





Planet zemlja se segreva

Znanstveniki agencije NASA predvidevajo, da se lahko v naslednjih letih gladina morske vode dvigne za 1 meter

Črni ogljik, ki nastaja zaradi posledic onesnaževanja človeka povzroča segrevanje 1,1 W/m²

7 milijonov ljudi vsako leto umre zaradi onesnaženega zraka

Ukrepamo lahko takrat, ko dobro poznamo problem onesanženja

Pravna ureditev izpustov črnega ogljika se mora spremeniti

ČRNI OGLJIK

Črni ogljik so saje, ki nastanejo pri nepopolnem izgorevanju ogljičnih materialov kot so bencin, dizel, les, biomasa...

Črni ogljik segreva atmosfero in je drugi najpomembnejši povzročitelj pregrevanja planeta s prispevkom okrog 15-30%.

Črni ogljik je inertna snov, ki potuje z zračnimi masami na velike razdalje, zato povzroča lokalne, regionalne in globalne probleme.

Drobni delci črnega ogljika se z dihanjem akumulirajo v plučih in povzročajo astmo, raka in srčno žilne bolezni.


V Evropi je zaradi onesnaženega zraka življenje v povprečju skrajšano za 8 mesecev, v Ljubljani za več kot 12

Meritve črnega ogljika v Evropi še vedno niso zakonsko predpisane.

ZDA imajo nacionalni program merjenja črnega ogljika.

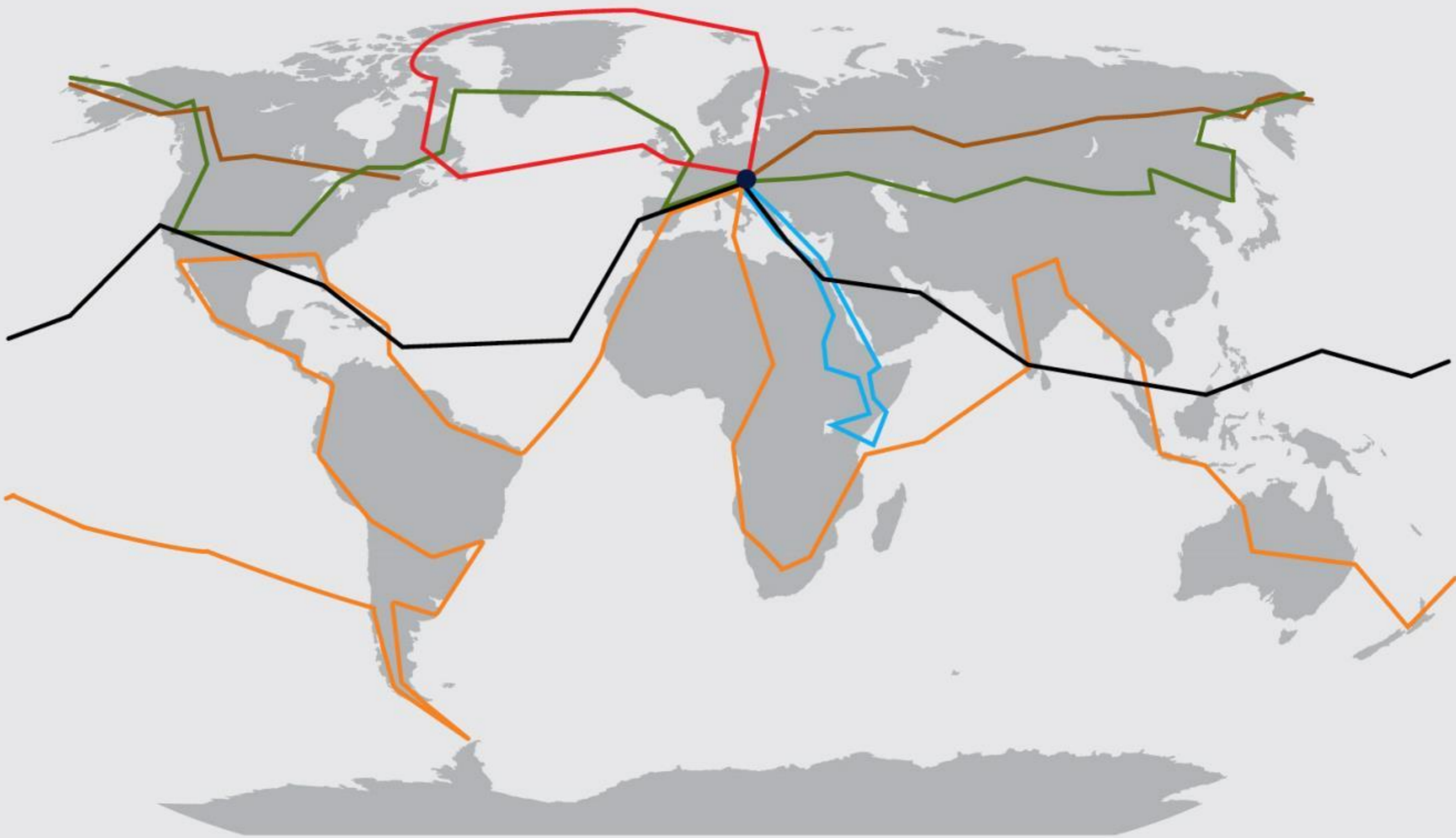
Večina meritev je izvedena na tleh.

GLWF je prvi globalni raziskovalni projekt meritev črnega ogljika iz zraka.



ČRNI OGLJIK
raziskava onesnaženosti

GreenLight WorldFlight
2012 - 2022



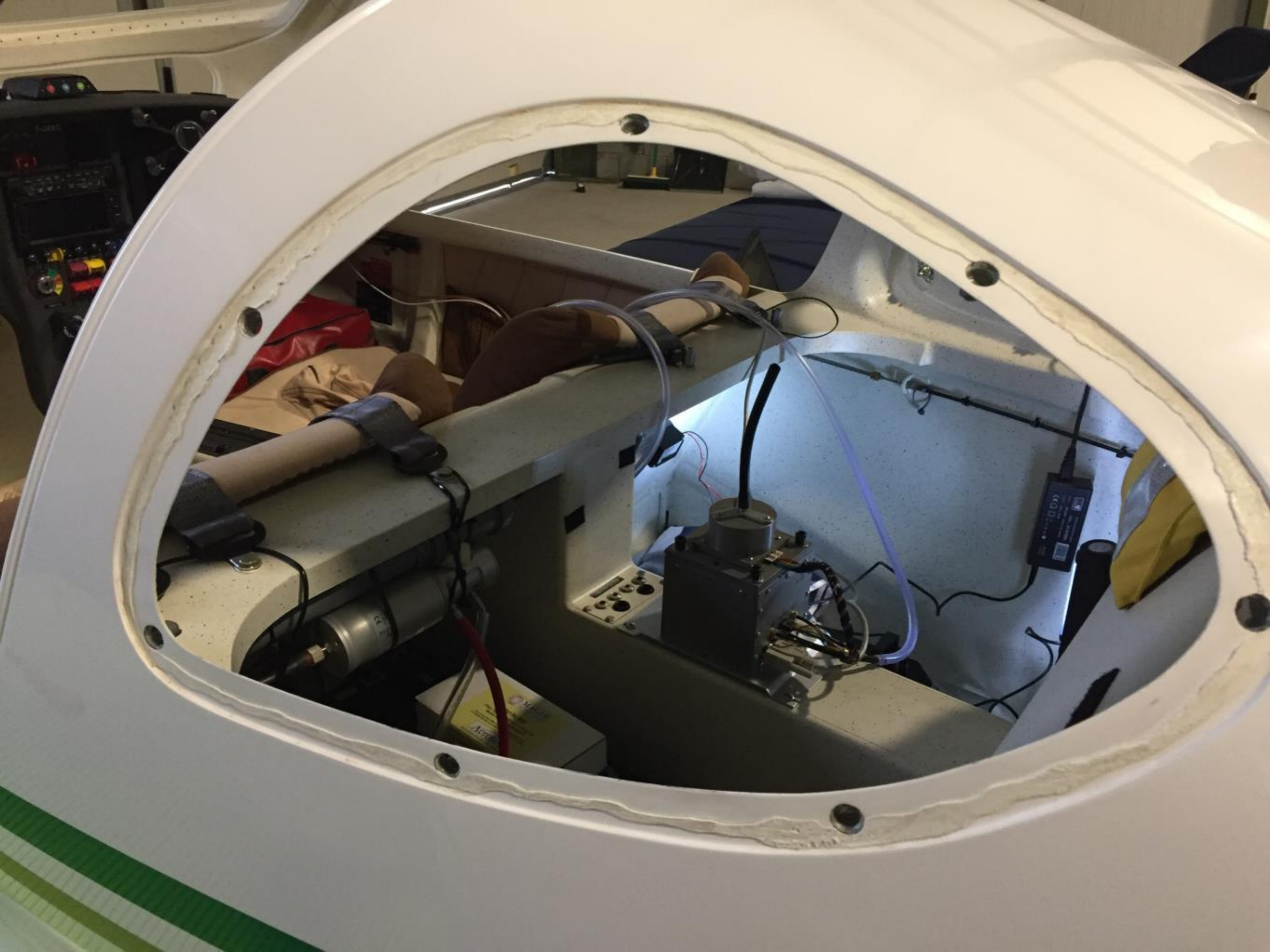
Ultralahko letalo Aerospool Dynamic WT9 Survey

Teža praznega letala:	309 kg
Hitrost:	245 km/h
Dolet:	+ 5000 km
Avtonomija	22 ur
Poraba:	13 - 16 lit / h
Gorivo:	95 zeleno



Aethalometer





Air intake system



Gorivo in W&B



GreenLight WorldFlight 2012 - 2013

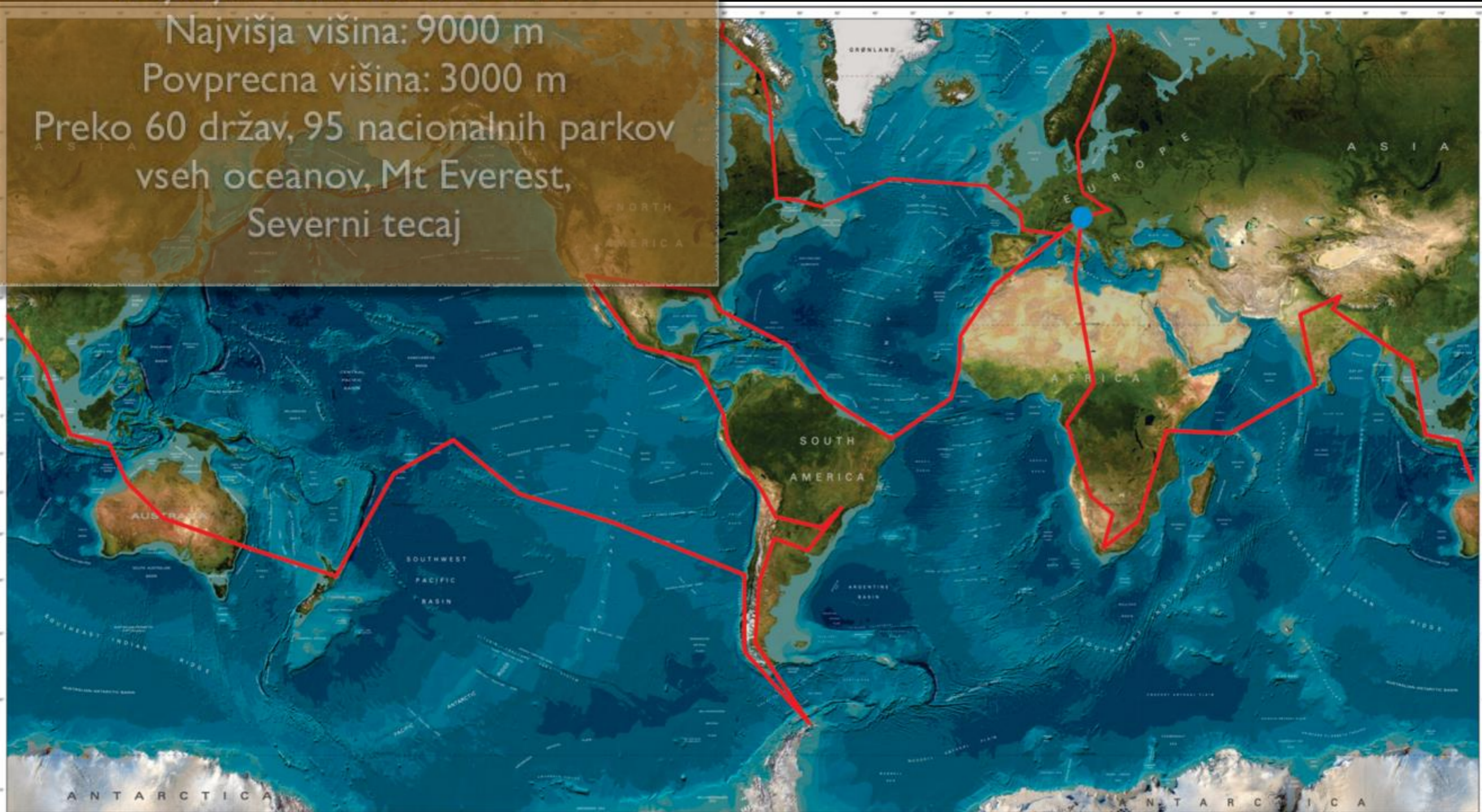
Razdalja: 108 000 km

Trajanje: 4 month in 2012-13

Najvišja višina: 9000 m

Povprečna višina: 3000 m

Preko 60 držav, 95 nacionalnih parkov
vseh oceanov, Mt Everest,
Severni tecaj





































MILCAN / PCSP 3012
Euros NU

-43646

CARBURÉACTEUR A-1 MA
JET A-1 AIA

JEPPesen



GreenLight WorldFlight 2016

Razdalja: 42 000 km

Trajanje: 28 dni

Povprečna višina: 3000 m

Preko 34 držav

34 000 km preko oceanov



GreenLight WorldFlight 2016

1/ Ljubljana - Lisbon: 2165 km / 10 h
2/ Lisbon - Praia: 2980 km / 13 h
3/ Praia - Fort de France Bay: 4022 km / 17 h
4/ Fort de France Bay - Orlando: 2593 km / 12 h

5/ Orlando - Salinas: 3851 km / 18 h
6/ Salinas - Maui: 3784 km / 17 h
7/ Maui - Majuro: 3791 km / 17 h
8/ Majuro - Guam: 2976 km / 13 h

9/ Guam - Sandakan: 3043 km / 14 h
10/ Sandakan - Phuket: 2188 km / 10 h
11/ Phuket - Mumbai: 2998 km / 13 h
12/ Mumbai - Tehran: 2800 km / 13 h
13/ Tehran - Ljubljana: 3269 km / 15 h



THE FUTURE
IS ULTRA-LIGHT
AKRAPOVIC

THE FUTURE
IS ULTRA-LIGHT





Handwritten text on a red tag attached to the bag, including "521-4000" and "10/15/15".

