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Supplement of

BAERLIN2014 – stationary measurements and source apportionment at an urban background station in Berlin, Germany

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Section S1. NMVOC data:

As stated in the main text of the paper, to be able to make reasonable comparisons with previous work regarding the contribution of different compound classes to the measured mixing ratios of NMVOCs, as well as the OH reactivity attributed to these NMVOCs, a subset of the compounds was selected and used in the analysis. This subset was based on a number of different papers in the literature, and those compounds that were regularly included in OH reactivity calculations (e.g., (Dolgorouky et al., 2012; Gilman et al., 2009; Goldan et al., 2004; Liu et al., 2008)). This includes 57 NMVOCs, and while this does not capture the complete OH reactivity, it allows for more equal comparisons with other studies. The 57 NMVOCs included, are as follows:

Alkanes: cyclohexane, cyclopentane/2,3-dimethylbutane, ethane, heptane, methylcyclohexane, methylcyclopentane, n-decane, n-hexane, n-octane, n-pentane, propane, 2-methylbutane, 2-methylheptane, 2-methylhexane, 2-methylpentane, 2-methylpropane, 2,2-dimethylbutane, 2,3-dimethylpentane, 3-methylpentane

Alkenes and alkynes: cis-2-butene, cis-2-pentene, ethyne, i-butene, 1-butene, propene, trans-2-butene, trans-2-pentene, 1-pentene, 1,3-butadiene, 2-methyl-1-butene, 2-methyl-2-butene, 3-methyl-1-butene

Aromatics: benzene, ethylbenzene, i-propylbenzene, m-ethyltoluene, m-/p-xylene, n-propylbenzene, o-ethyltoluene, o-xylene, p-ethyltoluene, styrene, toluene, 1,2,3-trimethylbenzene, 1,2,4-trimethylbenzene/t-butylbenzene, 1,3,5-trimethylbenzene

Oxygenated: acetaldehyde, acetone, ethanol, MEK, methanol, 2-propanol

Biogenics and their oxidation products: α-pinene, β-pinene, isoprene, methacrolein, methylvinylketon

For information on individual mixing ratios by location, see Bonn et al. 2016.

Table S1. Details of the NMVOC measurements.

Instrument	Compounds or m/z measured	Detection limits	Sampling interval
PTR-MS	28, 29, 31, 33, 34, 35, 38, 39, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 53, 55, 56, 57, 59, 60, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 86, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 113, 115, 117, 119, 121, 127, 129, 132, 135, 137, 143, 147, 149, 151, 155, 157, 181, 205	varies (10s of pptv), see Bourtsoukidis et al., 2012	4.5 minutes
AMA Instruments GC5000 BTX	benzene, toluene	30 pptv	30 min data
Canister samples	Ethene, Ethyne, Ethane, Propene, Propane, Propyne, Acetaldehyde, 2-Methylpropane, Methanol, 1-Butene/i-butene, 1,3-Butadiene, n-Butane, trans-2-Butene, cis-2-Butene, 1,2-Butadiene, Ethanol, 3-Methyl-1-butene, 2-Methylbutane, Acetone, 1-Pentene, 2-Propanol, 2-Methyl-1-butene, n-Pentane, Isoprene, trans-2-Pentene, cis-2-Pentene, Propanal, 2-Methyl-2-butene, Acetic acid methyl ester, 1,3-Pentadiene, Cyclopentadiene, 2,2-Dimethylbutane, 2-Butanol, 1-Propanol, Cyclopentene, Methacrolein, Cyclopentane/2,3-dimethylbutane, 2-Methylpentane, Methyl vinyl ketone, Butanal, 1-Hexene, 3-Methylpentane, 2-Methyl-1-pentene, n-Hexane, trans-2-Hexene, cis-2-Hexene, 1,3-Hexadiene, Methylcyclopentane, 2,4-Dimethylpentane, Methylcyclopentene, Benzene, 1-Butanol, Cyclohexane, 2-Methylhexane, 2,3-Dimethylpentane, 3-Methylhexane, Pentanal, Cyclohexene, 1,3-Dimethylcyclopentane, 1-Heptene, 2,2,4-Trimethylpentane, Heptane, 2,3-Dimethyl-2-pentene, Octene, Methylcyclohexane, 2,3,4-Trimethylpentane, Toluene, 2-Methylheptane, 4-Methylheptane, 3-Methylheptane, Hexanal, Acetic acid butyl ester, n-Octane, Dimethylcyclohexane isomer, Ethylbenzene, m/p-Xylene, Heptanal, Styrene, 1-Nonene, o-Xylene, n-Nonane, i-Propylbenzene, α-Pinene, n-Propylbenzene, m-Ethyltoluene, p-Ethyltoluene, 1,3,5-Trimethylbenzene, Sabinene, o-Ethyltoluene, Octanal, β-Pinene, 1,2,4-Trimethylbenzene/t-butylbenzene, n-Decane, 1,2,3-Trimethylbenzene, Limonene, Eucalyptol, Indane, 1,3-Diethylbenzene, 1,4-Diethylbenzene, Butylbenzene, n-Undecane, n-Dodecane, n-Tridecane	5-20 ppt (see Urban 2010, Table 3.3 for individual LOD)	Intermittent (non-continuous) samples
Cartridge samples	Isoprene, 2-methyl-3-butenol, α-pinene, camphene, β-pinene, 3Δ-carene, p-cymene, 1,8-cineol, limonene, terpinolene, 4-acetyl-1-methylcyclohexene, nopinone, bornylacetate, longicyclene, iso-longifolene, β-caryophyllene, aromadendrene, α-humulene, Benzene, Toluene, Ethylbenzene, p/m-xylene, styrene, o-xylene, propylbenzene, 3-ethyltoluene, 4-ethyltoluene, 1,3,5-trimethylbenzene, 2-ethyltoluene, 1,2,4-trimethylbenzene, 1,2,3-trimethylbenzene, hexane, heptane, octane, nonane, decane	3-60 ng/m^3 (see main text and Mäki et al. (2017) for more details)	Intermittent (non-continuous) samples

Table S2. Pearson correlation coefficients (r) with 95% confidence intervals for hourly data.

