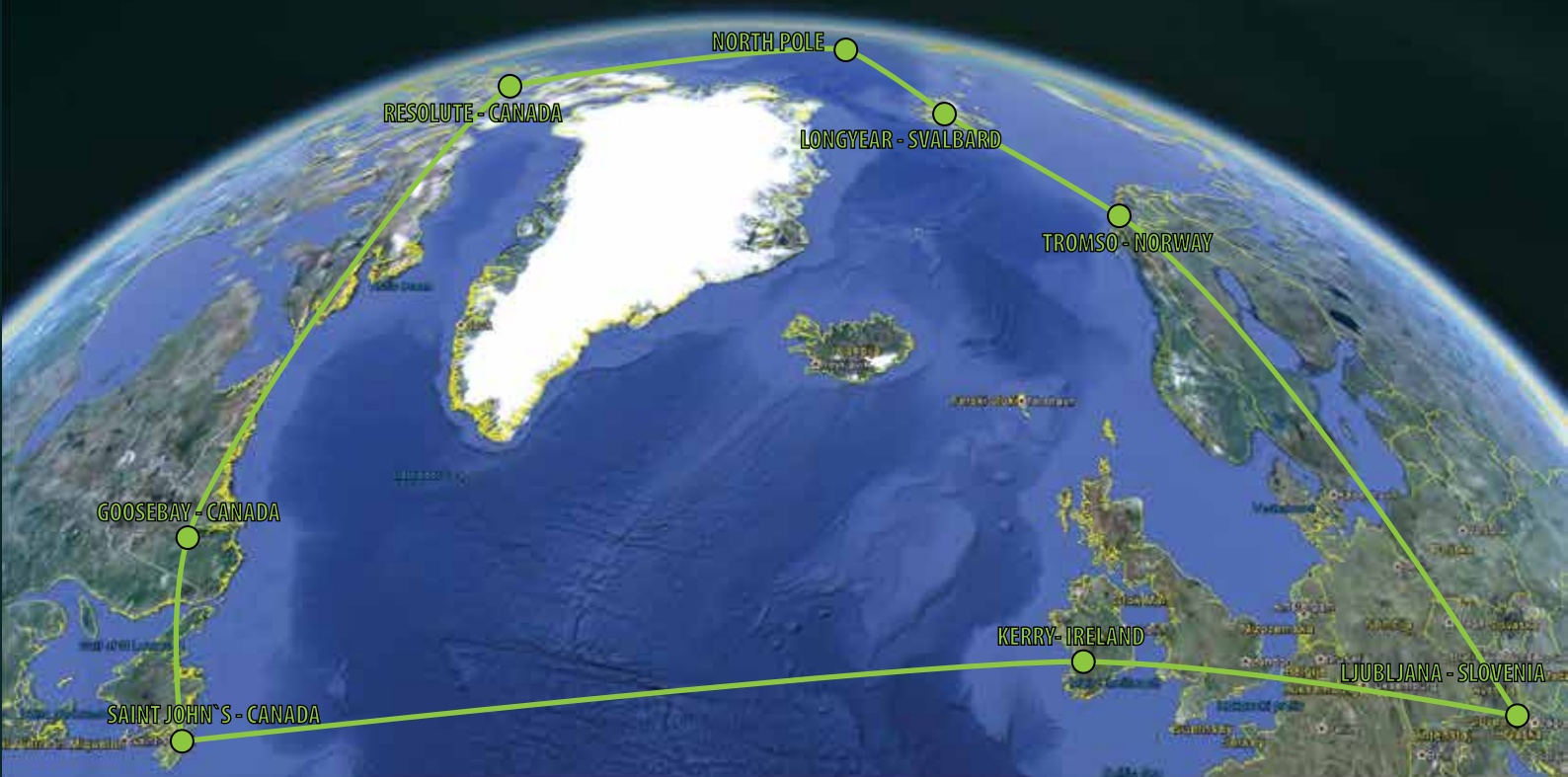


North Pole 2013

think small - think light - think green

adventure for science

ARCTIC ICE IS DISAPPEARING
DUE TO BLACK CARBON?



www.worldgreenflight.com



PETROL



Aerodrom Ljubljana



SLOVENIA
CONTROL



NORTH POLE / April - May 2013

and the entire Arctic region have a rich history of discovery and exploration. Legendary expeditions in the name of national interests have led to discovery of new trade routes, which brought strategic and capital benefits. The Arctic is also very important generator of weather. Changes in the ice shell can have a decisive impact on the speed and direction of ocean currents and thus the lives of the entire world.