PILOT SHOP

FRONT





F-JAKG

GARMIN

3714 ALT
MAN IN 21.5
RPM 5000
LPH 14.8
OIL BAR 9.3
OIL °C 91
EGT °C 787
FUEL QTY
Timer 01:05:30
WPT SEKUN 278
DIST 108
ETE 47:52
GS 135
TKX 278
MSL 1000
VTA 20:15
8500
1013

128.000
127.800
Clear Strides

Garmin engine parameter display with various gauges and indicators.

LAND STROKE
ENGINE
REVERSE
PROP
LAND
ENGAGE
MAN F
PROP
REVERSE

OPEN
FUEL RES
FUEL PUMP
Fuel pump control panel with a fuel reserve gauge and a fuel pump button.









HANSEN

I FEEL SLOVENIA

Aerosol mi-propeller



Slovenske letalske družbe



THE FUTURE
IS ULTRA-LIGHT

AKRAPOVIC

ULTRA-LIGHT

ULTRA-LIGHT

THE FUTURE
IS ULTRA-LIGHT
ULTRA-LIGHT











CENTRO



THE FUTURE
IS ULTRA-LIGHT

AKRAPOVIC

AKRABOVIC

AKRABOVIC

THE FUTURE
IS ULTRA-LIGHT



THE FUTURE IS ULTRA-LIGHT

GARMIN

Aerosol mt-propeller

LOVE

F-JAKG

THE FUTURE IS ULTRA-LIGHT



THE FUTURE
IS ULTRA-LIGHT

AKRAPONIC

BY THE UNIVERSITY
OF COLLEGE

THE FUTURE
IS ULTRA-LIGHT



THE FUTURE

THE FUTURE
Sustainable
Sustainable



සාන්ත අන්තෝනි කදවුරුවාගේ
(කැ.ලැ. ෨෧෪) විහාරස්ථලය, සීදුව
SHRINE OF ST. ANTHONY
LIYANAGEMULLA, SEEDUWA
ශ්‍රී 290 M

RDA

Sunil Snacks
විකුණාපොල
සමාජ සේවා
සමාජ සේවා

SOLAR GEMS
GEMS
GEM CUTTING

ALT 10000 FT

10000 FT

10200

10100

10000

9900

9800

1013 MB

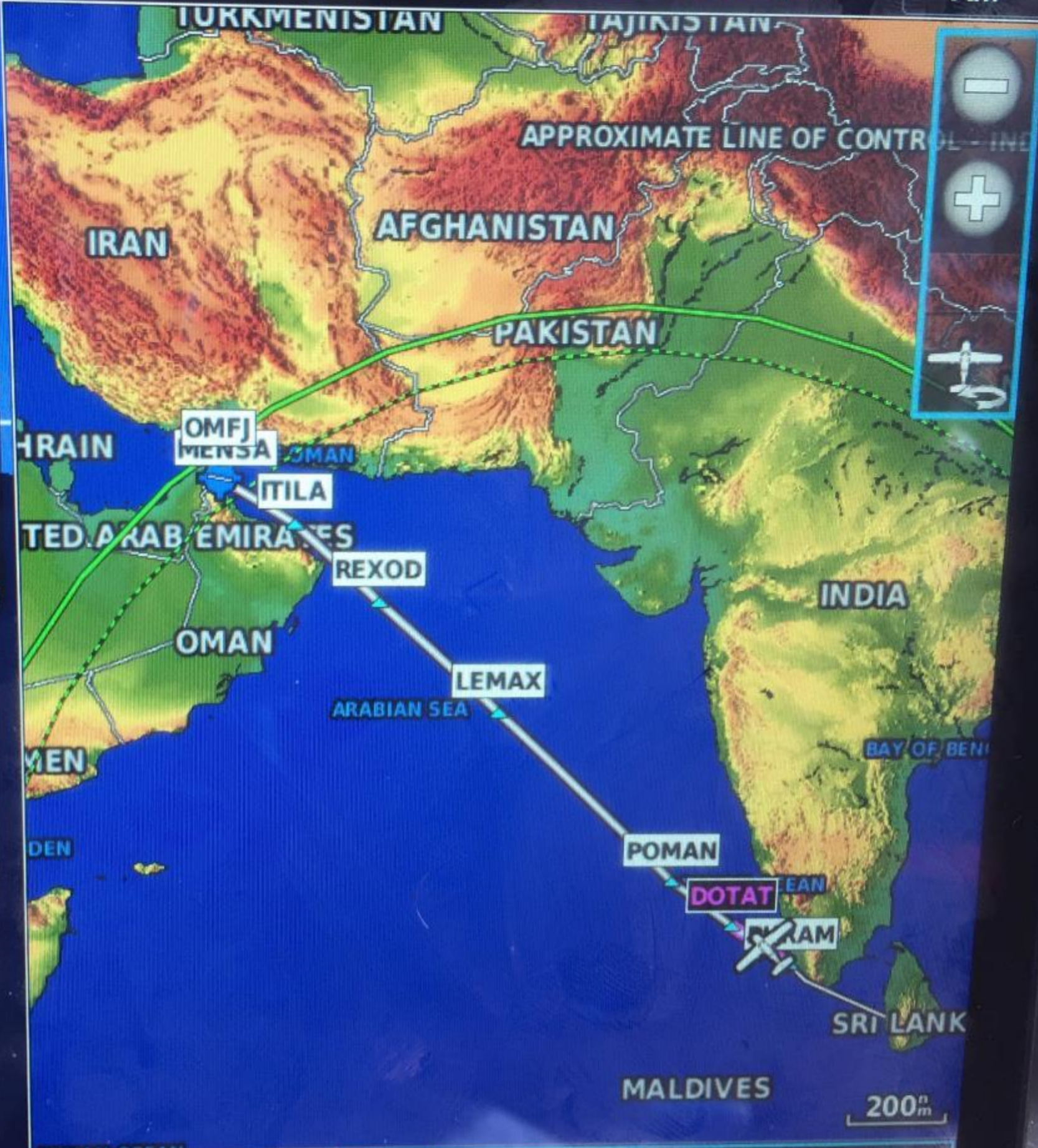


305°

CRS 305°



NO DATA LOC



Map navigation controls: zoom in (+), zoom out (-), and a plane icon.

Map

Map Cht Wpt FPL Wx Ter Trf Info

Zoom Map Select Page



THE FUTURE
IS ULTRA-LIGHT

AKRAPVIC

ULTRA-LIGHT

THE FUTURE
IS ULTRA-LIGHT

THE FUTURE IS ULTRA-LIGHT

THE FUTURE





THE FUTURE
IS ULTRA-LIGHT



THE FUTURE
IS ULTRA-LIGHT
SUPRA-LIGHT





Acrosol THE FUTURE OF ULTRA-LIGHT

I FEEL LOVE

Acrosol

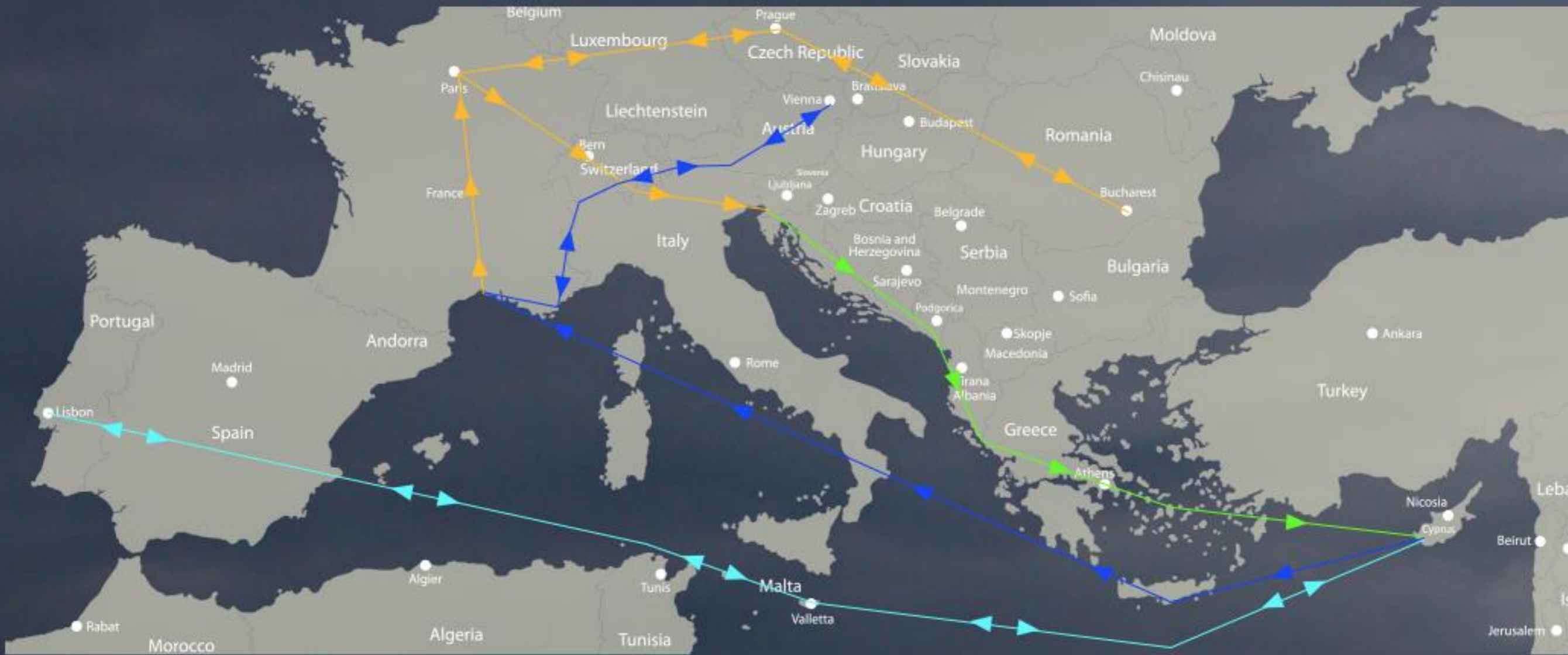
F-JAKG

Dynamic Survey

Photo: Claudio Del Giusto, OLCP

GreenLight WorldFlight 2017

Black carbon and Sahara dust reserach



1. **Portorož – Pafos/Cyprus** ■ 10,000 ft ■ 2.400 km
2. **Pafos/Cyprus – Lisbon – Pafos/Cyprus** ■ 6.000 ft, 11.000ft ■ 7.600 km
3. **Pafos/Cyprus – Marseille – Vienna – Marseille** ■ 8.000 ft, 12.000 ft ■ 4.800 km
4. **Marseille – Paris – Bucharest – Paris – Portorož** ■ 6.000 ft, 11.000 ft ■ 5.500 km