	RH (%)	O_3 (µg m^{-3})	NO (µg m^{-3})	NO_2 (µg m^{-3})	CO (mg m^{-3})	Benzene (µg m^{-3})	Toluene (µg m^{-3})	PM_{10} (µg m^{-3})	MLH (m)	PKW at MC220 (count)	PKW at MC143 (count)
Temp (°C)	-0.71 [-0.72, -0.70]	0.82 [0.81, 0.83]	-0.28 [-0.31, -0.26]	-0.38 [-0.40, -0.35]	-0.26 [-0.28, -0.23]	-0.14 [-0.17, -0.11]	-0.15 [-0.18, -0.13]	0.36 [0.34, 0.38]	0.50 [0.47, 0.53]	0.60 [0.58, 0.63]	0.55 [0.52, 0.57]
RH (%)	1	-0.76 [-0.77, -0.74]	0.17 [0.15, 0.20]	0.17 [0.14, 0.20]	0.13 [0.10, 0.15]	0.08 [0.06, 0.11]	0.15 [0.13, 0.18]	-0.18 [-0.21, -0.15]	-0.66 [-0.69, -0.64]	-0.74 [-0.75, -0.72]	-0.70 [-0.72, -0.68]
O_3 (µg m^{-3})		1	-0.39 [-0.41, -0.36]	-0.57 [-0.58, -0.55]	-0.43 [-0.45, -0.41]	-0.33 [-0.35, -0.30]	-0.34 [-0.36, -0.31]	0.24 [0.22, 0.27]	0.59 [0.57, 0.62]	0.55 [0.52, 0.58]	0.50 [0.47, 0.53]
NO (µg m^{-3})			1	0.58 [0.56, 0.59]	0.72 [0.70, 0.73]	0.53 [0.51, 0.55]	0.49 [0.47, 0.51]	0.09 [0.06, 0.11]	-0.20 [-0.24, -0.16]	-0.06 [-0.11, -0.02]	0.00 [-0.04, 0.04]
NO_2 (µg m^{-3})				1	0.82 [0.81, 0.83]	0.63 [0.62, 0.65]	0.51 [0.49, 0.53]	0.11 [0.08, 0.14]	-0.29 [-0.33, -0.25]	-0.06 [-0.10, -0.02]	-0.05 [-0.09, -0.01]
CO (mg m^{-3})					1	0.71 [0.70, 0.72]	0.59 [0.57, 0.60]	0.16 [0.14, 0.19]	-0.22 [-0.26, -0.18]	0.01 [-0.03, 0.05]	0.02 [-0.02, 0.06]
Benzene (µg m^{-3})						1	0.79 [0.78, 0.80]	0.23 [0.21, 0.26]	-0.15 [-0.20, -0.11]	0.02 [-0.02, 0.06]	0.02 [-0.02, 0.06]
Toluene (µg m^{-3})							1	0.17 [0.14, 0.20]	-0.15 [-0.19, -0.10]	-0.06 [-0.10, -0.01]	-0.07 [-0.11, -0.03]
PM_{10} (µg m^{-3})								1	0.04 [-0.00, 0.08]	0.19 [0.15, 0.23]	0.12 [0.08, 0.16]
MLH (m)									1	0.53 [0.48, 0.57]	0.48 [0.43, 0.52]
PKW at MC220 (count)										1	0.94 [0.93, 0.94]