Today in the early 21st century Arctic expeditions are still frequent, the north polar region has been crossed on foot, on skies, with ice-breakers, submarines and aircrafts. But Light and Ultralight planes are still extremely rare in this part of the world. Despite the development of high performance ultralights no one has overflown the North Pole from one continent to another.

Furthermore, the research technical instrumentation has been changed as well. Detection devices which weighed hundreds of pounds just a few years ago, nowadays you can fit the same into a fuel efficient, low cost and nature friendly ultralight aircraft.

This is also the mission of the GreenLight WorldFlight project which continues in the spring 2013 over the Arctic and North Pole from Europe to Canada and complete the long distance flights by passing the North Atlantic from Newfoundland to Ireland following the Lindberg's record flight New York-Paris. Small ultralight aircraft in the service of science.



THINK SMALL - THINK LIGHT - THINK GREEN

Aerosol scientists such as Ryan Spackman of the National Oceanic and Atmospheric Administration in Boulder, Colorado, already use much more sensitive instruments mounted on Gulf Stream jets to collect black carbon data—but such flights are expensive for scientists. Small private aircraft could help fill in a lot of data gaps, particularly at low altitudes near urban areas where soot concentrations tend to be high enough for an Aethalometer to provide very good data, Spackman says. "The first few kilometers [above ground level] are the most interesting."

BLACK CARBON MEASUREMENTS DURING THE 2013 FLIGHT TO THE NORTH POLE

dr. Griša Močnik, Aerosol d.o.o.



Combustion of carbonaceous fuels for the production of energy results in the emission of particulate air pollutants, including considerable amounts of light absorbing carbonaceous aerosols. These exhibit very large optical absorption across the short-wave optical spectrum. Aerosolized black carbon (BC) is a unique primary tracer for combustion emissions; it is inert and can be transported over large distances (Bodhaine 1995, Weigum 2012), even though its lifetime in the atmosphere is relatively short and measured in days or weeks. BC affects the optical properties of the atmosphere when suspended, leading to local heating or cooling, depending on the processes involved (Menon 2002). It is recognized as the second most important cause of global warming with a contribution between 20% and 40% with a significant regional heterogeneity (Ramanathan 2008). The Arctic is especially vulnerable to the effects of BC. The warming continues after deposition of BC on the snow and ice due to the darkening of the otherwise reflective surface.

The Arctic has seen unprecedented melting this year and also in the past years (NSIDC 2012), potentially opening new shipping routes. Ship engines emit large amounts of BC and the deposition of BC has a positive feedback – as more ice melts, more ships will use the new lanes. Measurements of BC in the Arctic have been performed for a long time (Hansen 1989), but with very limited spatial coverage, and measurements of vertical profiles have been performed only recently (Ferrero 2012).

We have demonstrated during the GLWF2012 round-the-world campaign that a lightweight aircraft can provide valuable information on BC concentrations, their regional heterogeneity and vertical profiles with a minor payload and for a fraction of the cost associated with large airborne platforms (Močnik 2012). In late spring 2013 during the flight to the North Pole the same measurements will be carried out. We have modified the aircraft to include an aerosol inlet and a prototype Aethalometer will be used to measure BC. Additional auxiliary measurements will be carried out onboard. We will attempt to measure the effect of the shipping on the BC concentrations in the Arctic during the flight, and analyze the spectral dependence of aerosol absorption to determine the sources (Sandradewi 2008). During flight plumes of pollution might be encountered and using back trajectories possible source regions will be identified.

PILOT

Matevž Lenarčič (1959, Slovenia) has graduated in biology. An alpinist, paraglider, environmentalists, photographer and a pilot, he has climbed all over the world and among others reached the top of 8051m Broad Peak in Himalaya and climbed extreme routes in Patagonia. He is author of 11 books (nature, photography, climbing and flying), some of them awarded and translated in several languages. He is also founder and director of Aerovizija d.o.o., company for aerial photography.

www.aerovizija.com

Matevž Lenarčič is experienced long distance flier.