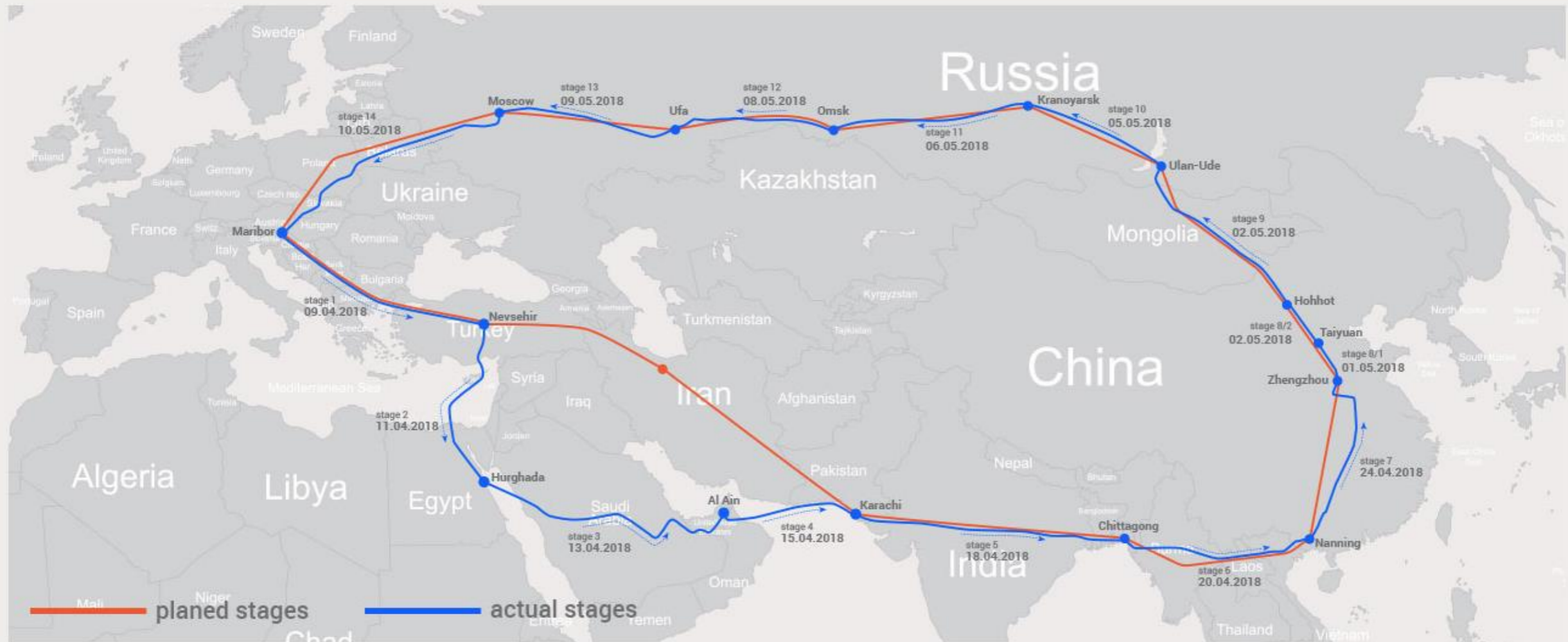






Black carbon pollution research - ASIA 2018

The GLWF 2018 mission will look for evidence for two big environmental issues which significantly contribute to the accelerated pace of global warming: **enormous forest fires and transport of desert dust of Asia.**



Maribor • **SLOVENIA** » Cappadocia Nevsehir • **TURKEY** » Tehran • **IRAN** » Karachi • **PAKISTAN** »
 » Chittagong • **BANGLADESH** » Nanning • **CHINA** » Zhengzhou • **CHINA** » Hohhot • **CHINA** » Ulan Ude • **RUSSIA** »
 » Krasnoyarsk • **RUSSIA** » Omsk • **RUSSIA** » Ufa • **RUSSIA** » Moscow • **RUSSIA** » Maribor • **SLOVENIA**







 Lumar

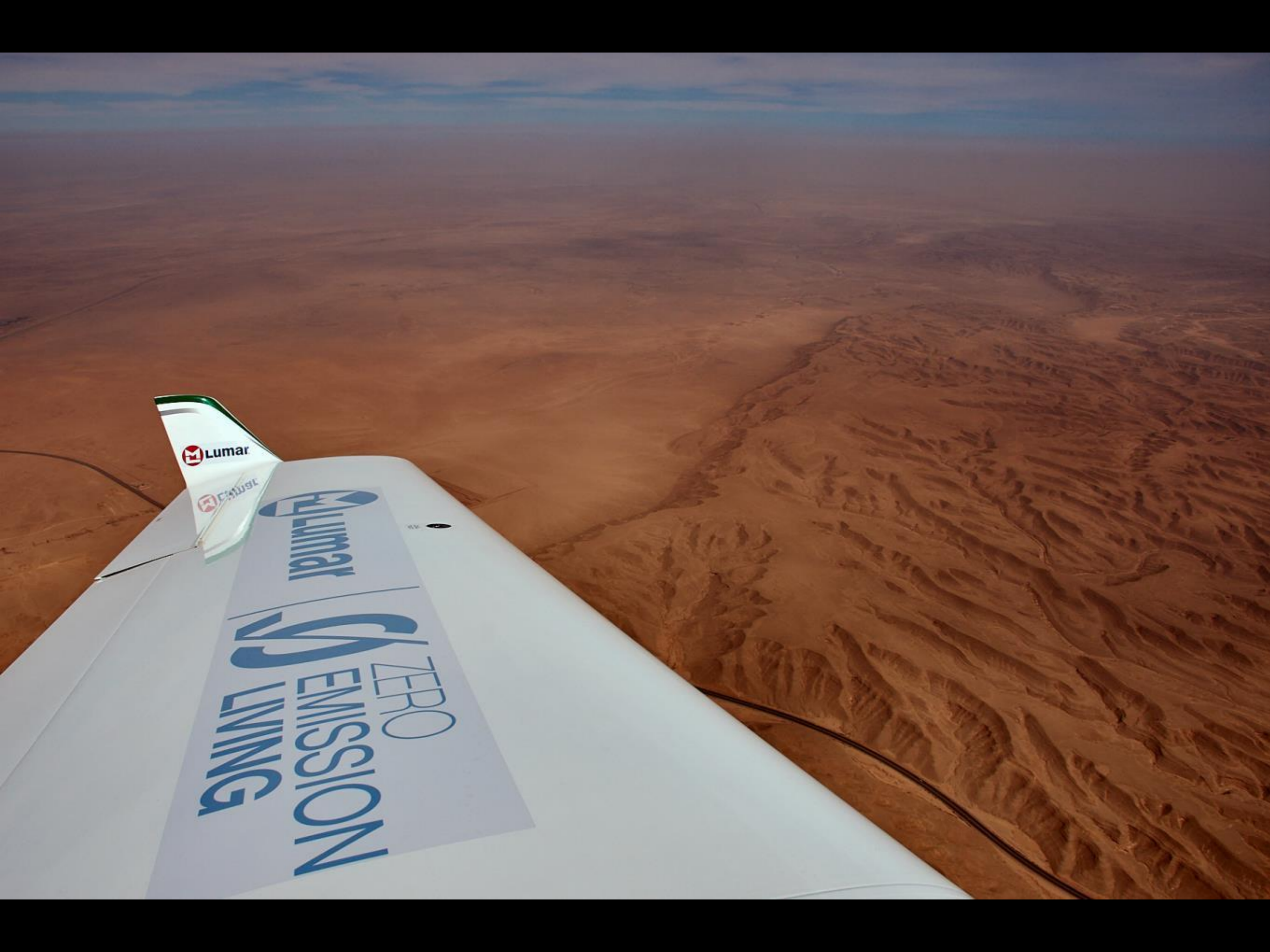
 Lumar

Lumar

ZERO
EMISSIONS
LUMAR







Lumar

Must

Lumar

ZERO
EMISSION
LIVING





 Lumar

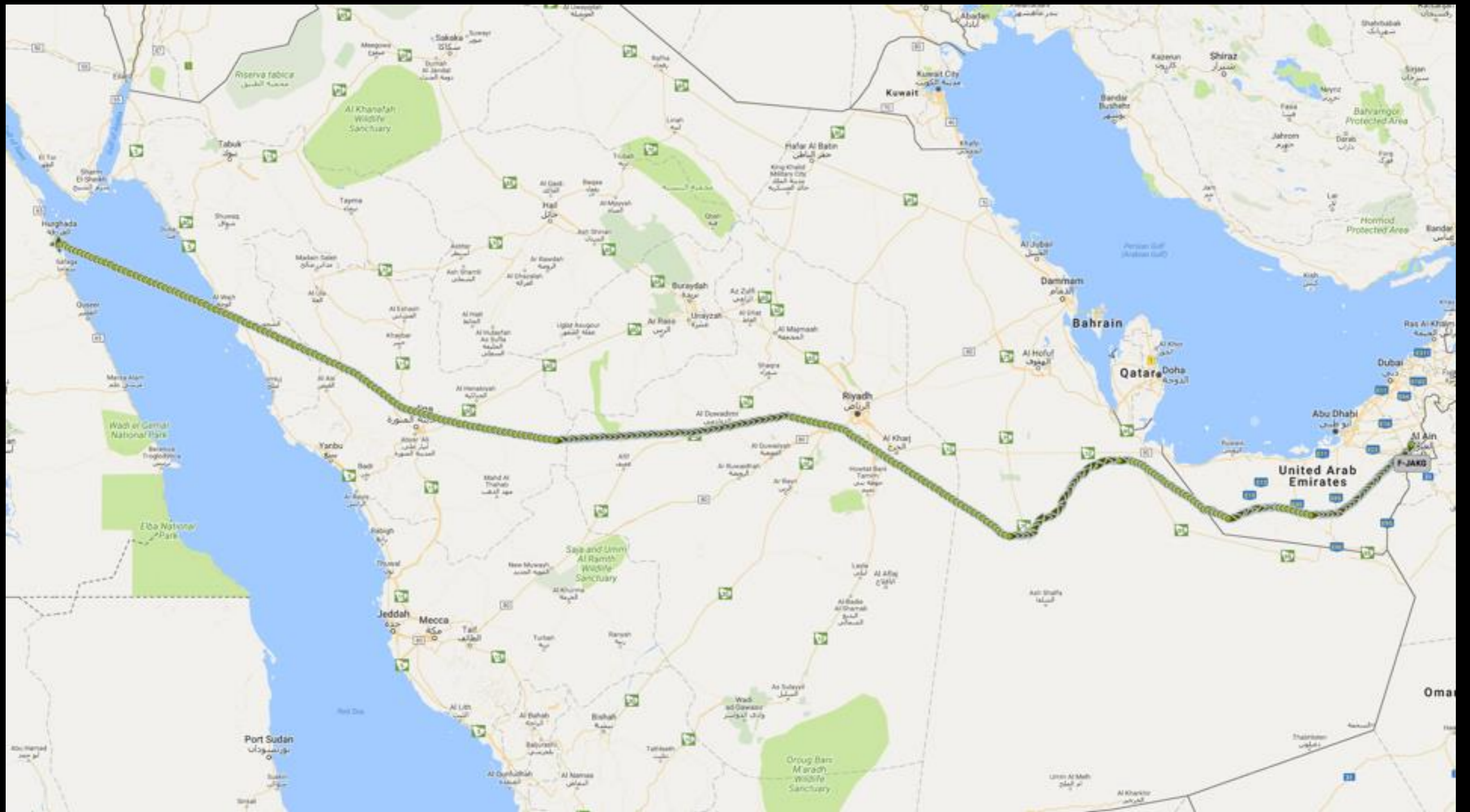
 Лумар



Dynamic Survey

F-JAKG

MELES IJS Aéroiel





Lumar

EMERSON

Lumina

ZERO
EMISSION
LIVING



1-2

Com Vol
Psh Sq

Stormscope®

HDG UP

COM
132.900

STBY
134.500

MON

ETE
56:38



In



Out

Mode: Strike
Rate: 28

Com Freq / Psh Nav



Menu



MSG



Back

Clear
Strikes

ENR

GPS

AP

AUX F.PUMP

LAND

STROBE

AVIONICS

HYDR. PUMP

EMERGENCY | MAIN F.PUMP

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EMISSION
LIVING



Aerosol

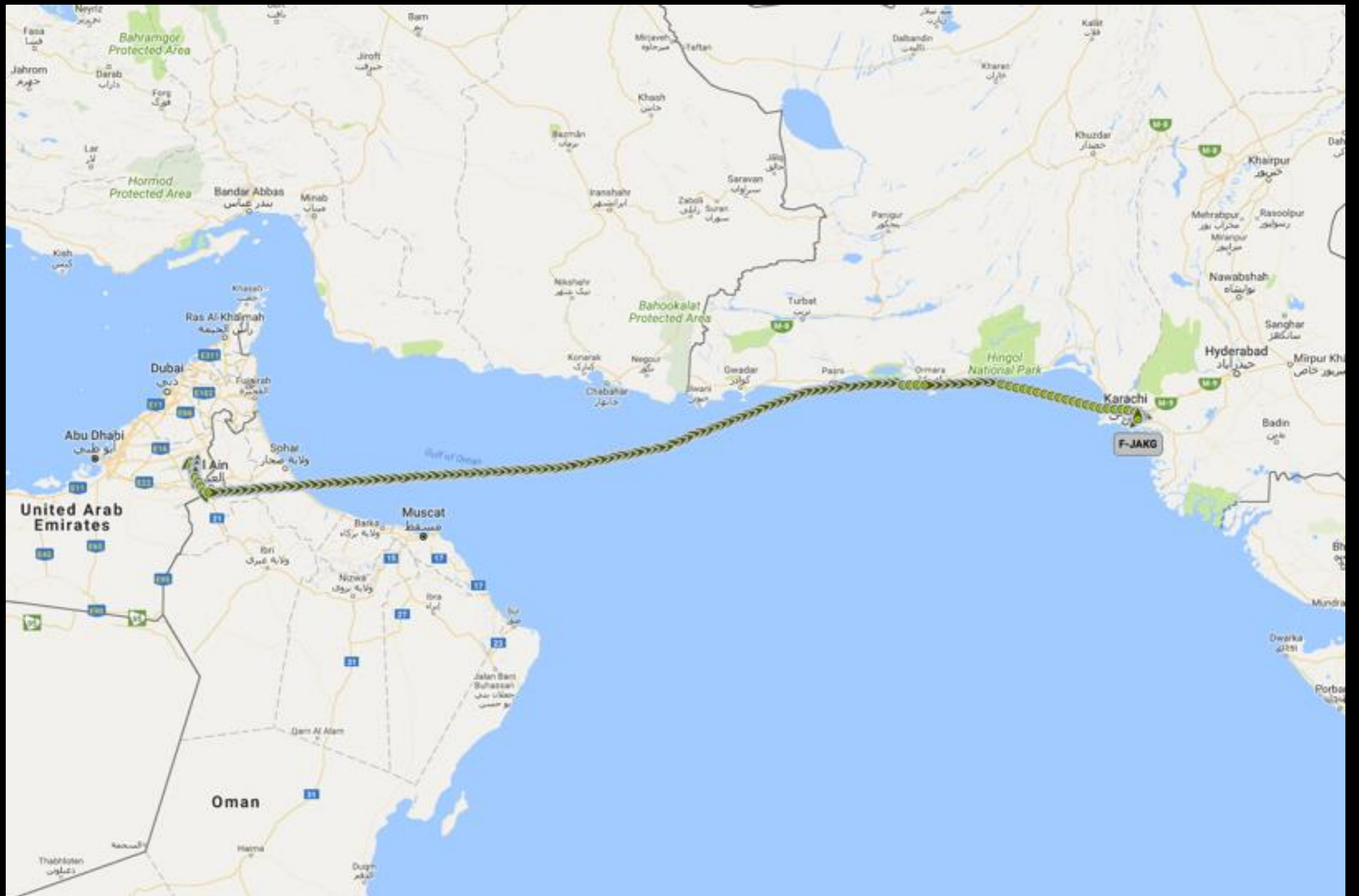
BLACK CARBON POLLUTION RESEARCH ASIA 2018