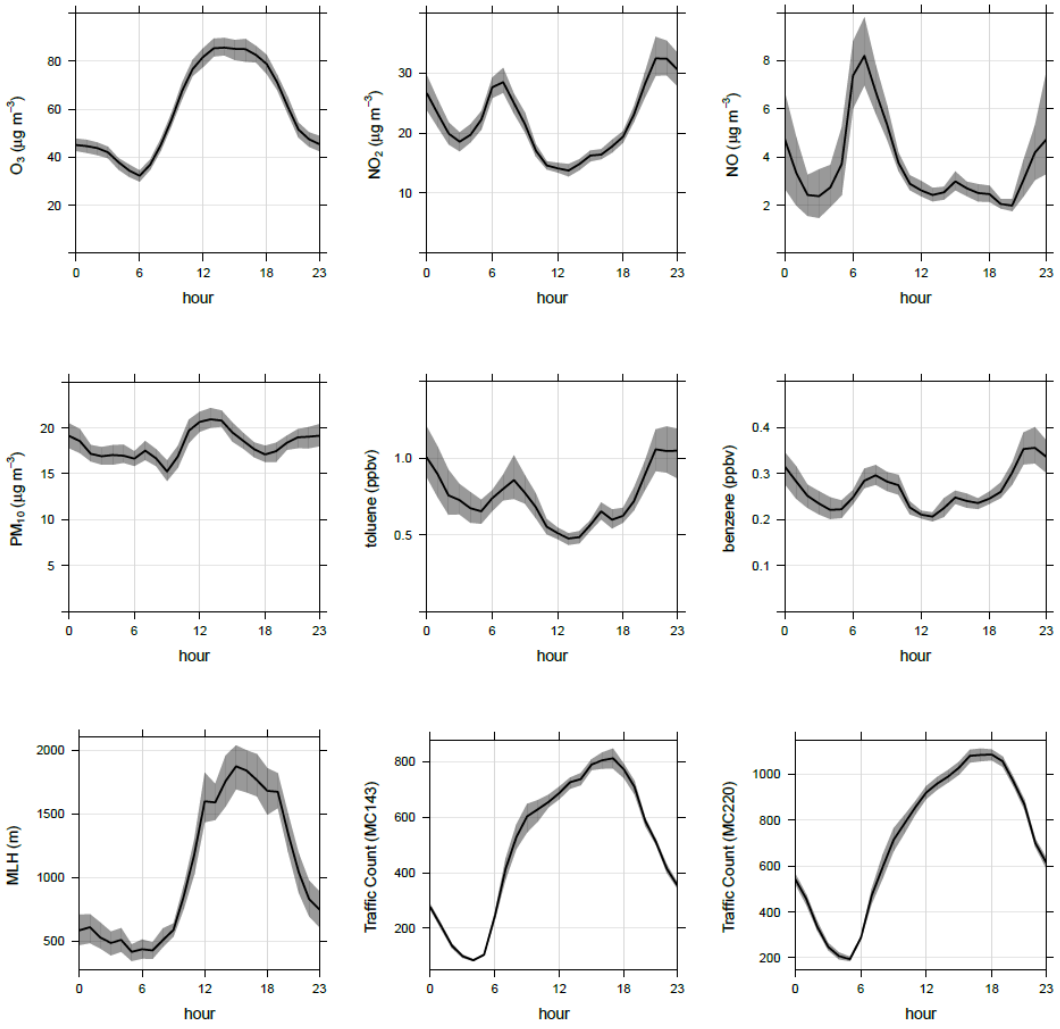


Figure S1. Diurnal variation in air pollutants and MLH measured in Neukölln, and traffic counts from the MC143 and MC220 locations.

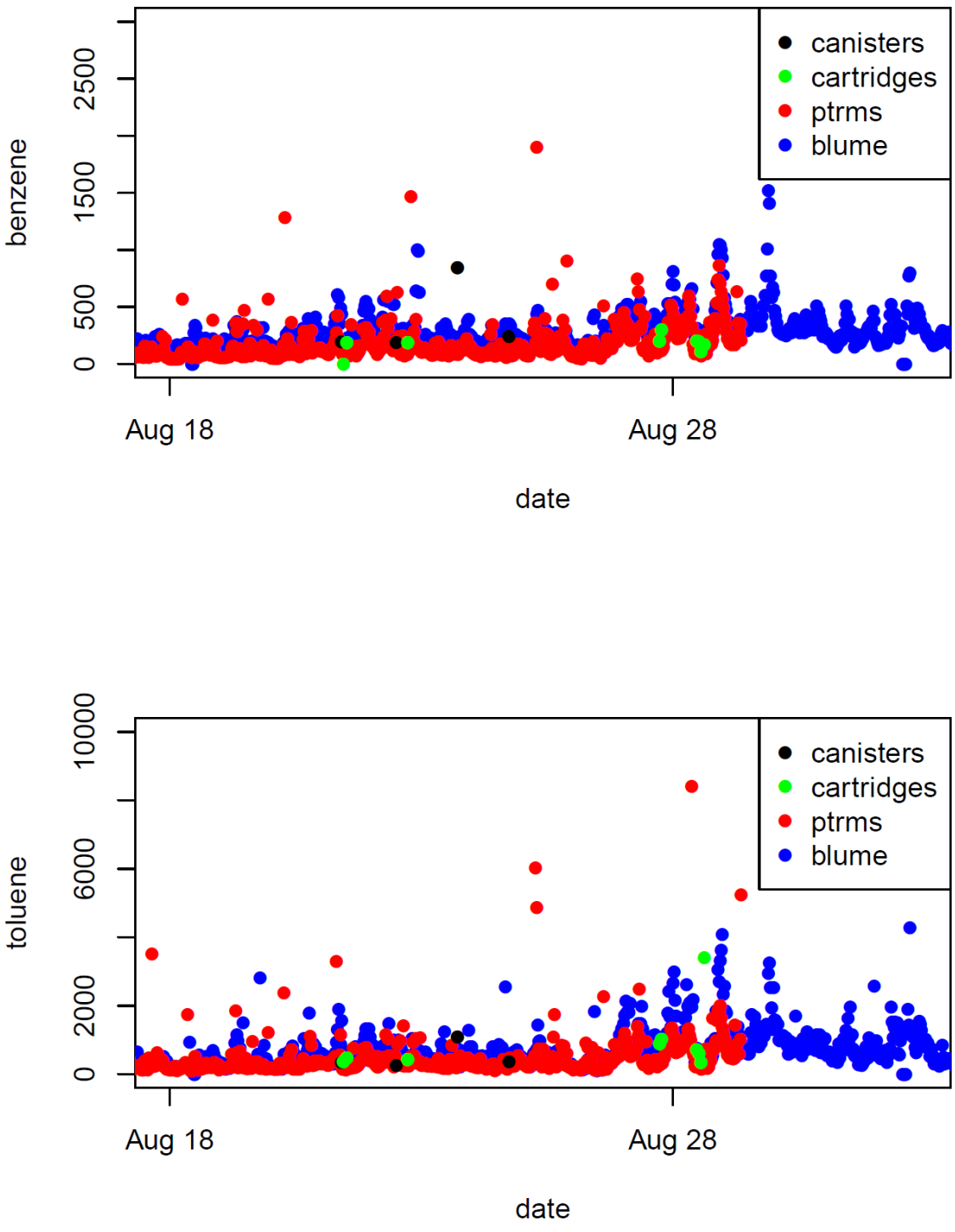


Figure S2. Mixing ratios measured for benzene (top) and toluene (bottom) by the individual cartridge and canister samples, and the continuous PTR-MS and BLUME network. Units are pptv.

