**ESA and Climate Changes**

**Climate change is high on the global agenda. People are protesting and demanding action. The European Space Agency monitors our planet from space with the European Union’s Copernicus Sentinel satellites and the Earth Explorers gather data to understand how our planet works and the impact human activity is having. To tackle climate change, a global perspective is needed and this can be provided by satellites. Their data is key if we want to prepare ourselves for the consequences of change.**

|  |  |
| --- | --- |
| 10:00:00 | ESA leader |
| 10:00:10 | Title: **ESA AND CLIMATE CHANGES** |
| * Still. Climate marches across Europe - unknown date (3shots) * EXT. Aerial Atlantic Ocean – Summer 2018 – ESA * EXT. Coastline San Miguel, The Azores – summer 2018 – ESA (2shots) * EXT. desert landscape – unknown date- videoblocks * EXT. Aerial Glacier – unknown date – Videoblocks * Satellite image. Hurricane – unknown date – Videoblocks * Animation. Satellite image variation in CO2 emissions – unknown date – NASA * EXT. Car Exhaust – unknown date – Videoblocks * EXT. cow stable – unknown date – Videoblocks * EXT. Aerial Industrial area- unknown date – videoblocks * EXT. industrial chimney stack – unknown date - videoblocks | All over Europe climate change is a growing concern.  With global sea level rising between 16 and 20 centimeters since 1900 climate change is undeniably, having an effect on oceans, land surfaces, ice caps and weather patterns across the globe. It is well understood that climate change is caused by atmospheric gases such as carbon dioxide, CO2 and methane. When we look at these trace gasses there is an obvious correlation between human activity and climate change. |
| 10:00:42:01   * INT. Interview Josef Aschbacher – 2018 - Euronews | **ITW Josef Aschbacher, Director of Earth Observation Programmes, ESA**  What you see here on this graph is the CO2 concentrations of the atmosphere over the last 800,000 years. And you see that these values are going up and down in different phases. You see on the blue lines here are indicating ice ages, and the orange lines are indicating periods between ice ages, or periods when it's much warmer. But you also see that over the last 800,000 year the value was always below 300 parts per million. Suddenly, since the last century, it goes up very steep towards 400 parts per million, or even beyond. This is what we have today, this is the increase in carbon dioxide, drastically increasing over the past 100 years, caused by human beings." |
| 10:01:27:14   * Animation. Graphs and globe with carbon dioxide levels – 2018 – ESA * Animation. Sea ice concentration – 2018 – ESA * Animation. Sentinel 2 360° view in orbit – 2016 – ESA * Animation. Sentinel 3 fly-by in orbit – 2016 – ESA * Animation. Sentinel 5 fly-by in orbit – 2016 – ESA * Animation. SMOS fly-by in orbit – unknown date – ESA * Animation. North pole Changes in ice thickness from 2010 to 2012 – unknown date -ESA * Satellite image landsat-5 forests 1985 – ESA * Satellite image Sentinel-2 forests 2016 - ESA * Animation. Globe with mean sea-level rise. – 2017 – ESA * Animation. Globes with chlorophyll concentration and sea surface temperature – 2018 – ESA * Animation. Sentinel 1 fly-by in orbit – unknown date – ESA * Animation. Sentinel 3 scannering sea level – 2016 – ESA * INT. Paris climate summit 2015 – 2015 – unknown source (3shots) | In order to tackle climate change scientists and governments need reliable data to understand how our planet is changing. This can be provided by ESA, which monitors our planet from space. With 4 EU Copernicus Sentinel missions and 4 Earth Explorer missions in orbit, ice thickness and coverage, deforestation, soil moisture, sea level and ocean surface temperature, as well as other essential climate variables can be measured.  These satellites have global coverage, revisiting the same region every few days, therefore providing a good understanding of the health and behavior of our planet and how it is affected by climate change. In turn, this offers decision-makers key information for mitigating strategies and policies. |
| 10:02:20:14   * INT. Interview Michael Rast – 2018 – Euronews | **ITW Michael Rast, Head of Earth Observation Science Strategy - ESA**  Frequency and consistent observations of our environment are very important if we want to give decision-makers the key into their hands on where human-kind has to change practices, where we have to be mitigating for encroaching impacts on our environment " |