Besides "normal" flying in Europe, mostly for aerial business purposes (vertical and oblique photography), he has also some extreme flights under his belt:

Worldtranssiberia 2002:	28 000km over 8 countries incl. Russia
Around The Only World 2004:	38 000km crossing 23 countries
Africa - Valley of Life 2005:	17 000km over 13 countries
The Alps - A Bird's Eye View 2006 - 2009:	60 000km all over the Alps
GLWF:	91 000km

He has flown for more than 3000 hours all over the world, mostly with his ultra light motor glider and other single engine aircrafts. He holds PPL - private pilot license with IFR - (instrumental flight rules) rating, night qualification, and ULPL - ultralight pilot license.

Records:

- | Official national speed record Around the World Eastbound - C1a
- | Anofficial world speed record Around the World Eastbound - C1a
- | 2nd place national competition RAL2 2005

Aviation awards and prices

- Fédération Aéronautique Internationale (FAI):

- | Bronze colibry
- | Silver colibry
- | Diamond colibry
- | Circumnavigator East Diamond

Active member (Supervisory Board) AOPA Slovenija (Aircraft Owner and Pilot Association) | Member AOPA America
Member EAA America (Experimental Aircraft Association) | Member aeroclub AK Prlek and Društvo Zgornjesavinjskih letalcev

More informations: www.wingsforever.com | www.panalp.net | www.aerovizija.com | www.worldgreenflight.com



SUCCESSFULLY ACCOMPLISHED PROJECTS

WORLDTRANSSIBERIA 2002

28 000 km crossing 8 countries
www.worldtranssiberia.com

GLWF 2012

91 000 km
www.worldgreenflight.com

AROUND THE ONLY WORLD 2004

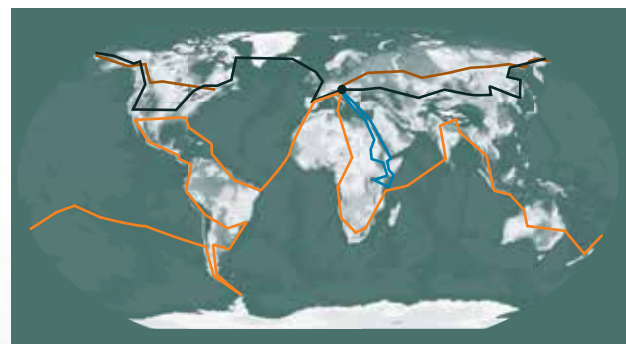
38 000 km crossing 23 countries
<http://www.rtv slo.si/protisoncu/>

AFRICA - THE VALLEY OF LIFE 2005

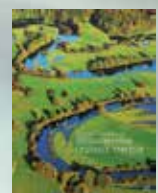
17 000 km crossing 13 countries
www.wingsforever.com/afr.php

THE ALPS - A BIRD'S EYE VIEW 2006 - 2009

60 000 km
www.panalp.net



MATEVZ "AERIAL VIEW" BOOKS



AIRCRAFT

PIPISTREL VIRUS-SW

(standard configuration)



MOTOR ROTAX	ROTAX 912 ULS
SIZES	
wing span	10,71 m
length	6,5 m
height	1,85

WEIGHTS

empty weight	290 kg
max take off weight (MTOW)	450/ 600 kg
fuel tanks capacity	2 x 50 l

PERFORMANCES

stall with flaps	64 km/h
cruising speed (75% power)	273 km/h
VNE	302 km/h
turbulence penetration speed Vb	250 km/h
service ceiling (450 kg)	6800 m
fuel consum. at cruis. speed	17,8 l/hour

GreenLight WorldFlight TEAM:

Matevž Lenarčič



Domen Grauf



Vojko Strahovnik



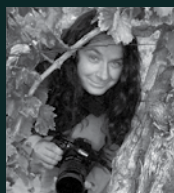
Ivo Boscarol



Pipistrel Virus-SW914



dr. Petra Draškovič



dr. Griša Močnik



Andreja Vrečar



Tine Tomažič



More informations about team members of GreenLight WorldFlight you can find on www.worldgreenflight.com

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SPONSORS

GreenLight WorldFlight would not have been possible without the support of our friends, sponsors and many people who are helping us during preparation. I would like to thank all these people and companies for their positive attitude and for believing in this great nature-friendly aviation and human adventure.



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YOU CARE ABOUT OUR COMMON GREEN FUTURE.**