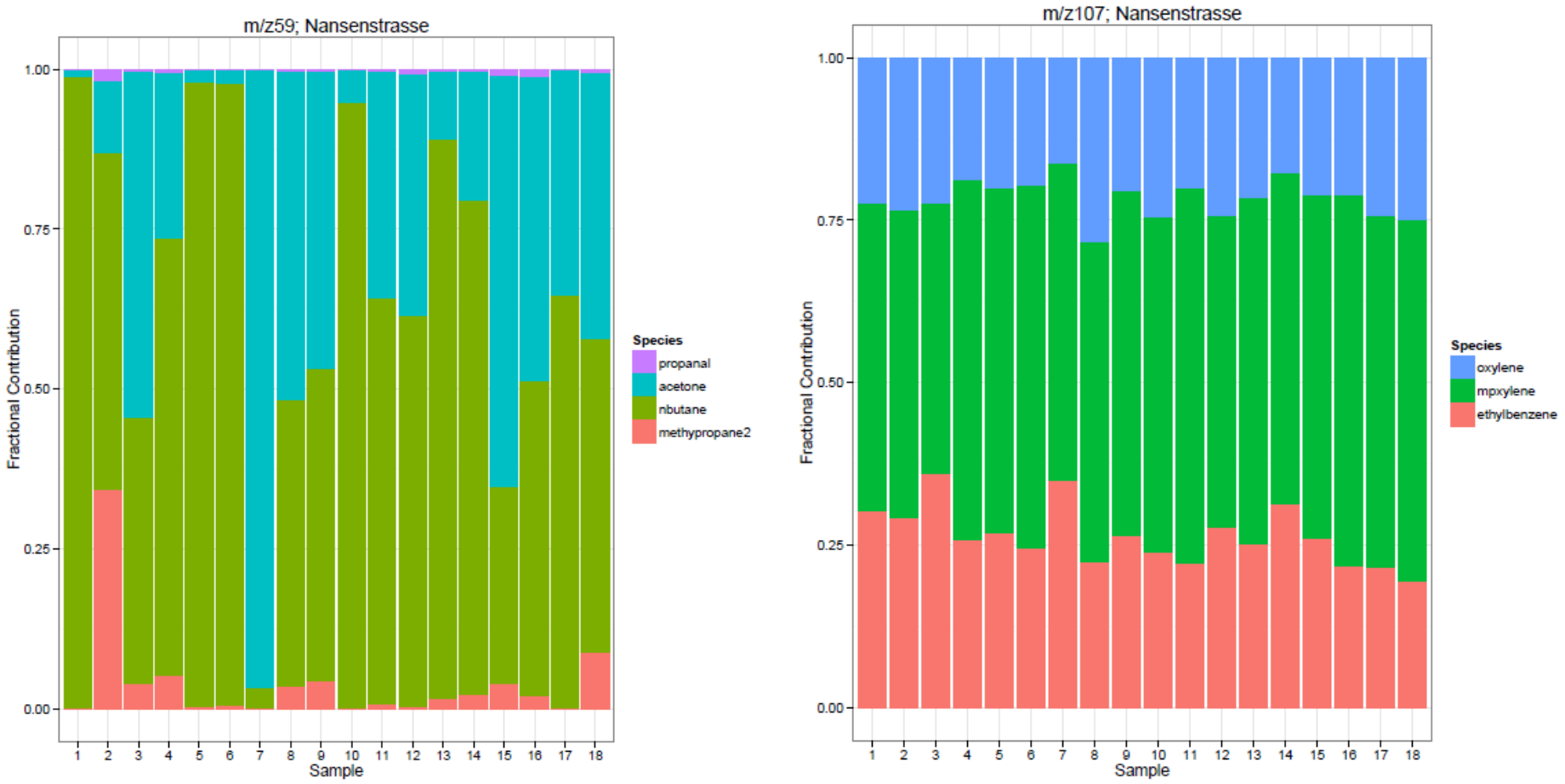
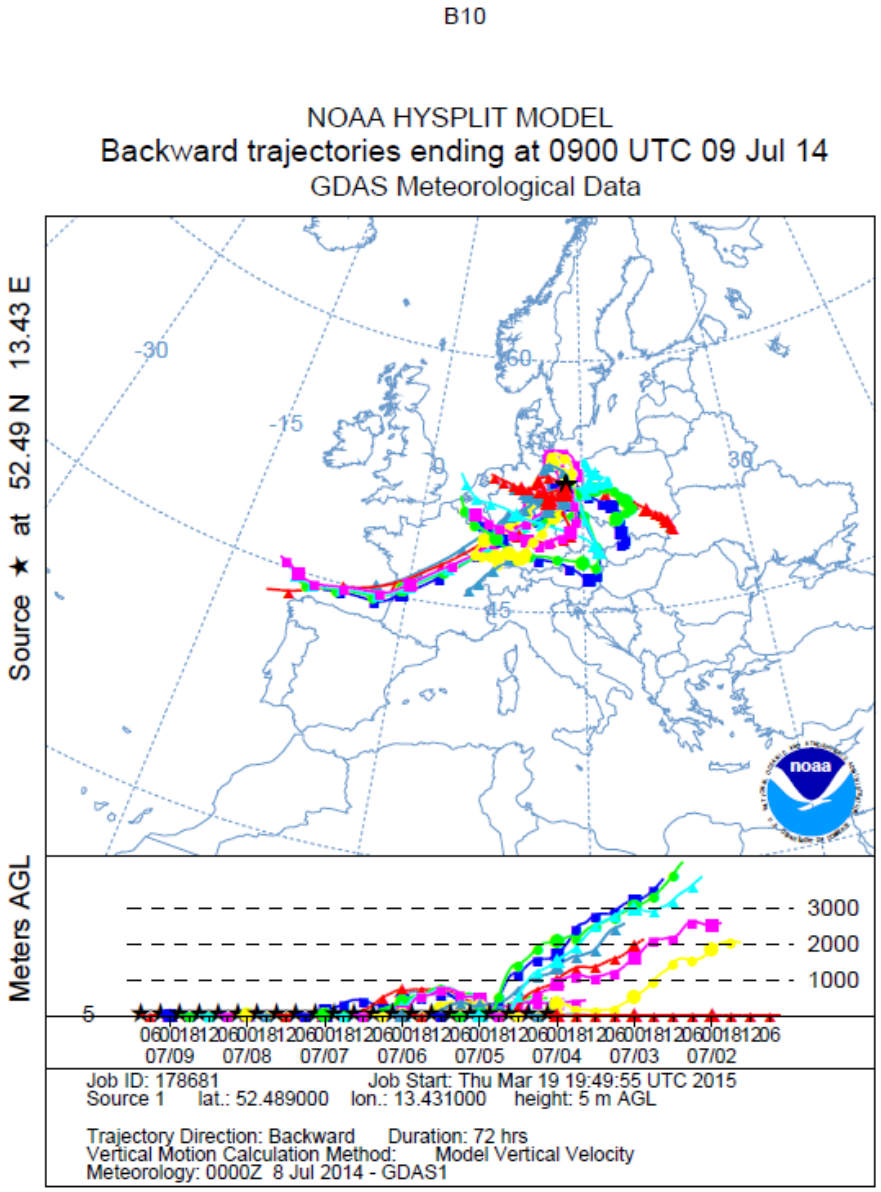
