LANDSAT – 40th Anniversary – the first steps

Landsat - 40th Anniversary
The Early Days of Landsat Operations in the 1970ties

Lothar Beckel
European Academy of Sciences and Arts
Bill NORDBERG (right) in his homeland Styria, on top of his favorite mountain „Dachstein“ (3004 m), August 1976, with his friend Bill CAMPBELL, NASA/USGS.
How did it start?

Sputnik 1
The first man
Made Satellite –
launched by the Soviet
On October 4th, 1957

© Foto: L. Beckel
First US manned Spaceflights.

The Gemini Programm 1961 – 1966 brought exciting space photographs back to earth.

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View from Gemini Space Craft to Egypt with River Nile and via Red Sea to Saudi Arabia. The vision of Earth Observation from space was born.
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The Globe as seen from Meteosat Weather Satellite – with its impressive atmosphere and its water vapour in summer time.
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An Artist’s view on the early Earth Observation Research System,
Source: Telespacio, Italy

© Telespacio, 1970ties
Landsat Orbital Tracks, The „sun-synchronuos“ flight pattern of Landsat 1, one day coverage
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Landsat 3 and 4:
Flight path and image raw numbers for data order.

© Telespazio/NPOCAustria
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Landsat 1 – ESA Data collection and archive system: Microfiche with acquisition dates, Microfilm with images, Postcard-quicklooks of images, collection of 1-year data acquisitions over path 207, raw 27, 1972. CCT for delivery to customer.

© Foto: L. Beckel
Austria –
1st Landsat-Mosaic
1972 – 1973
A combination
of 17 Landsat images.

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Night Thermal (DLR Thermal Scanner) and day time multispectral airborne photograph of industrial site in Austria, for Landsat data interpretation 1973.

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Skylab, launched 1973, on its circular orbit in 435 km altitude. Three manned missions with a duration of 28, 59 and 84 days brought a great amount of metric camera photographs. Skylab photograph of Salzkammergut Lake district in Austria, September 1973.
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NASA Research Aircraft CV 990 during the Marginal Ice Zone Experiments 84 (MISEX), over Greenland Sea. Bill Campbell, USGS/NASA Scientist on the right. Tromsø, Norway, July 1994

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Fully microwave remote sensing equipped NASA research aircraft CV 990, in flight Over Greenland Sea between Greenland and Svalbard, July 1984

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Hectic activities on board of NASA CV 990

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North Polar Sea Ice Edge, as seen from NASA CV 990, July 1984.

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The French CNES / IGN joined with its research aircraft, a modified Boeing B-17 Flying Fortress, the MIZEX 84 Program. Equipped with a digital X-band side-looking radar (SLAR).
North Pole Sea Ice Concentration, several year average June-July, 1973-1976, calculated from sea ice brightness temperature, acquired by Nimbus 5 - ESMR microwave sensors.

© Foto: NASA, 1987
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Early satellite image processing system, 1973, at Institute for General and Applied Geology, University München, Germany.

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Landsat 5, near true color image of the Central Alps, Austria, with Grossglockner - Austrians highest mountain (3798 m). (band combination: 1, 2, 3), 1984.

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Landsat 5 - infrared false color image of the Central Alps, Austria, band combination: 4, 3, 2.

Landsat 5 - color coded thermal image of the Central Alps, superimposed to band 4 for terrain visualisation, 1984.
Shaded digital terrain model of the Central Alps, Grossglockner area. Processed from DTM data, provided by the Austrian Federal Mapping Institute, to be used for the calculation of 3-D oblique views.

Oblique view to the Central Alps of Austria with its highest mountain, the Grossglockner (3798 m). Calculated from Landsat 5 data, 1985, combined with digital terrain data from Austrian Federal Mapping Service.

SPOT IMAGE, France, launched 1986 the first French earth observation satellite SPOT 1. Two swiveleable sensors permitted the acquisition of stereo pairs for 3-D views.
Vienna seen from Landsat 1, 1973. Photographic color image produced from three 60 mm black- and white film negatives.

© L. Beckel /original data NASA.
Interrelations of nature and culture become obvious.
Landsat image and mosaic of the Elburs Mountains, Iran. (1973)

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The Globe – a piece of art:
Kilimandscharo,

© NASA/USGS
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The Globe – a piece of art: Ob River in the lowlands of West Siberia, 1985, in 2 versions.

© Geospace/ESA-Earthnet 1985
Atmospheric turbulences on the lee side of Jan Mayen Island (2341 m), North Atlantic; 1985. Foehn–Wall at the Central Ridge of the Alps, visible and thermal infrared image.

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NPOC Austria – Landsat Exhibition at Unispace II, 1982

© Foto: L. Beckel
Visitors at UNISPACE II admire Landsat images and space art.

© Foto: L. Beckel
Looking into the future: Satellite data acquisition, data processing, data distribution and GIS applications. 1970-ties.

© Foto of EOSAT-exhibition plate, L. Beckel.
What is a Geographic Information System? A Collection of maps, research results, information, measurements, ground truth data, photographs, etc., geocoded and digitally stored in separate layers in a data bank, to be merged with each other to understand interrelations of themes. (1972).

© Foto: L. Beckel
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Structure of a digital interactive GIS – Geocoded correlated elements can be merged and interpreted.

© Foto: L. Beckel
Our Globe – a World of Turbulences. Thanks to Landsat and all pioneers of successive Earth Observation Systems we understand our world better.
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The father of Landsat: Bill NORDBERG – born in Austria 1930, died in Greenbelt, Md. 1976

Thank you Bill for LANDSAT