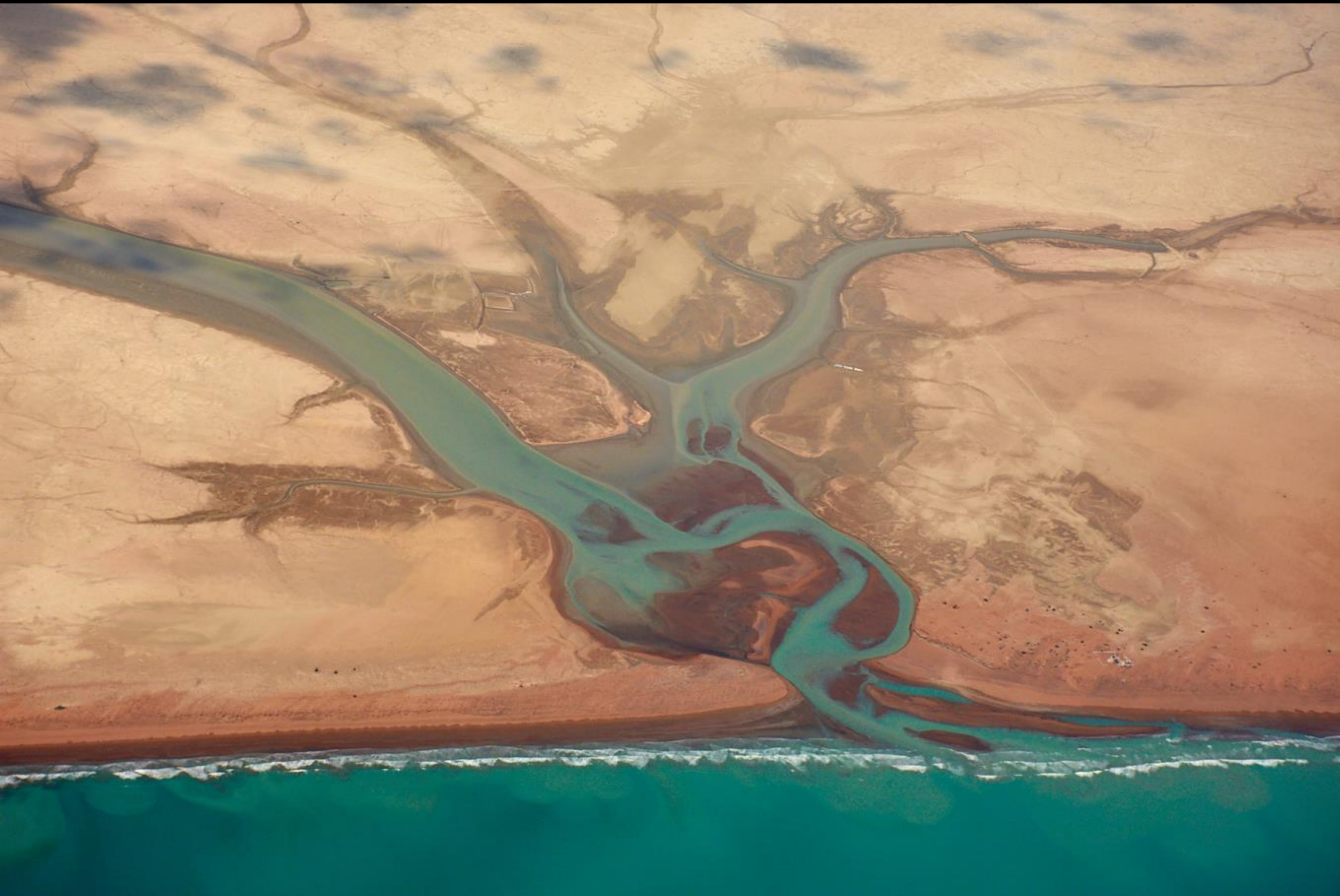


energetika ljubljana

WTS Dynamic

LUMAR







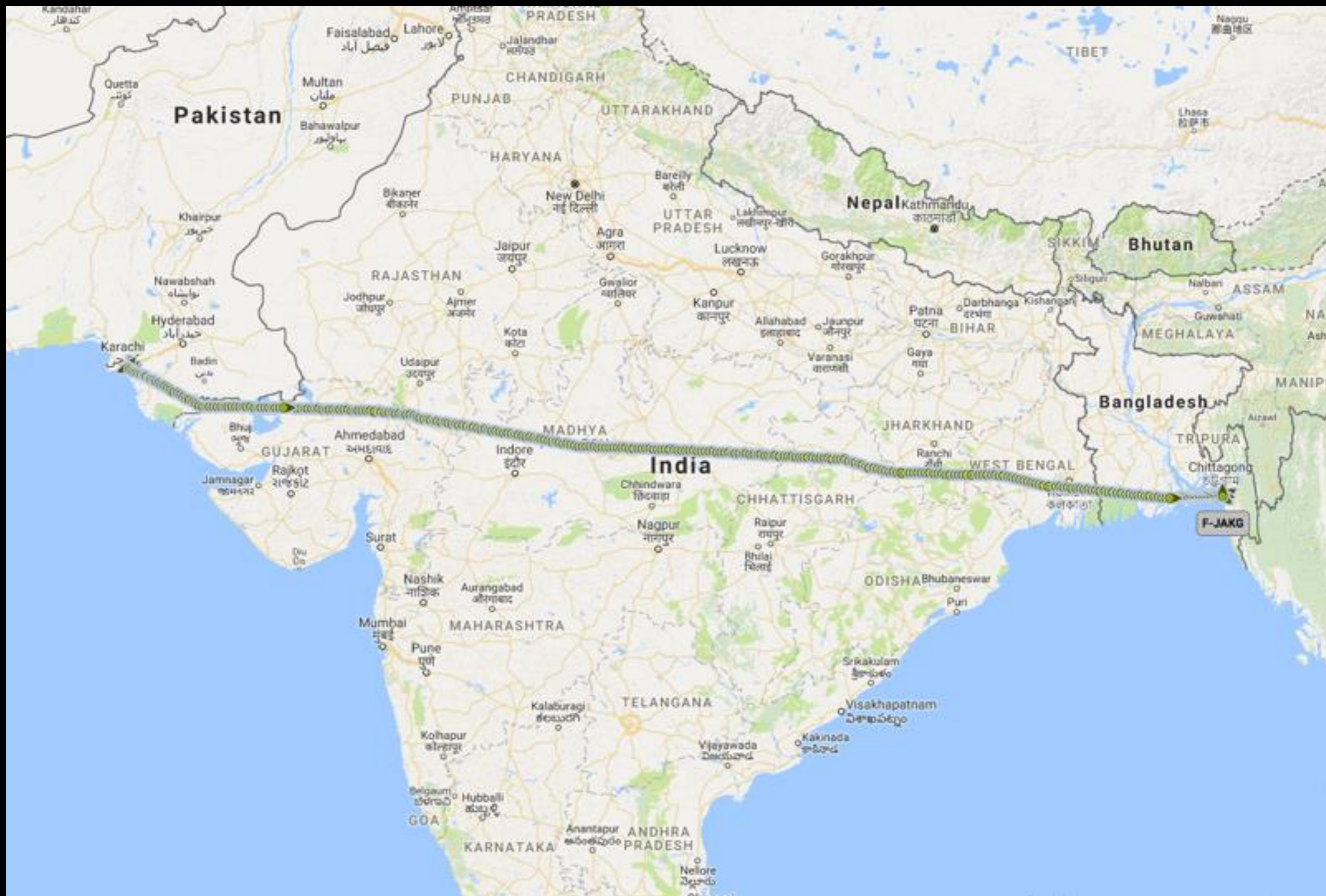


Lumar

Must

Lumar

ZERO
EMISSION
LIVING





F-JAKG

GARMIN

WPT BRG DIST EYE GS TRK MSA ETA

TELEM 118% 37.2% 16:47 133% 117% 2400: 00:42!

Altitude: 10130

Speed: 133

Heading: 117

Map: 3D View

Garmin MFD

Map: 2D View

Altitude: 10130

Speed: 133

Heading: 117

3D View

Altitude: 10130

Speed: 133

Heading: 117

Map: 3D View

LANDING GEAR

HYDR. PUMP FUEL PUMP LH FUEL RES. RH FUEL RES. WARNING CAUTION LANE A LANE B

START POWER TEST

RELEASE

PROLLER

ENGINE

LAND

STROBE

AUXILIARY

WAKE UP

NAV

MAP

BACK



PITOT | HYDR. PUMP | FUEL PUMP | LH FUEL RES. | RH FUEL RES. | WARNING | CAUTION | LANE A | LANE B | START POWER | TEST

F-JAKG

GARMIN

FJAKG	IDENT	Timer	WPT	BRG	DIST	ETE	GS	TRK	MSA	ETA
4132	ALT	08:27	SASRO	090°	89.5°	38:52	138	089°	2800'	01:35'

Main Menu

- XPDR
- Flight Log
- Flight Plan List
- VNAV
- Track Log
- User Timer
- User Waypoints
- Data Link
- Tools
- Setup
- Backlight Intensity