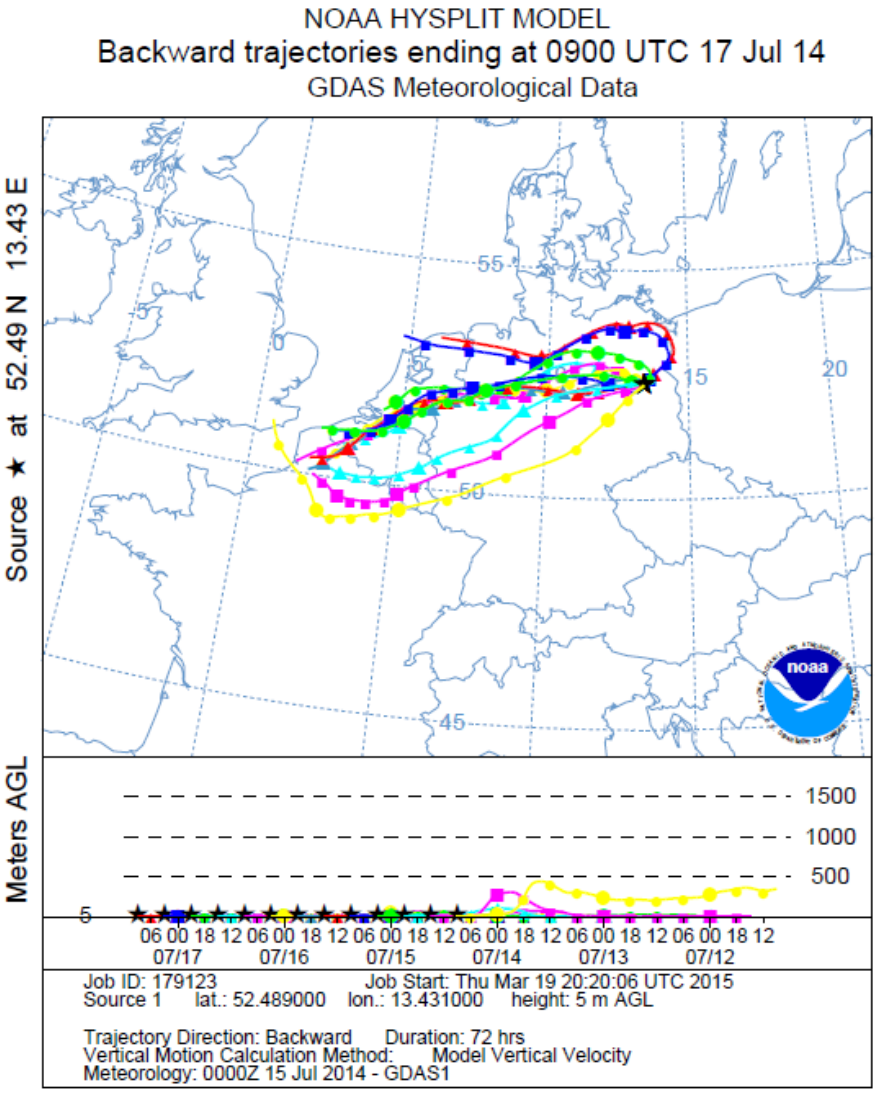


