims. (2013)
* UAVs have been used to combat bluefin tuna poaching off **Libya**
* UAVs used to combat whale hunting off **Japan**.
* **UK** using UAVs to monitor bog lands to help bring back the rare habitats.
* Conservationists in **Nepal, South Africa, Kenya and Tanzania** are to send UAS into the skies in the battle to save the Himalayan nation's endangered tigers and rhinos from poachers.
* A **New Zealand** university is using an UAS to help monitor the critically endangered Maui's dolphin.
* The **Queensland government (NZ)** will deploy UAVs on missions to more accurately drop payloads of herbicide on noxious weeds including prickly acacia, mesquite, parkinsonia and rubber vine to help halt their spread across the state. (2013)
* A team from Wake Forest University conducted climate research in **Peru's** tropical cloud forest which will allow researchers to see for the first time how individual canopies are functioning on a landscape level to fix carbon and release oxygen and water. (2013)
* **Chinese scientists** use UAS to calculate the number of yaks in the mountain wilderness of Xinjiang province, and to collect data about their habitat. (2013)
* The **National Tiger Conservation Authority (NTCA) in India** will use UAS and virtual fences to keep an eye on its dwindling tiger population. The trials for using the advanced technology to protect the big cats from poachers will begin in Panna Tiger Reserve, Madhya Pradesh, from January 2014. (2014)
* Rattled by 17 elephants being mowed down to death by a speeding train in Jalpaiguri district in West Bengal, **India** two months back,the railways and environment ministries have decided to consider deploying unmanned aerial vehicles (UAVs) to prevent such tragedies. Collaborating with them in this effort to save jumbos are the Indian Institutes of Technology (IITs), with IIT-Kanpur suggesting the use of UAVs to track elephant movements near rail tracks and warn train drivers in the vicinity to slow down. (2014)
* **Uganda Wildlife Authority (UWA)** has resolved to start using drones in the fight against the poaching of elephants and other protected animals in its national game parks.(2014)
* Wake Forest University UAS used in **Peru** to create photo mosaics for **ecological monitoring** of Peruvian cloud forest in the western Amazon. (2014)
* China to start using UAS to help disperse pollution in high populated areas by spraying smog-clearing chemicals into the sky (2014).
* A group of University of Colorado students, in collaboration with students from around the world, are designing a new UAS to help stop the **poaching of rhinoceroses** for their horns in South Africa. (2014)

**Mitigating and Monitoring Disasters**

* Researchers in **Costa Rica** have launched UAS into volcanic clouds in a groundbreaking bid to help predict major eruptions. (2013)
* Disaster response and radiation monitoring at the Fukushima nuclear plant in **Japan** (2011)
* The robotics team at the **University of Queensland** has developed low-cost, disposable and biodegradable UAS that can be used for environmental monitoring, sending back reports on conditions that could indicate an imminent bushfire.
* **India** deployed four UAVs to scan areas that rescue and relief workers have not been able to reach in the flood-hit Himalayan foothills in Uttarakhand in what was described as a pioneering operation. (2013)
* University of Bristol researchers have unveiled a large semi-autonomous UAS called the ARM system which could be used to provide visual and thermal monitoring of radiation after a release of nuclear material. (2013)
* **Japan** has presented a model of UAS that will monitor radiation background around the tsunami-crippled Fukushima Daiichi nuclear power plant in 2015 (2013)
* In **Tacloban, Philippines**, Danish firm Danoffice IT, has been providing UAS to U.N. agencies and several NGOs involved in the relief and response operations post Super Typhoon Haiyan. In Tacloban, the first thing that the UAS was used for was to identify where to best place the NGO camp. **Northrop Grumman’s Global Hawk** was also used in the Philippines for **humanitarian relief efforts**. German company **Ascending Technologies UAS AscTec Falcon 8** was used for **mapping**. (2013) (2014)
* CSIRO and Country Fire Authority are using drones to study the behaviour fast-moving grassfires in **Victoria, Aus. (2014)**

**Expanding Commercial Use**

* Off of **Angola** (Aerostar UAS) for patrol of oil rigs
* In **Nigeria** (leased and operated by foreign firms) for security patrols of oil fields
* In **Saudi Arabia** and **Kuwait** in patrolling along oil pipelines in remote areas since their UAV requirements appear to be more closely oriented towards patrol duties than military surveillance missions
* If the **German** Federal Aviation Authority and the European Union allow the civil use of UASs, an application would be in oil and gas monitoring
* **Russia, Angola, Nigeria, Germany, Saudi Arabia, Kuwait, Venezuela, United States**and others to use/using UAS to monitor and protect oil rigs, fields and pipelines
* **Germany**to employ UAS use for photography, map-making, surveillance of solar farms, industrial complexes and construction sites – 500 applications as of June 2012
* **Germany**’s University of Berlin developed UAS for delivering pizza
* **Australia** scholastic book store wants to deliver textbooks in Sydney with UAS (2013)
* **Dutch** Firm, Green X, using bird-like UAS around Schiphol Airport to scare away geese
* **Austrian** sky lit up by 50 quadrotor UAS for…art
* A **New Caledonia** mine uses UAS as a safer, faster and less expensive alternative to traditional surveying and mapping
* The Virtual Outcrop Geology (VOG) group at the **Norwegian** Centre for integrated petroleum research (CIPR) is using UAVs to seek out oil by helping geologists build 3D models of the terrain.
* **Germany’s DHL** flew a small, UAV from a pharmacy in Bonn, successfully carrying a 6.6 lb. package of medicine across the Rhine River. (2013)
* **Shanghai's SF Express** starts UAS delivery trials (2013)
* Researcher Max Nanao has used a DIJ Phantom to photograph a series of historic castles, buildings and monuments in the South of **France**. (2014)
* **Vancouver, B.C. Canada** real estate agents using UAS to show off properties.
* **El Salvador** newspaper La Prensa Grafica will use UAS to cover the El Salvador presidental elections (2014)
* UAS was used for 2 **topographic jobs** be carried out between 5.000 and 5.500m ASL covering around 10,000 Ha over the open pit mines of **Atacama**. (2013)
* **Columbian** government used UAS to inspect 100Km of **powerlines** running across the mountains of Medellin, which are in an area controlled by the local FARC guerrilla so their inspection by land or with manned aircraft proved to be very dangerous and inaccessible. (2013)
* In 2013 the first ever UAV inspection of **underground gas pipe lines** was carried out in **Spain**.
* UAS was used to film sporting events during the **2014 Sochi Winter** games in Russia. (2014)