ACRE, Citizen Science and OldWeather

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What is ACRE doing & aiming to produce?

• Undertaking & facilitating the recovery, imaging and digitisation of millions of historical instrumental surface terrestrial & marine global weather observations (ftp://ftp.ncdc.noaa.gov/pub/data/ispd/add-station/)

• to underpin reanalyses, particularly successive dynamical 4D global weather reanalyses assimilating only surface synoptic pressure, monthly SST & sea-ice observations over the last 200+ years being led by ACRE’s US partners

20th Century Reanalysis Project: 1891-2008 [Autumn 2009]

20th Century Reanalysis Project: 1871-2008 [Autumn 2010]


• for global climate research; climate applications, extremes, risks and impacts needs; educators & students, & the general public

• via a web-based interface that will store, allow access to, & enable visualisations of, the raw data, data images, meta data through to all of the variables generated by the 4D global weather reanalyses

Met Office-Technology Strategy Board-IBM Open Platform
With WMO, GEO, GCOS endorsement, wide international support & the aid of various working groups of GCOS & WCRP, ACRE provides an umbrella that links together some 35+ projects, data rescue, climate science, climate applications, education, & outreach activities around the globe.

Who else is involved internationally?
What data improvement is needed for historical reanalyses?

'PRIOR TO WORLD WAR 2, AS MUCH SURFACE DATA HASN'T BEEN DIGITISED AS HAS BEEN DIGITISED'
ACRE & ACRE-linked Data Recovery, Imaging & Digitisation Projects

• The English East India Company (EEIC) (1780s-1830s)

• CoRRaL: UK Colonial registers and Royal Naval Logbooks
  (http://www.corral.org.uk)

• An extended period during and following World War 1 (1914-1923)
  • UK hydrographic and survey vessel remarks books (1759-1909)
  • Expeditions, travels, circumnavigations and ships of exploration
    • China and South China Sea
    • ACRE Chile

• South Eastern Australian Recent Climate History (SEARCH
  http://climatehistory.com.au/)  
  • KNMI-BMKG 'DiDaH'
Regional Data Recovery, Imaging & Digitisation Foci under ACRE

**ACRE Chile** - initial funding from EC FP7 ERA-CLIM

**ACRE Pacific** - led via NIWA, NZ; initial French Pacific Fund project

**ACRE India** - linked to British Library-India initiative

**Eastern Mediterranean-Middle East-SE Asian** - funded by the University of Giessen, Germany

**ACRE Arctic** - being developed by the Atmosphere/Climate Working Group (WG) of the International Arctic Science Committee (IASC)

**ACRE Africa** - event at UNFCCC CoP17, Durban, South Africa

**ACRE China** - start via a project with Bristol University
Reanalyses Assimilating Historical Weather Observations

What has ACRE produced for climate science?

Historical 4D global weather reanalyses: 1908-1958; 1891-2008; 1871-2008

Northern Hemisphere: 1931

Storm Track
Skewness of Northern Hemisphere 250 hPa daily
Vorticity (Dec-Feb) 1989/90-2005/06

Tropics: 1919

Google Earth: 200 hPa wind vectors
Jan 1908-58

MSLP

500 hPa GPH

Contours- ensemble mean
Shading- blue: more uncertain, white: more certain

ERA Interim (~50km)
Uses satellite data

20CRv2 (~200km)
Surface pressure only

NCEP-NCAR (~200km)
Uses satellite data
October 16\textsuperscript{th}, 1987
October 16th, 1987
March 8th 1918
March 8th 1918
Archives

The National Archives: Kew, London

The British Library: London

Museo Naval y Maritimo: Valparaiso, Chile

The Asiatic Society, Kolkata, India
A treasure from the archives
24/25th September 1914
24th September 1914: 8 a.m.

[Handwritten text]

C.S.O. | be. | 30.09 | 68 | 57 | 56 | 4.0

Cleaning ship deck
Log of HMS Invincible, 8th December 1914
Welcome to Galaxy Zoo, where you can help astronomers explore the Universe

New, more detailed images added - see here for details

The Galaxy Zoo files contain almost a quarter of a million galaxies which have been imaged with a camera attached to a robotic telescope (the Sloan Digital Sky Survey, no less). In order to understand how these galaxies — and our own — formed, we need your help to classify them according to their shapes — a task at which your brain is better than even the fastest computer.

More than 150,000 people have taken part in Galaxy Zoo so far, producing a wealth of valuable data and sending telescopes on Earth and in space chasing after their discoveries. Zoo 2 focuses on the nearest, brightest and most beautiful galaxies, so to begin exploring the Universe, click the 'How To Take Part' link above, or read 'The Story So Far' to find out what Galaxy Zoo has achieved to date.

Thanks for your help, and happy classifying.

The Galaxy Zoo team.
Moon Zoo
Explore the Moon in unprecedented detail using images from NASA's Lunar Reconnaissance Orbiter.

JOIN IN

Galaxy Zoo: Hubble
The latest version of the original Zooniverse project. Help astronomers figure out how galaxies form and evolve by classifying their shape. Now with added Hubble galaxies.

JOIN IN

Solar Stormwatch
Help spot explosions on the Sun and track them across space to Earth. Your work will give astronauts an early warning if dangerous solar radiation is headed their way. And you could make a new scientific discovery.

JOIN IN

Live Projects

Galaxy Zoo: Mergers

Zooniverse Activity
Total Volunteers: 315,059
http://oldweather.org

Old Weather: our weather’s past, the climate’s future

What we need
Help scientists and historians find and record weather observations and ship movements made all over the world by Royal Navy ships around the time of the Battle of Jutland.
HMS Invincible
Portsmouth → Scapa Flow

HMS Invincible was a battlecruiser of the British Royal Navy, the lead ship of her class of three, an... Learn more

Map and timeline
the 6th day of August, or At Portsmouth.
Enter a weather reading

<table>
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Number on Chart: 124
HMS New Zealand in 1919 (circumnavigation)
Oldweather Phase 1:
October 2010-May 2011 = 456,639 logbook pages
About 60% of ships done
See also:
• Blog - http://blogs.zooniverse.org/oldweather/
• Forum - http://forum.oldweather.org/
• Follow oldweather on twitter.
Due to open in time for the London 2012 Olympics, the Sammy Ofer Wing
‘Asian Seas’

A Permanent Gallery
at the
National Maritime Museum
Opening late summer 2011
Now online!

Data rescue at home is an internet-based attempt to digitize historical weather data from all over the globe and make the digitised data available to everybody. Two projects are currently online: German radiosonde data form the Second World War and meteorological station data from Tulagi (Solomon Islands) for the first half of the 20th century.

Join the community effort to digitize precious historical climate data.

Digitize an image

For more options and personalized settings please

Register

http://www.data-rescue-at-home.org
International ACRE Project Manager

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U.K.
The 4th Atmospheric Circulation Reconstructions over the Earth (ACRE) Workshop
in conjunction with EC FP7 EURO4M and ERA-CLIM plus AHRC Historic Weather
KNMI, De Bilt, The Netherlands,
21st-23rd September 2011