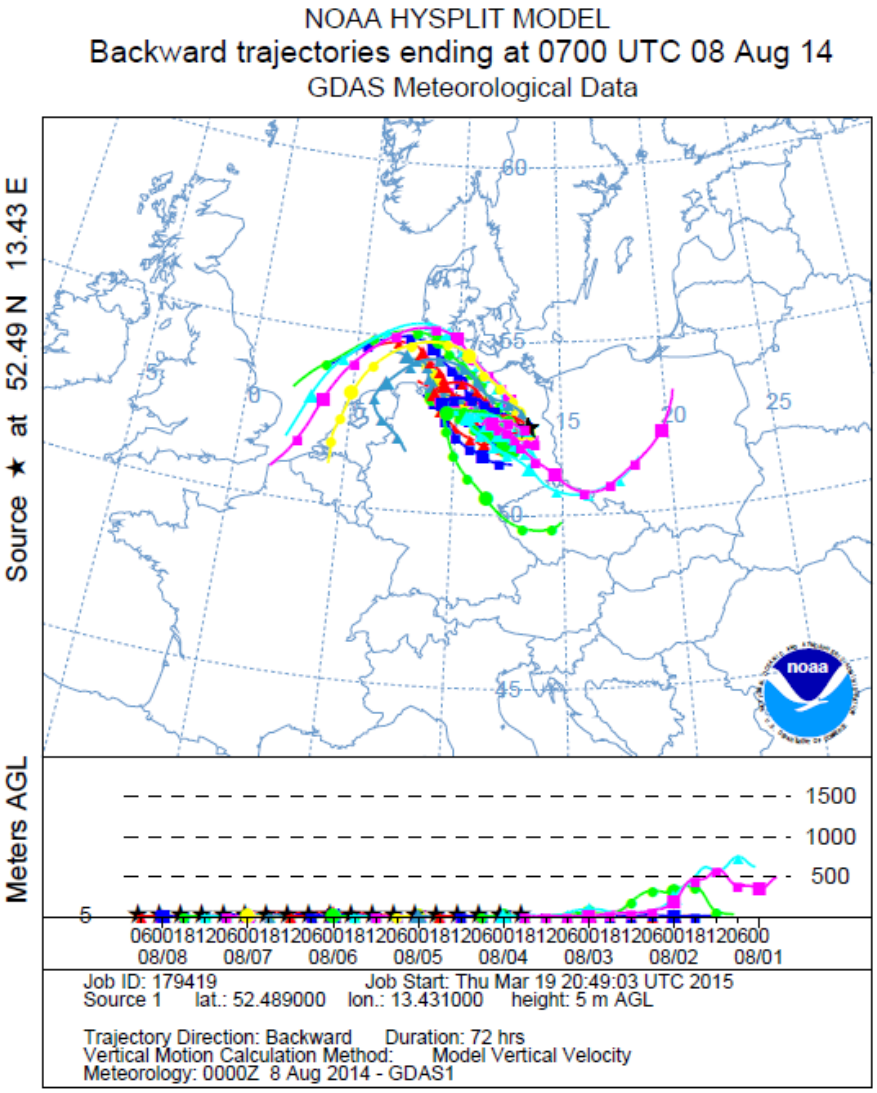
Figure S3. Fractional contribution of the individual NMVOCs measured by canister sample (GC-MS) to m/z 59 (left) and m/z 107 (right) for the 18 individual samples taken in Neukölln during the campaign.