Heading: 103° | Altitude: 4132' | Speed: 138 KTS | Fuel: 1013 lbs



GARMIN

MUSIC | COMP | COMP | NAVY | NAVY | ALTY | ALTY

21 | 22 | COM1 MIC | COM2 MIC | TEL | PILOT ID | PROG | PROG



MAP | AIR TAMP | LAND | STROBE | W/CAUTIONS | W/CAUTIONS

EMERGENCY | MAIN FUEL PUMP

LANE A | LANE B

PROPELLER

PITOT



 **Lumar.**

 **Lumar.**

Lumar



 **Lumar.**

 **Green
World**







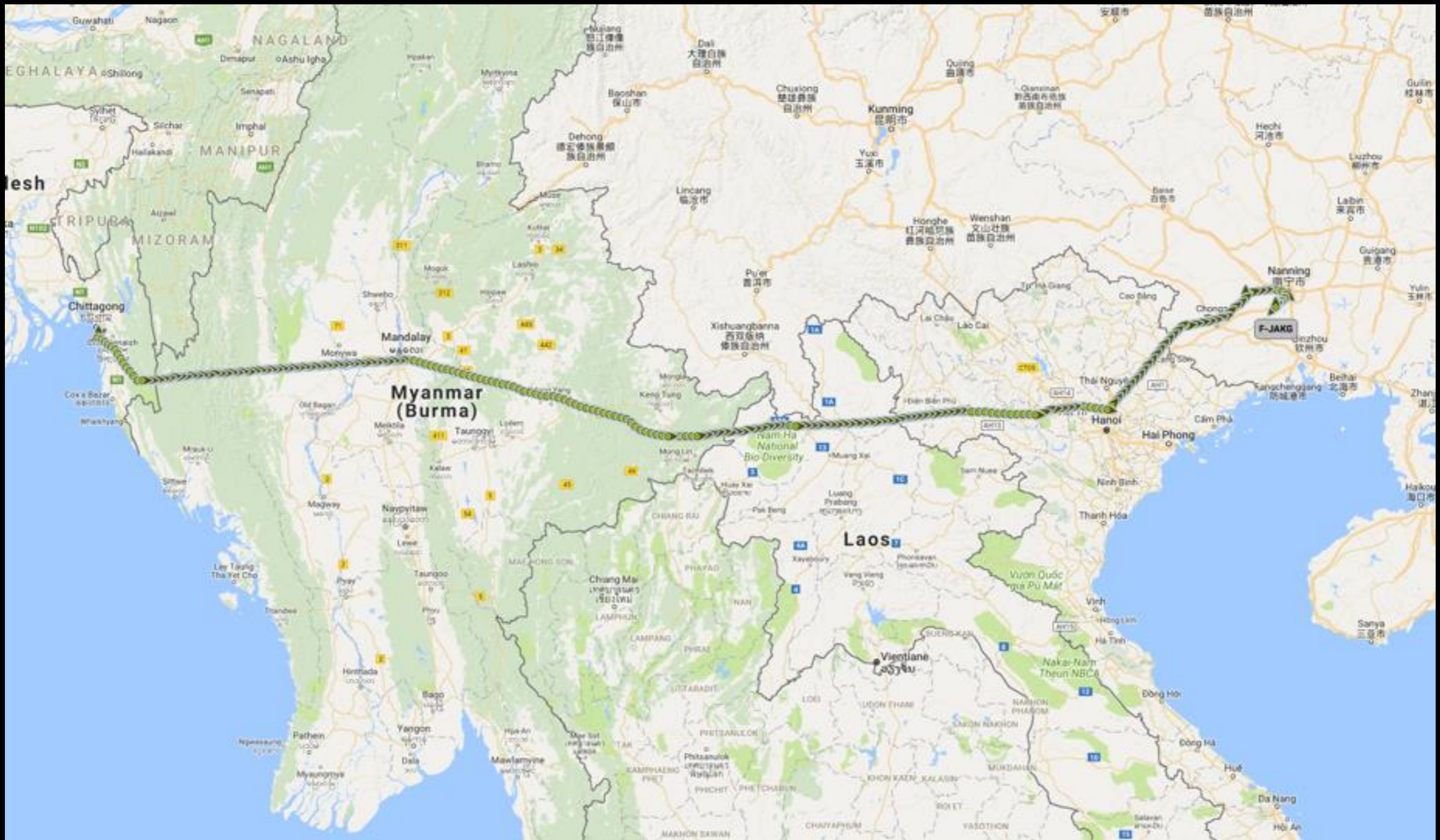
BLACK GARDEN

Lumina

I FEEL SLOVENIA

SLOVENIA CONTROL

ELE



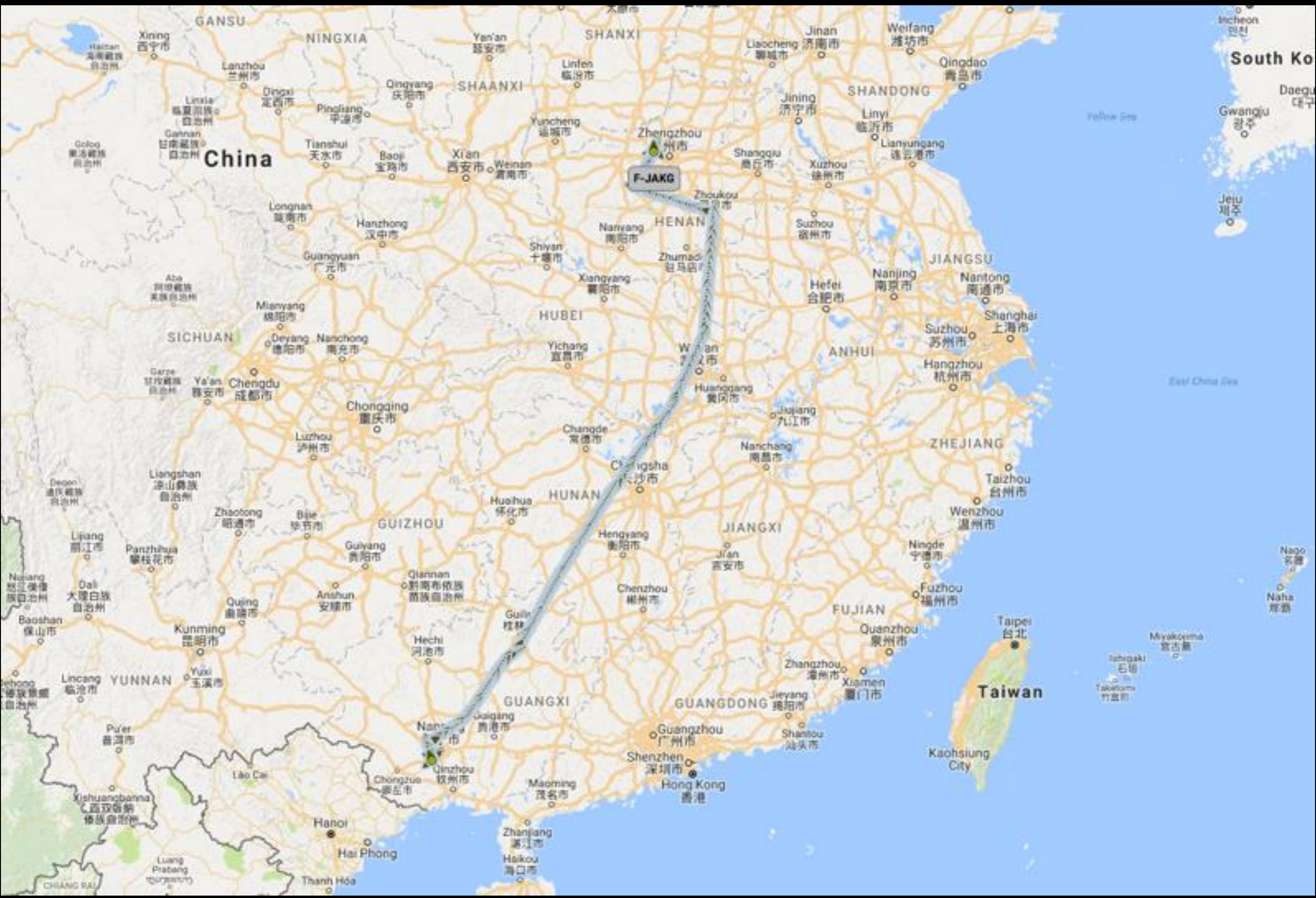


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ZERO
EMISSION
LIVING





China

South Ko

F-JAKG

Taiwan

GANSU

NINGXIA

SHANXI

SHAANXI

SHANDONG

HENAN

HUBEI

SICHUAN

ANHUI

JIANGSU

HUNAN

JIANGXI

GUIZHOU

FUJIAN

YUNNAN

GUANGXI

GUANGDONG

Incheon

Gwangju

Jeju

Daegu

Yellow Sea

East China Sea

Nago

Naha

Miyakoima

Ishigaki

Taketom

Taipei

Kaohsiung City

Xining

Lanzhou

Dingxi

Tianshui

Baoji

Xian

Weinan

Yuncheng

Shangqiu

Zhoukou

Nanyang

Xiangyang

Hefei

Nanjing

Suzhou

Hangzhou

Nantong

Shanghai

Suzhou

Hangzhou

Nantong

Shanghai

Aba

Mianyang

Deyang

Nanchong

Chongqing

Luzhou

Changde

Changsha

Huohua

Hengyang

Chenzhou

Jian

Nanchang

Jiujiang

Nanjing

Wenzhou

Ningde

Fuzhou

Quanzhou

Xiamen

Zhangzhou

Jieyang

Shantou

Deqin

Lijiang

Panzhihua

Dali

Baoshan

Kunming

Yuxi

Lincang

Puer

Lao Cai

Xishuangbanna

Liangzihu

Luang Prabang

Hanoi

Hai Phong

Thanh Hoa

Zhanjiang

Haikou

Shenzhen

Hong Kong

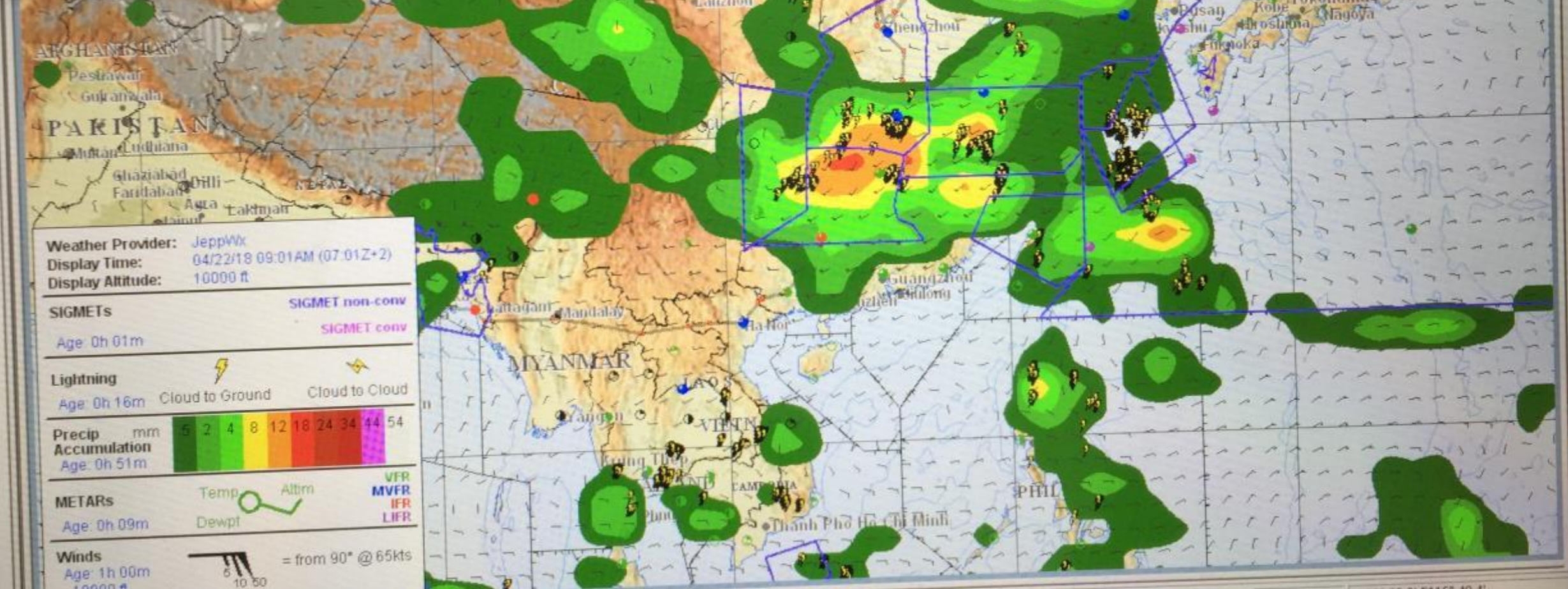
Guangzhou

Shenzhen

Hong Kong

0h:00m Sun 22 Apr 07:01Z ?

AIR FNTS IC LTG MTTF PRCP SIG TRB WND



Weather Provider: JeppWx
 Display Time: 04/22/18 09:01AM (07:01Z+2)
 Display Altitude: 10000 ft