| 10:02:38:09   * Animation. Globe with mean sea-level rise. – 2017 – ESA * EXT. Coastline La Digne sur Mer, the Camargue, France – 2018- Euronews (7shots) * EXT. Aerial coastal village – unknown date – videoblocks * Ext. Grachten Amsterdam, The Netherlands – unknown date - Videoblocks * EXT. Aerial New York City – unknown date – Videoblocks * EXT. Night skyline Tokyo Harbor – unknown date – Videoblocks * Animation. Cryosat 360° fly around – unknown date – ESA * Animation. Greenland Icesheet elevation – unknown date – ESA * Animation. Globe with climate change initiative – 2018 – ESA * EXT. ESCAT building, Harwell, UK – unknown date - ESA * INT. scientist working, ESCAT building, Harwell, UK – unknown date - ESA * Animation. North poles Ice thickness – unknown date – ESA * Animation. Satellite date on soil moisture. – unknown date – ESA * EXT. Traffic near Arc de Triomphe, Paris, France – unknown date – Videoblocks * EXT. Aerial Industrial area- unknown date – videoblocks * Animation. Sentinel 5 fly-by in orbit – 2016 – ESA | Satellites can show us how the world has changed, like here in the Camargue, France, where the coastline has retreated by more than 200meters in the last 20 years. In the 1980’s seawalls were constructed here in a failed attempt to stop the rising water. Back then sea level was rising, but more slowly than it is now. Over the last five years records show that sea-level rise is accelerating. Soon, part of this delta will be lost to the sea. And what is happing here is happening in many parts of the globe.  Worldwide more than 370 million people live less than 5 meters above sea level. Over a hundred megacities such as New York or Tokyo are near the water, all are at risk. With satellite data give us the facts so that we can prepare ourselves for the rising tide and protect the coastline populations.  This data is also used in ESA's climate change initiative. Where ESA scientist preserve and work with long-term datasets going back to 30 years+ to even better understand climate change. Thanks to satellites we have evidence that the planet is in danger. Now it is up to the people on Earth to take the necessary measures in time. The key for sustaining life on Earth might come from Space. |
| 10:04:07:22 | **BR\_001 : A-Roll without logo and titles – audio split** |
| 10:08:15:19  Josef Aschbacher  Director of Earth Observation Programmes, ESA  English  Soundbites and inserts  Euronews | **BR\_002 : ITW Josef Aschbacher: Director of Earth Observation Programmes, ESA - English**   * Evolution of CO2 in the last 800.000 years * Higher values for 2018 * Danger of high values and international agreements * Variation in CO2 but never as high as toay (short) * CO2 levels over the last 2000 years * Inserts of hands and graphs with explanation (2shots) |
| 10:11:46:15  Michael Rast  Senior Advisor, Earth Observation Programmes, ESA  English  Soundbites  Euronews | **BR\_003 : ITW Michael Rast: Senior Advisor, Earth Observation Programmes, ESA - English**   * ESA has both Earth Observation and Copernicus satellites examples of SMOS and Sentinel 2 * Sentinels of Copernicus programme explanation of their functions * Importance of sister pair satellites, global satellites |
| 10:15:49:22  Douglas Muchoney  Remote Sensing Specialist, Food and Agriculture  Organisation of the United Nations  English  Soundbites  Euronews | **BR\_004 : ITW Douglas Muchoney: Remote Sensing Specialist, Food and Agriculture Organisation of the United Nations - English**   * Benefits and importance of remote sensing |
| 10:17:55:10  EXT. Anis Guelmami  Satellite Remote Sensing Scientist  La Tour Du Valat  Soundbites  French  Euronews | **BR\_005 : ITW Anis Guelmami: Satellite Remote Sensing Scientist, La Tour Du Valat – French**   * Added value of satellite data * Benefits of Sentinel 2 revisit times * How the sea advances every year * What do satellite data tell us about sea level rise |
| 10:21:16:19  EXT. Coast line La Digne sur Mer, the Camargue, France – 2018- Euronews | **BR\_006 : GV’s the Camargue**  **La Digue sur Mer – France - Euronews**  **France** |
| 10:24:55:02  Animation. Sentinel 5P – 2016 - ESA | **BR\_007 : Sentinel-5P**  **Global coverage and fly by**  **Animation**  **ESA** |
| 10:26:26:23  Animation. Globe and Graphs – unknown dates - ESA | **BR\_008 : Globes and Graphs on climate change**  **Animation**  **ESA**   * Different globes and graphs with climate change data * Globe with Sea level data * Globe with mean sea level rise * Globe with sea surface temperature data |
| 10:28:49:10 | **ESA space 19 outro** |
| 10:29:01:04 | **END** |