Figure S4. Back trajectories calculated by filter, organized by filter group.

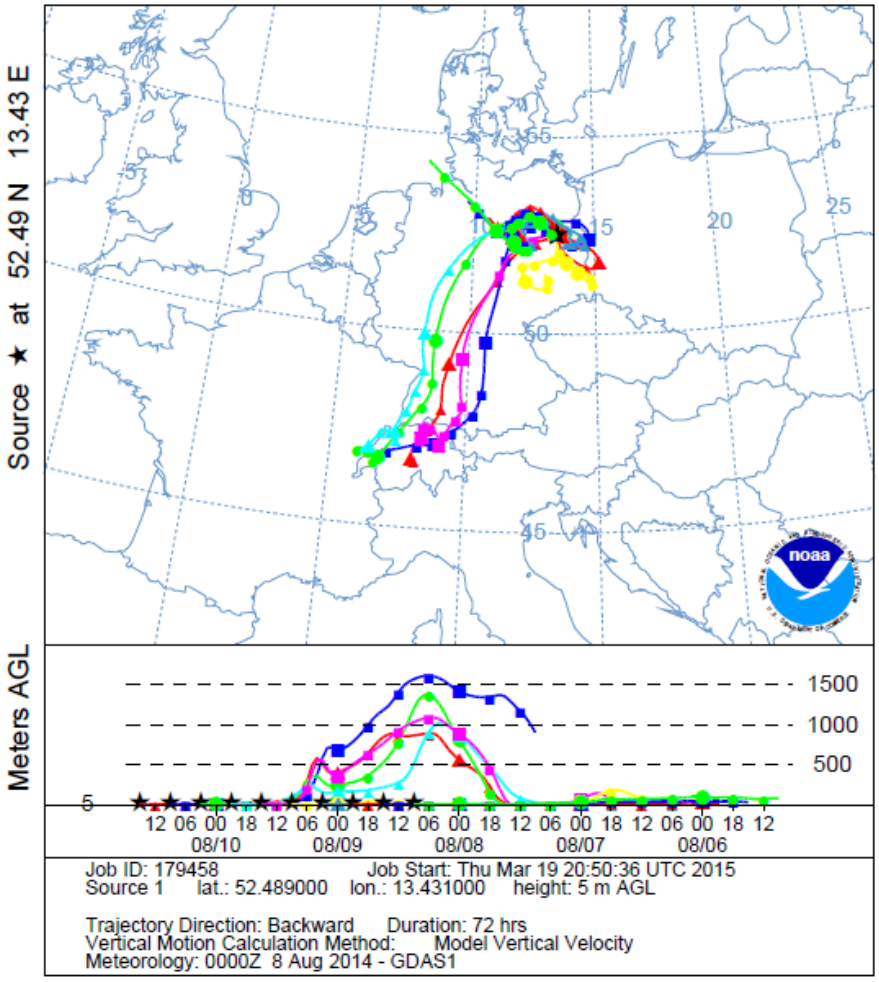
(a) **Group A**



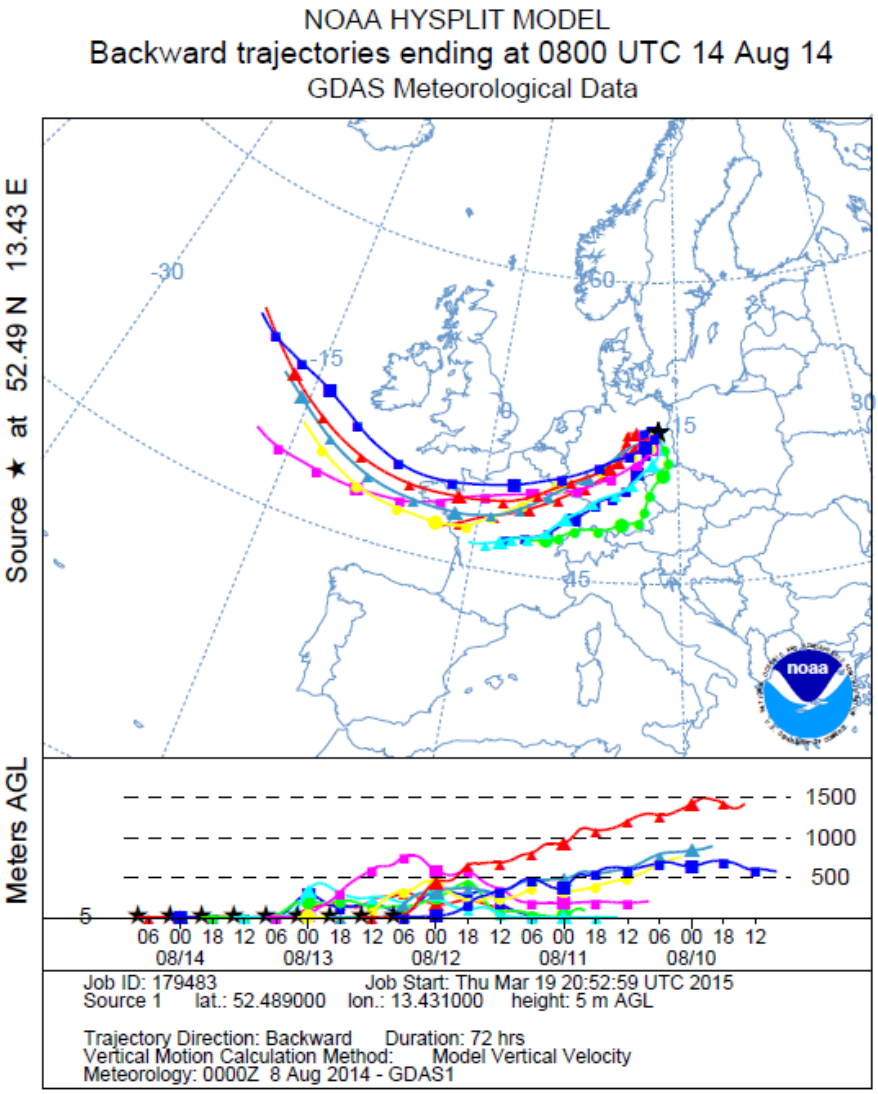

NOAA HYSPLIT MODEL
Backward trajectories ending at 0900 UTC 17 Jul 14
GDAS Meteorological Data
Source ★ at 52.49 N 13.43 E
55
50
45
15
20
noaa
Meters AGL
1500
1000
500
5
06 00 18 12 06 00 18 12 06 00 18 12 06 00 18 12 06 00 18 12 06 00 18 12
07/17 07/16 07/15 07/14 07/13 07/12
Job ID: 179123 Job Start: Thu Mar 19 20:20:06 UTC 2015
Source 1 lat.: 52.489000 lon.: 13.431000 height: 5 m AGL
Trajectory Direction: Backward Duration: 72 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 15 Jul 2014 - GDAS1


NOAA HYSPLIT MODEL
Backward trajectories ending at 0700 UTC 08 Aug 14
GDAS Meteorological Data
Source ★ at 52.49 N 13.43 E
60
55
50
45
0
5
15
20
25
noaa
Meters AGL
1500
1000
500
5
06001812060018120600181206001812060018120600181206001812060018120600
08/08 08/07 08/06 08/05 08/04 08/03 08/02 08/01
Job ID: 179419 Job Start: Thu Mar 19 20:49:03 UTC 2015
Source 1 lat.: 52.489000 lon.: 13.431000 height: 5 m AGL
Trajectory Direction: Backward Duration: 72 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 8 Aug 2014 - GDAS1