SIGMETs SIGMET non-conv
SIGMET conv

Age 0h 01m

Lightning
 Age 0h 16m Cloud to Ground Cloud to Cloud

Precip Accumulation mm
 Age 0h 51m

5	2	4	8	12	18	24	34	44	54
---	---	---	---	----	----	----	----	----	----

METARs Temp Altim
 Age 0h 09m Dewpt

Winds = from 90° @ 65kts
 Age 1h 00m 10000 ft



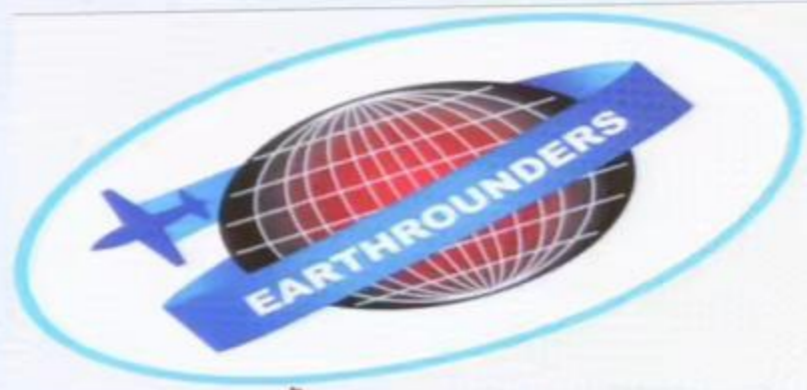


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 EMISSION

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EMISSION
LIVING



10th Earthrounder's Reunion



AirShow
Zhengzhou | 郑州航展

2018 郑州航展

暨世界编队特技飞行年度颁奖盛典

主办单位：环球网、郑州航展有限公司
支持单位：郑州市人民政府、河南省体育局、河南省民航发展办公室、郑州市航空港区管理委员会、郑州航空港区文化发展中心







PITOT | HYDR. PUMP | FUEL PUMP | LH FUEL RES. | RH FUEL RES. | WARNING | CAUTION | LANE A | LANE B

START POWER TEST

GARMIN

FJAKG	IDENT	Timer	WPT	BRG	DIST	ETE	GS	TRK	MSA	ETA
3462	ALT	46:14	ZHO	010°	12.5%	06:48	110:	009%	549m	07:41

MAN IN 20.0
RPM 5030
LPH 17.3
EGT °C 720
FUEL QTY

AS 133
140
130
120
111
100
90
80
70
60
50
40
30
20
10
0

3300
3350
3325
3275
3250
1013m

HEX 010° TRK 009° CRS 010°
GPS 3.00%
TRK 010° GHT 2°C MFC 07:34:15

1100 FT
110 KT
ENR
GPS

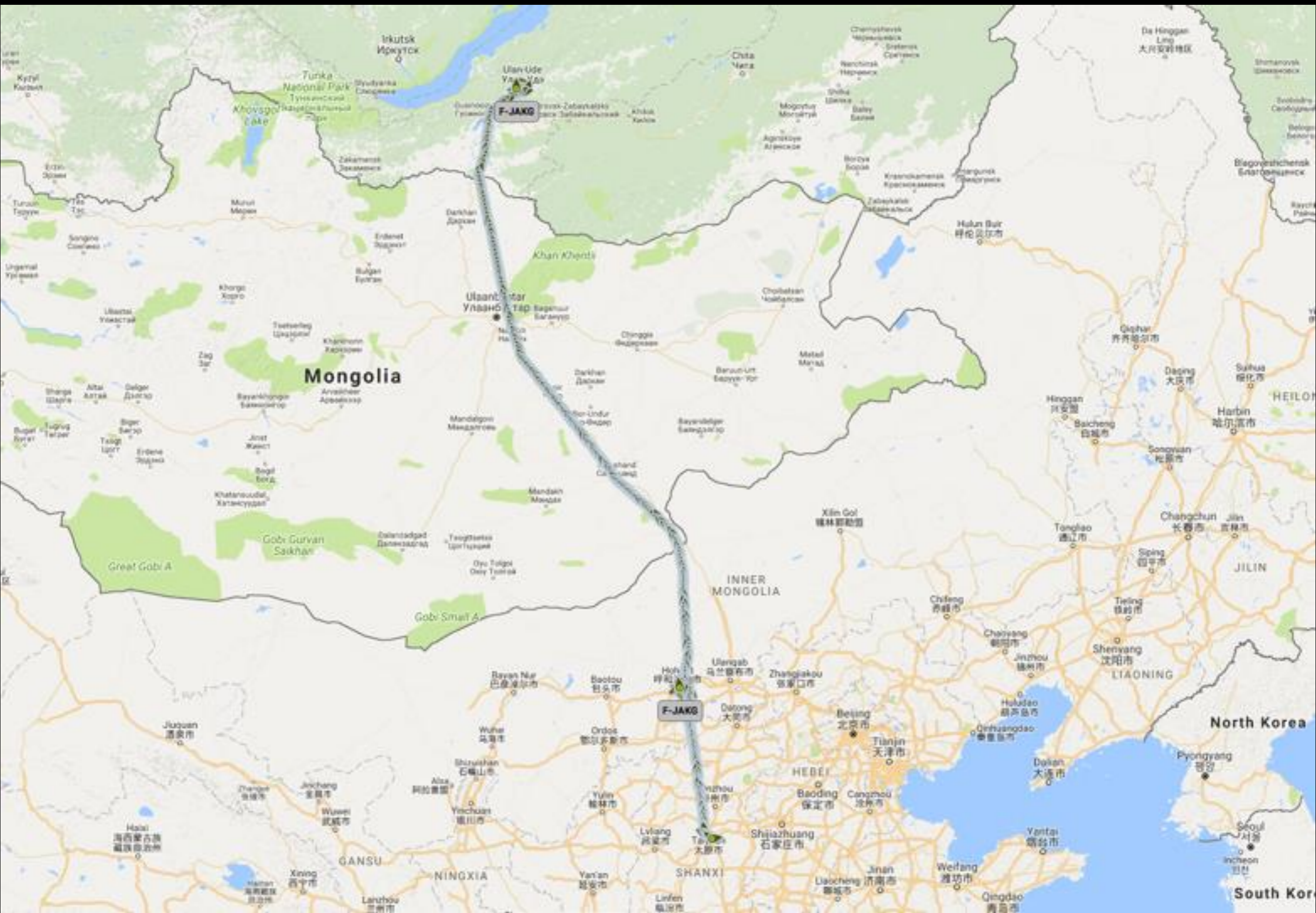
LANDING GEAR

DOWN UP

GARMIN
MUSIC COM1 COM2
COM1 MIC COM2 MIC

AP AUX F. PUMP LAND STR

EMERGENCY



Mongolia

INNER MONGOLIA

North Korea

South Korea

F-JAKS

F-JAKS

Ulaanbaatar
Улаанбаатар

Ulaan-Ude
Улан-Удэ

Hohhot
呼和浩特

Gobi Gurvan Saikhan

Great Gobi A

Gobi Small A

Xin Gol
新巴尔鲁克盟

Beijing
北京市

Tianjin
天津市

Shenyang
沈阳市

Changchun
长春市

Harbin
哈尔滨市

Daqing
大庆市

Hulun Buir
呼伦贝尔市

Alxa
阿拉善盟

Shizuishan
石嘴山市

Wuhai
乌海市

Ordos
鄂尔多斯市

Yulin
榆林市

Lvliang
吕梁市

Shijiazhuang
石家庄市

Shijiazhuang
石家庄市

Cangzhou
沧州市

Heilongjiang
黑龙江省

Qinhuangdao
秦皇岛市

Dalian
大连市

Yantai
烟台市

Qingdao
青岛市

Shanghai
上海市

Pyongyang
平壤

Seoul
서울

Incheon
인천

Chengde
承德市

Shijiazhuang
石家庄市

Chengde
承德市

Shijiazhuang
石家庄市

Chengde
承德市

Shijiazhuang
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Shijiazhuang
石家庄市

Chengde
承德市












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ZERO
EMISSION
LIVING





Lumar

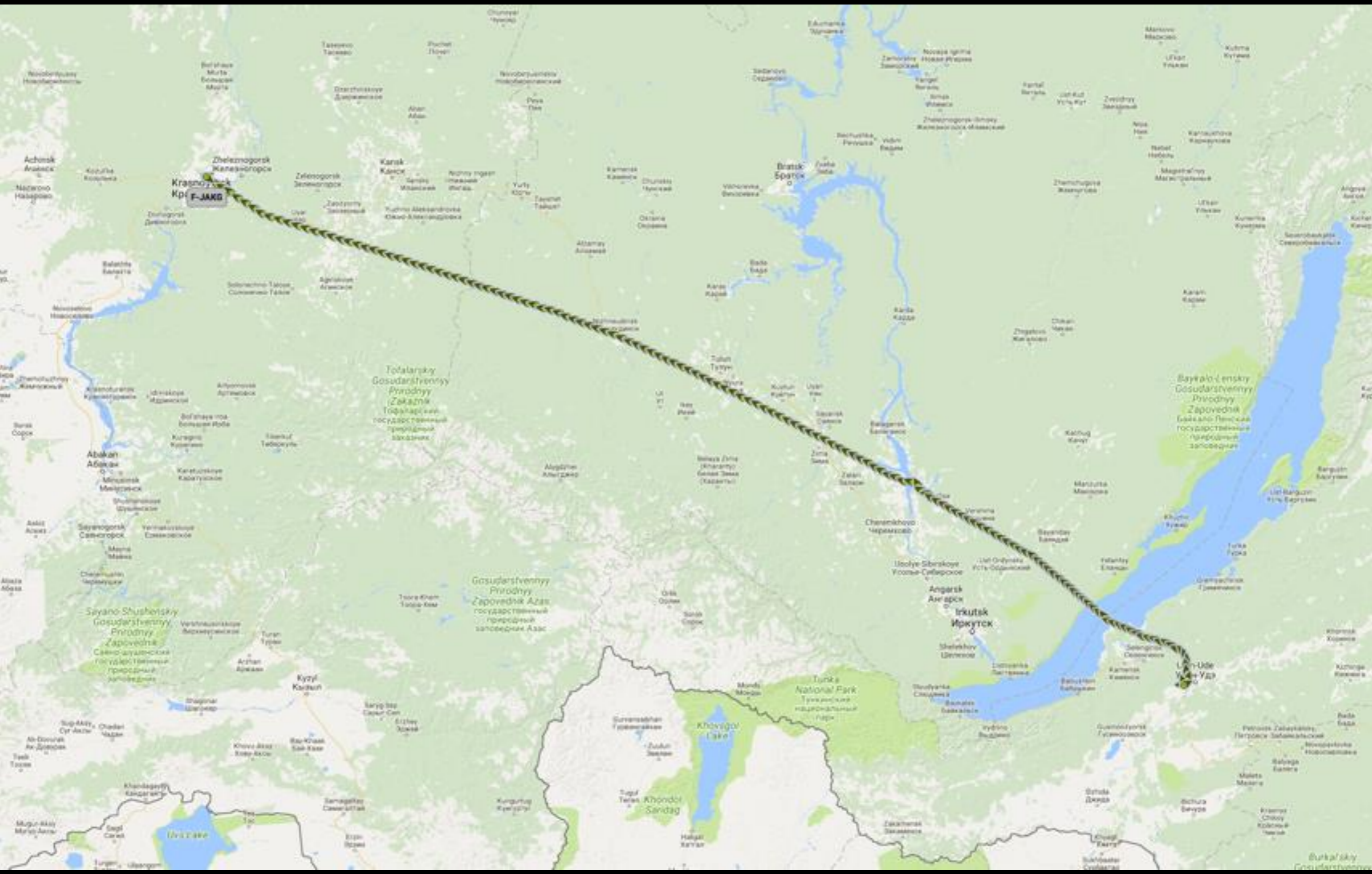
EMUST

Lumar



ZERO
EMISSION
LIVING









Lumar

VER

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VER
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LM





Lumar

Lumar
ZERO
EMISSIONS





Carbon Pollution Research Asia 2018 Lumar

ener

WT9 D

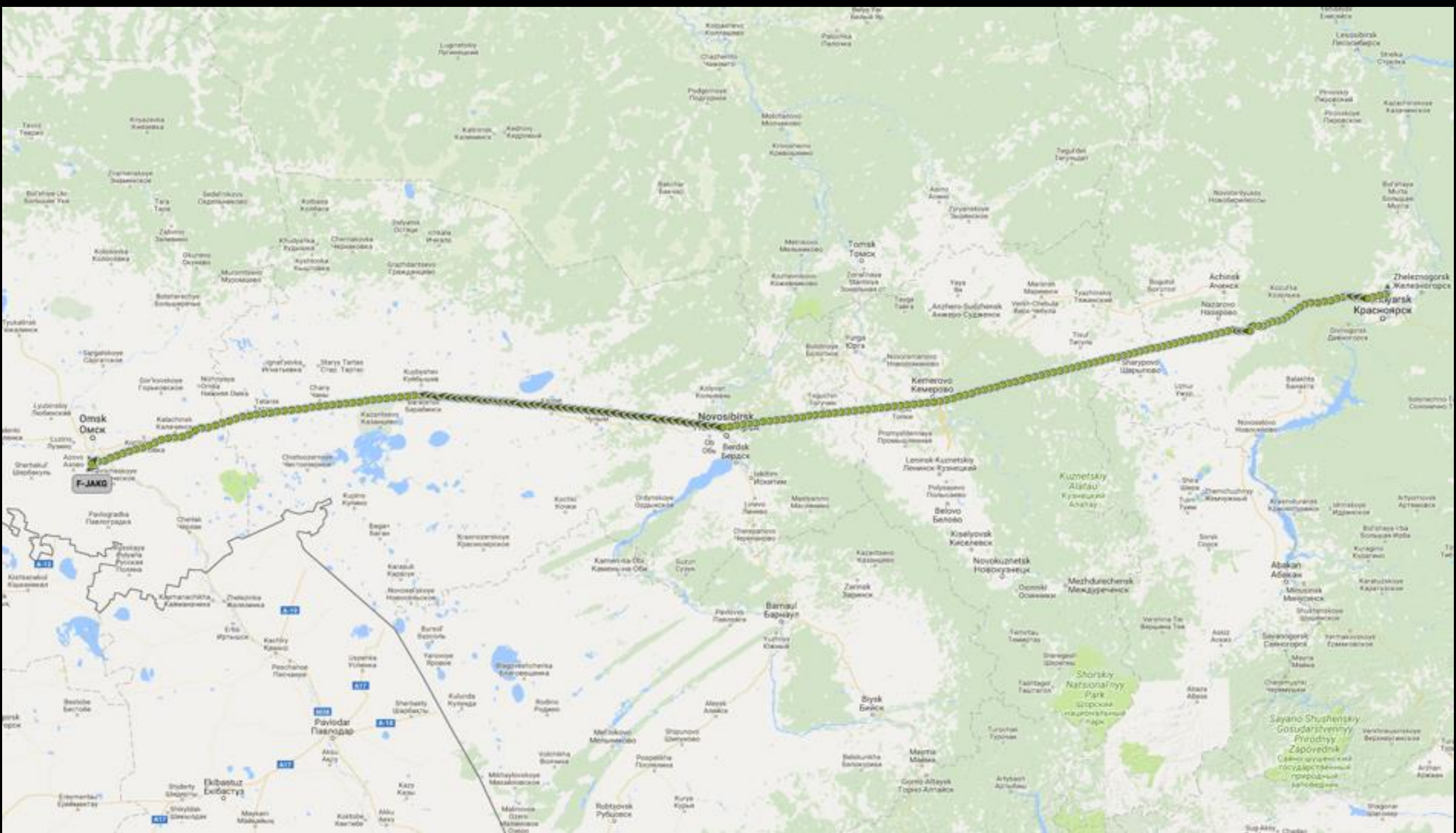
P261MH 124

Carbon Pollution Research Asia 2018
Lumar
LET'S
EMISSION
LIVING



 **Lumar.**

 **Lumar.**









UNOL 54°45'43"С 073°18'39"В
«ВИРАЖ-КОНТРОЛЬ» 123.300





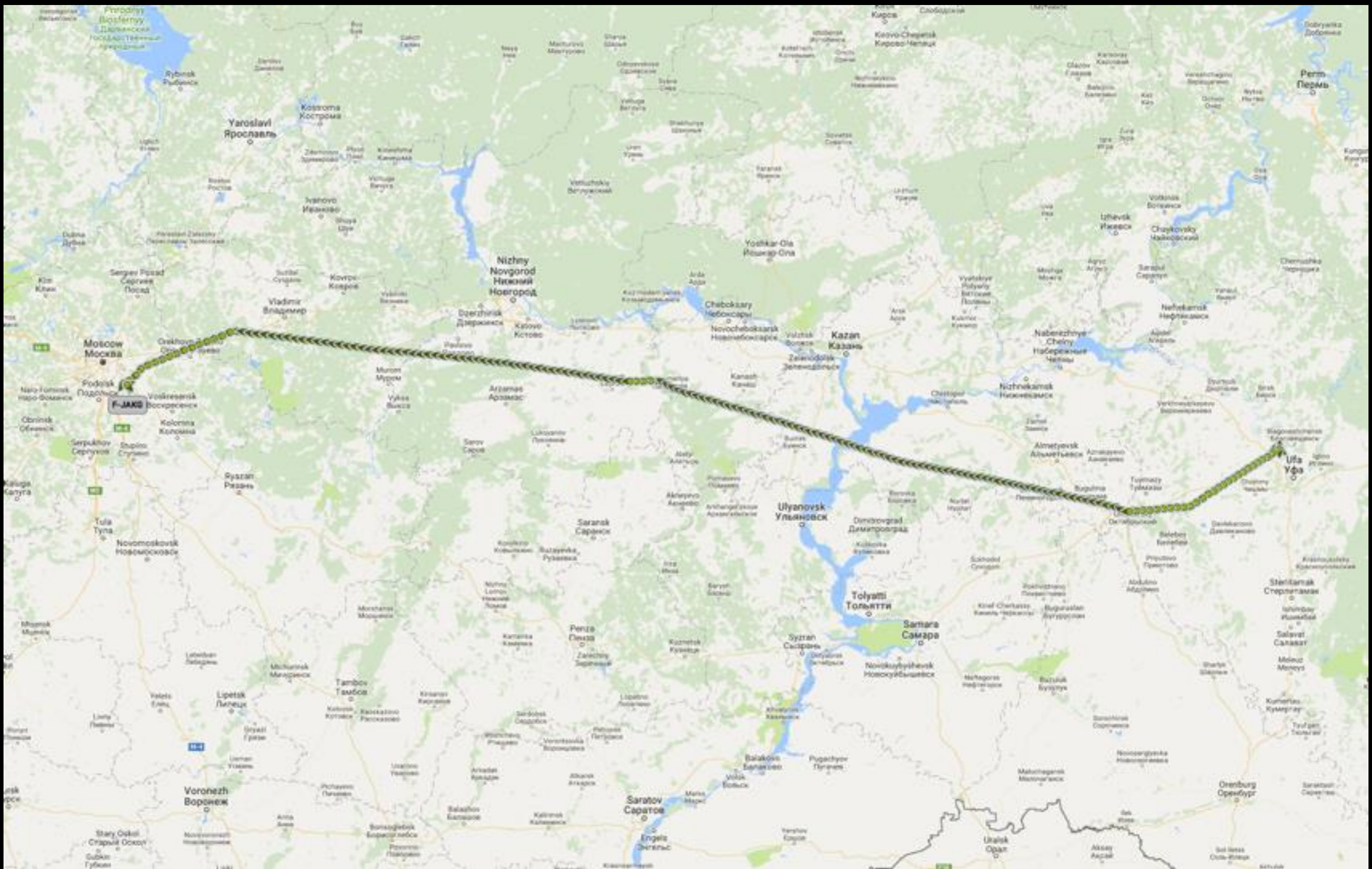
 Lumar

 Lumar

 Lumar

 Lumar





Yaroslavl Ярославль

Nizhny Novgorod Нижний Новгород

Kazan Казань

Ulyanovsk Ульяновск

Tolyatti Тольятти

Samara Самара

Ufa Уфа

Moscow Москва

Ryazan Рязань

Saransk Саранск

Penza Пенза

Saratov Саратов

Voronezh Воронеж

Orenburg Оренбург

Perm Пермь

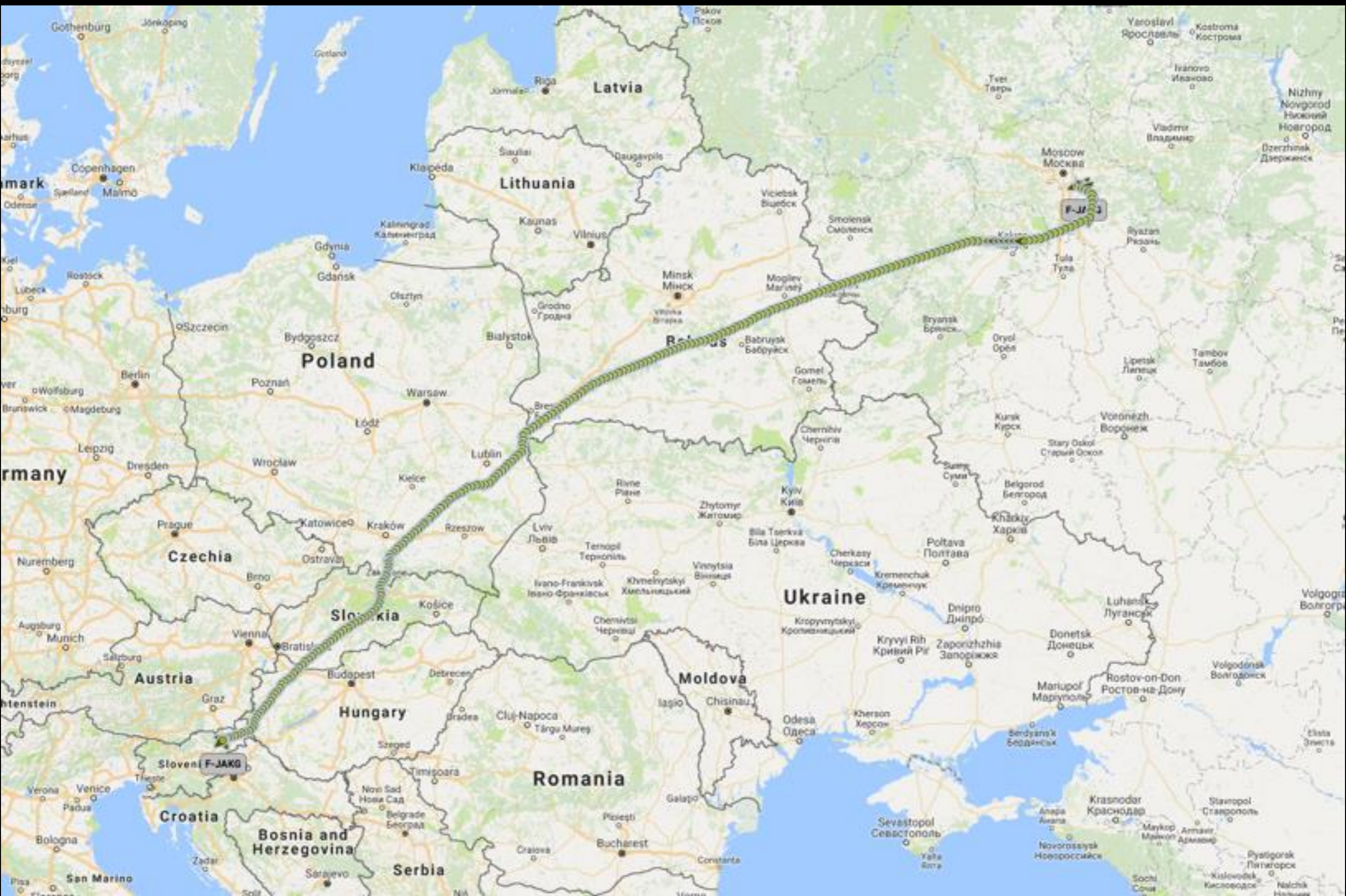


Lumar

EMERSON

LUMINA
ZERO
EMISSION
LIVING









FUEL PUMP | LH FUEL RES. | RH FUEL RES. | WARNING | TEST | LANE B



F-JAKG

LANDING (Green), GEAR (Green), UP (Green), DOWN (Green), TEST (Red)

GARMIN GAMA 240

MUSIC, COM1, COM2, MON MUTE, NAV1, NAV2, AUX1, AUX2, ICS, PILOT ISO, RADIO

Com Vol, Stormscope, HDG UP, COM 125.500, STBY 124.300, ETE 28:55, Mode: Strike, Rate: 24

GARMIN

WPT: DIMLO, ETV: 40:49, DIST: 64.4, ETE: 28:56, GS: 134

Main: OIL BAR 3.5, OIL °C 92, QTY L 38, LPH 15.7

Electrical: MAN IN 23.7, RPM 4990

Engine Hours 698.2

AUX F. PUMP, LAND, STROBE, WIDONICS, HYD. PUMP

EMERGENCY MAIN F. PUMP

LANE A, LANE B

PROPELLER

THROTTLE (with keys)

PITOT

RELEASE, HOLD

VENT PULL

CARTRIDGE HEATING PULL TO OPEN



ČRNI OGLJIK

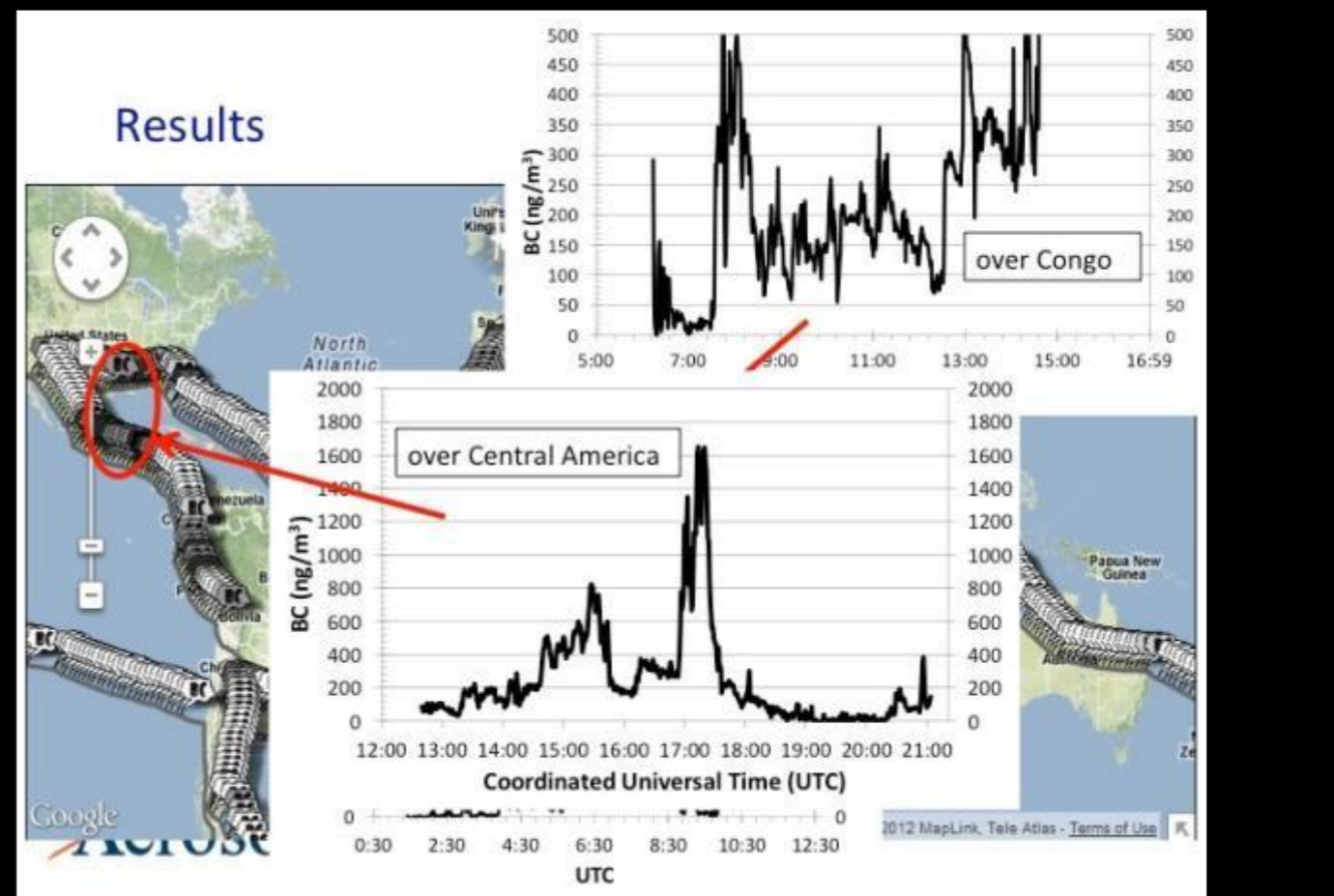
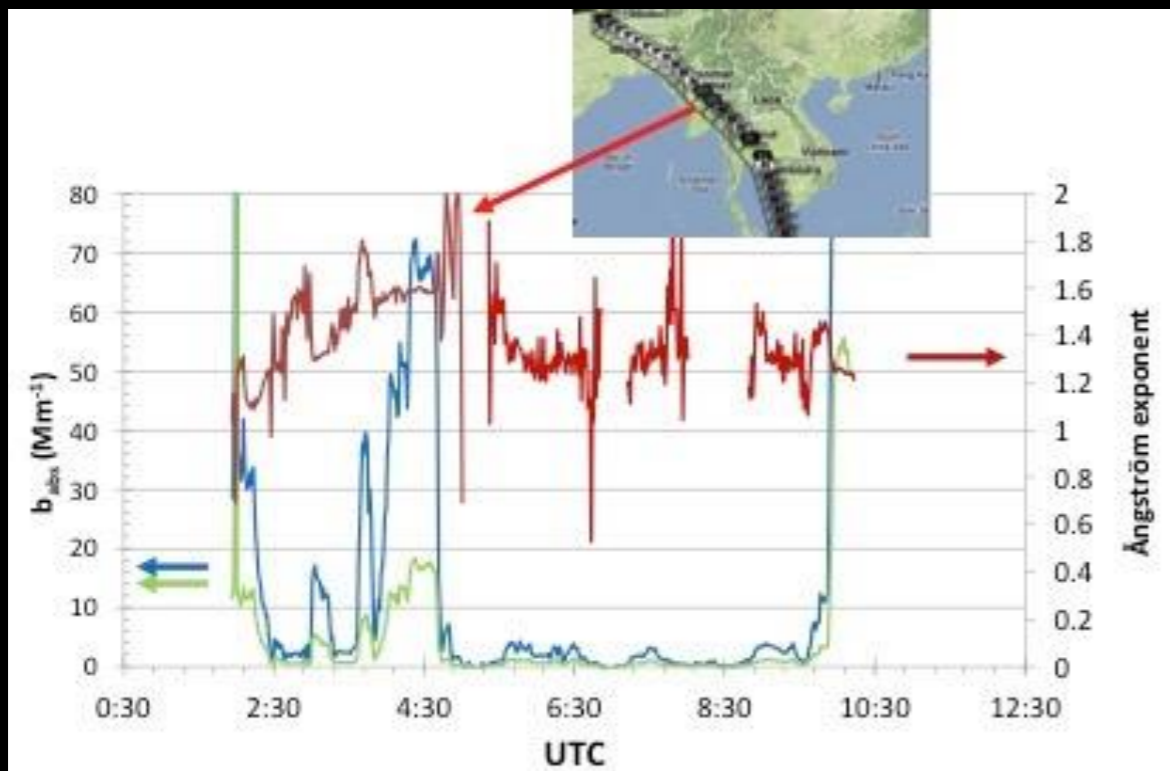
dr. Griša Močnik, dr. Luka Drinovec

Inštitut Jožef Štefan



Photo: Leon Vidic

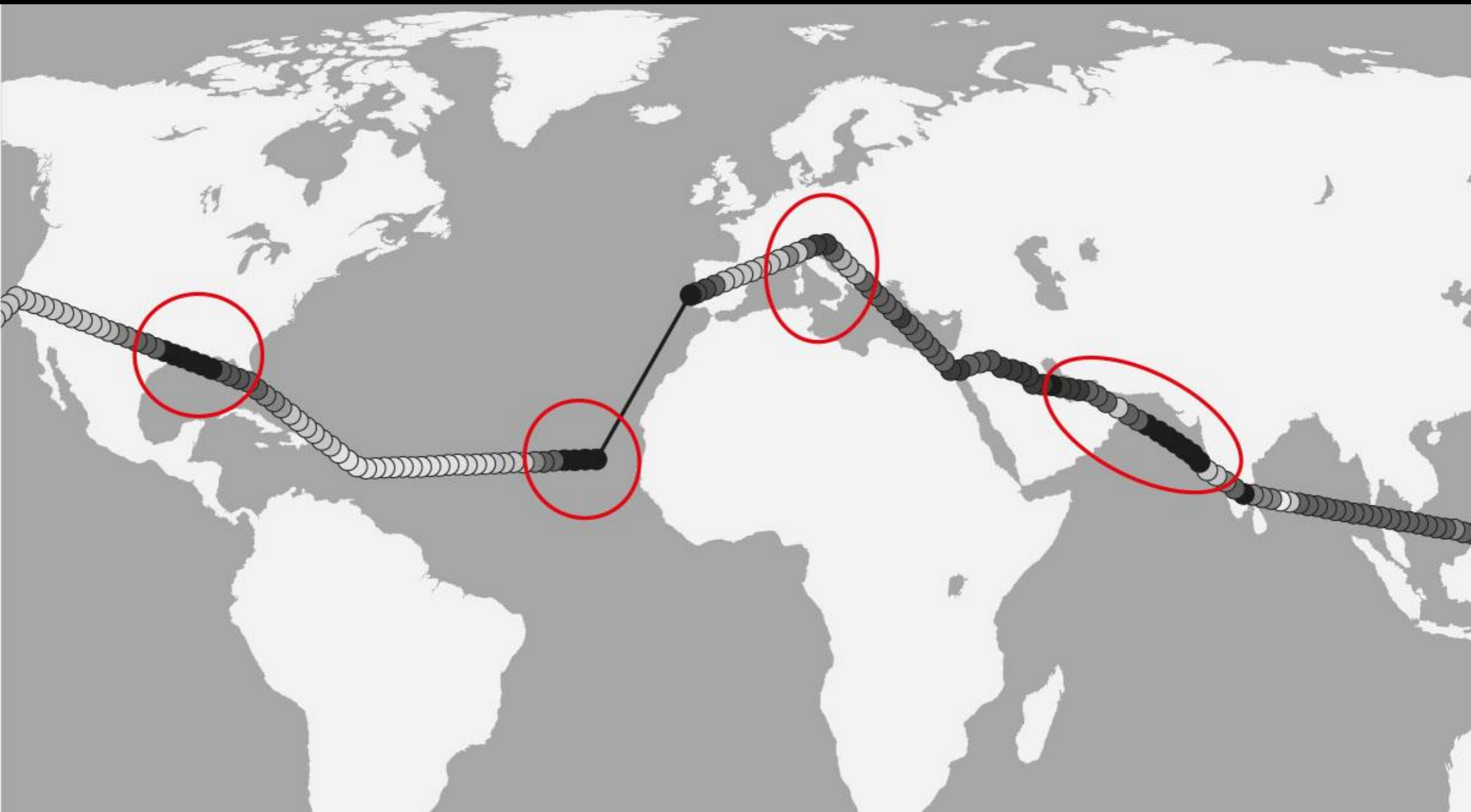
2012 - 2016



Black Carbon pollution 2012



Black Carbon pollution 2016



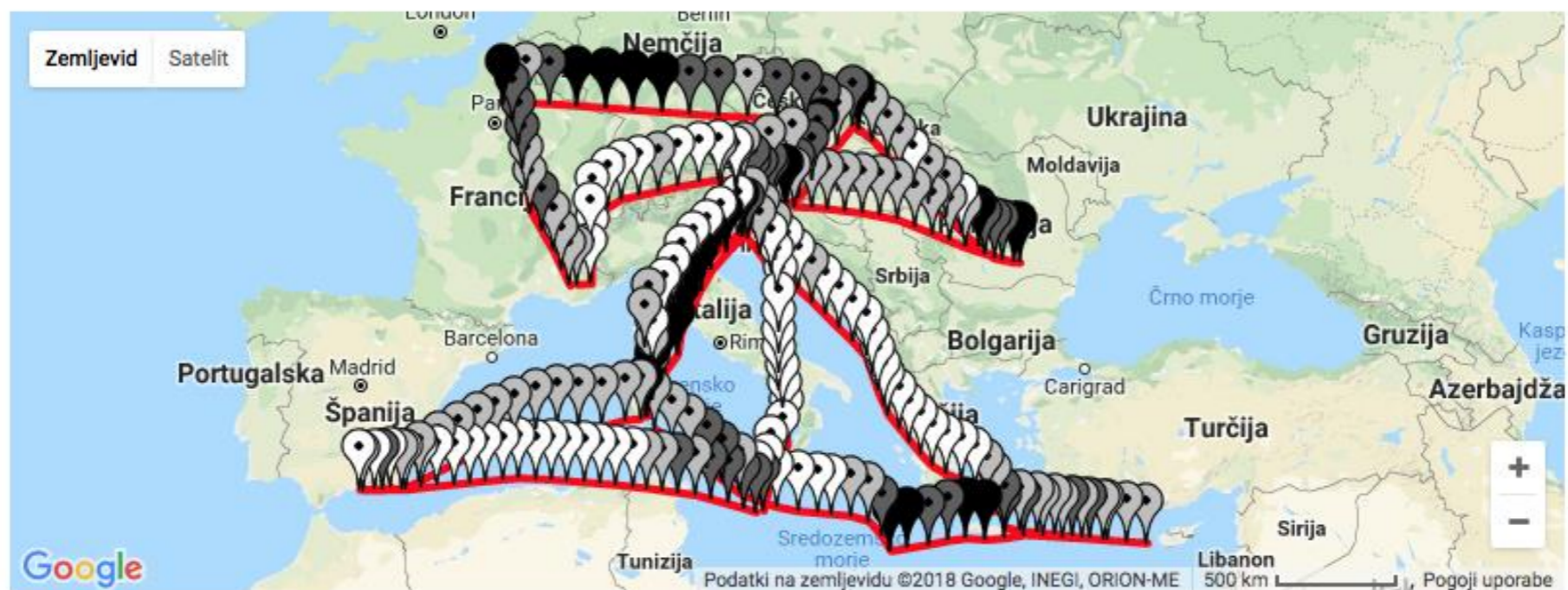
Black Carbon pollution 2017

Black Carbon Measurements

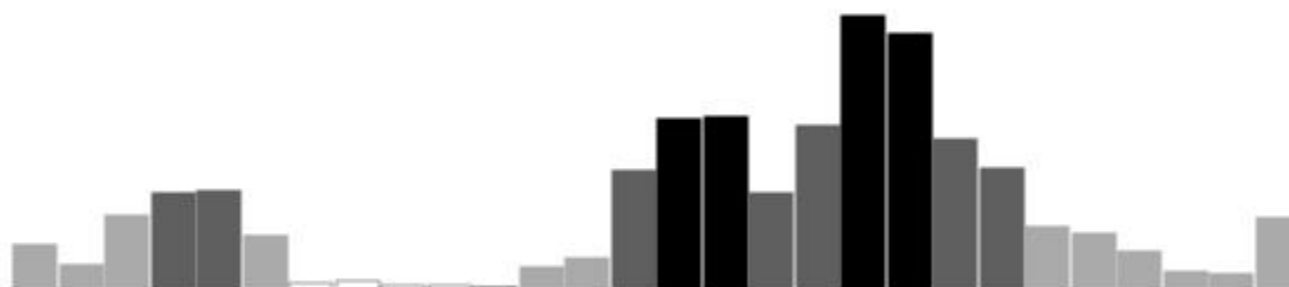
Cagliari (Italy) - Paphos (Cyprus): 2.314km, 9h 40mins

5.4.2017 05:09 - 14:49 UTC

6. Cagliari (Italy) - Paphos (Cyprus)



0-50 ng/m³, 50-250 ng/m³, 250-500 ng/m³, > 500 ng/m³

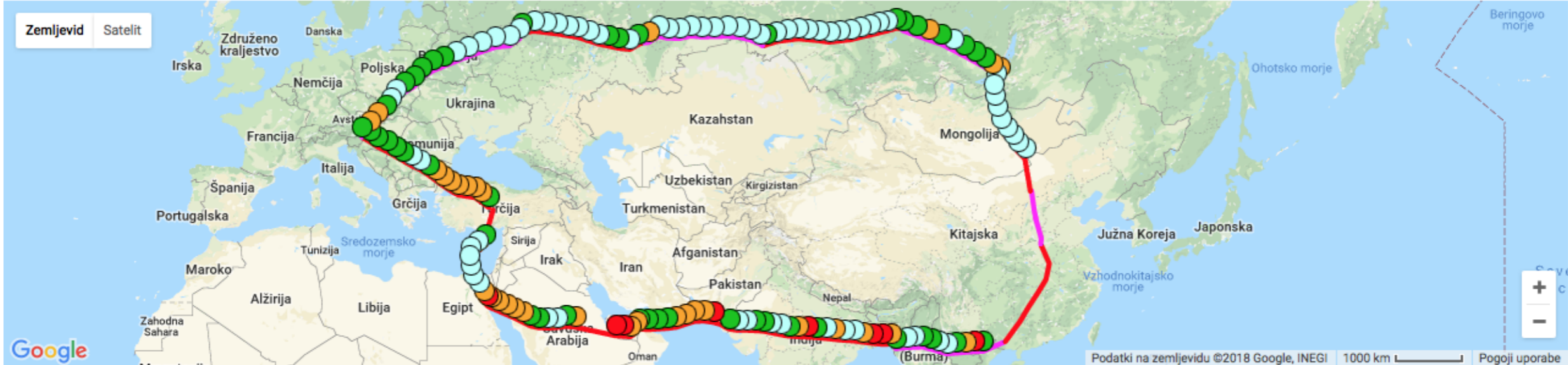


Black Carbon Measurements

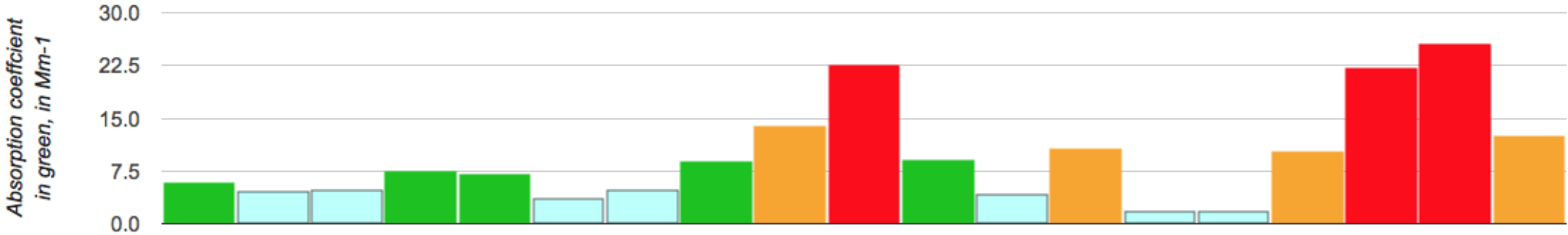
Karachi (Pakistan) - Chittagong (Bangladesh): 2.585km, 10h 16mins

17.4.2018 23:31 - 18.4.2018 9:47 UTC

5. Karachi (Pakistan) - Chittagong (Bangladesh)



0-4.9 Mm⁻¹ 5-9.9 Mm⁻¹ 10-19.9 Mm⁻¹ > 20 Mm⁻¹



Aerosol absorption is measured in inverse mega-meters (Mm⁻¹), the absorption shown in the graph above is measured in green, where the solar spectrum is at maximum. Black carbon absorbs sunlight very efficiently.

Ekipa GLWF



Boj proti CO2 je izjemno drag in dolgotrajen,
tehnične rešitve ne obstajajo

Boj proti črnemu ogljiku je cenejši, tehnične rešitve
imamo že sedaj

KAJ MORAMO STORITI

Učinkovito kurjenje

Filtri

Javni transport

Centralno ogrevanje

Električna mobilnost

Energetsko učinkovita bivališča

ZELENA ENERGIJA?

Sončne elektrarne?

Veterne elektrarne ?

Hydroenergija ?

Energija plimovanja ?

Geotermalna energija ?

Jedrska energija?

DOVOLJ