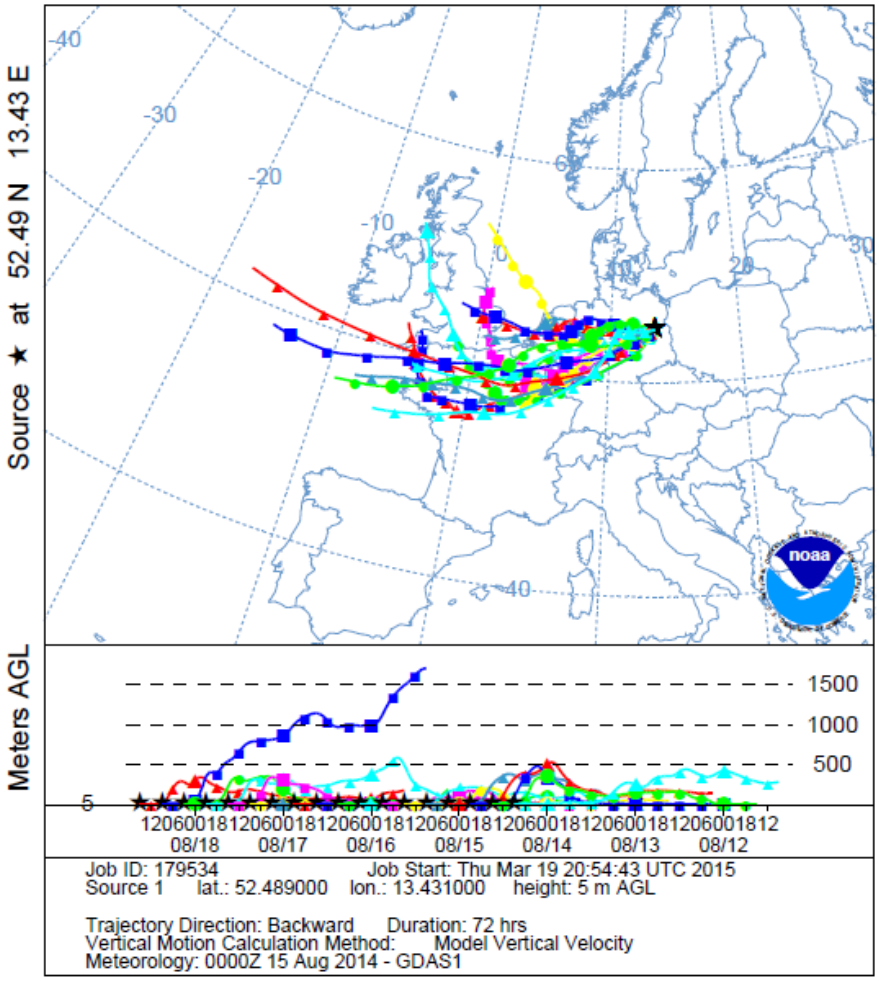
NOAA HYSPLIT MODEL
Backward trajectories ending at 1500 UTC 10 Aug 14
GDAS Meteorological Data



(b) Group B

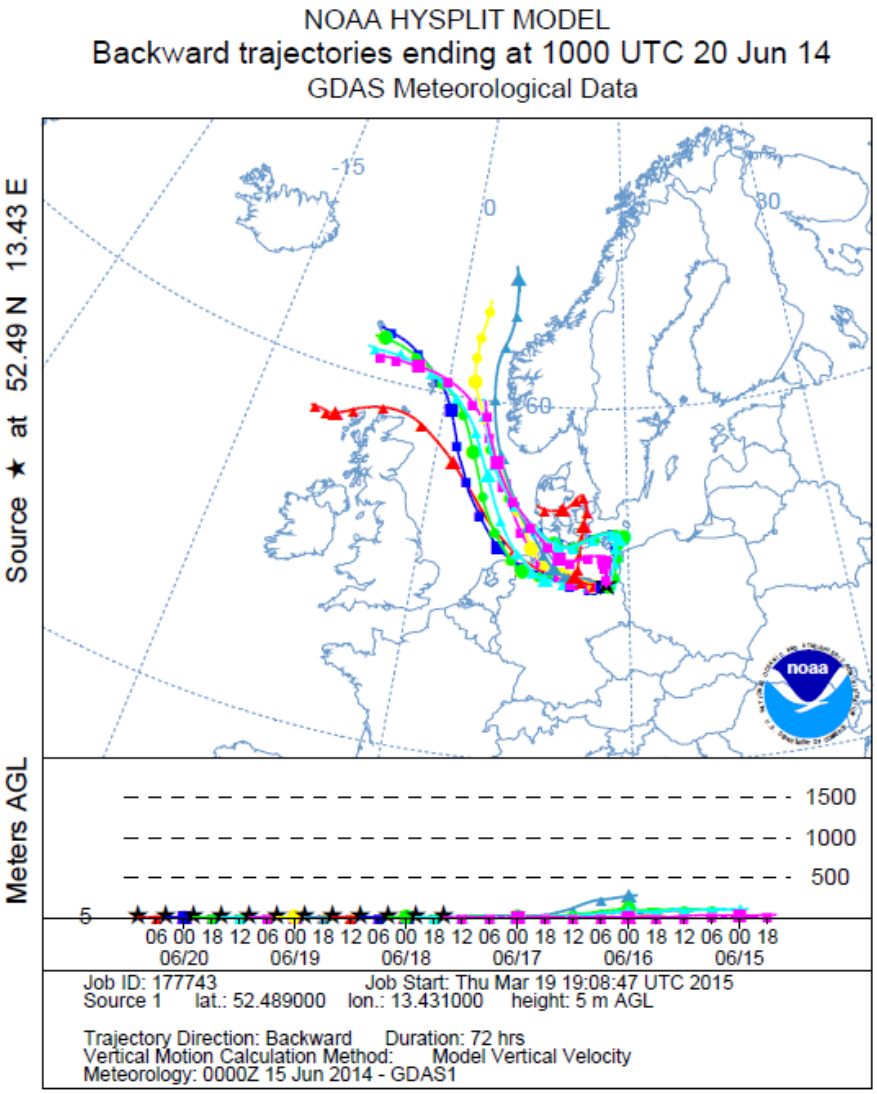

NOAA HYSPLIT MODEL
Backward trajectories ending at 0800 UTC 14 Aug 14
GDAS Meteorological Data
Source ★ at 52.49 N 13.43 E
Meters AGL
1500
1000
500
5
06 00 18 12 06 00 18 12 06 00 18 12 06 00 18 12 06 00 18 12
08/14 08/13 08/12 08/11 08/10
Job ID: 179483 Job Start: Thu Mar 19 20:52:59 UTC 2015
Source 1 lat.: 52.489000 lon.: 13.431000 height: 5 m AGL
Trajectory Direction: Backward Duration: 72 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 8 Aug 2014 - GDAS1

NOAA HYSPLIT MODEL
Backward trajectories ending at 1500 UTC 18 Aug 14
GDAS Meteorological Data

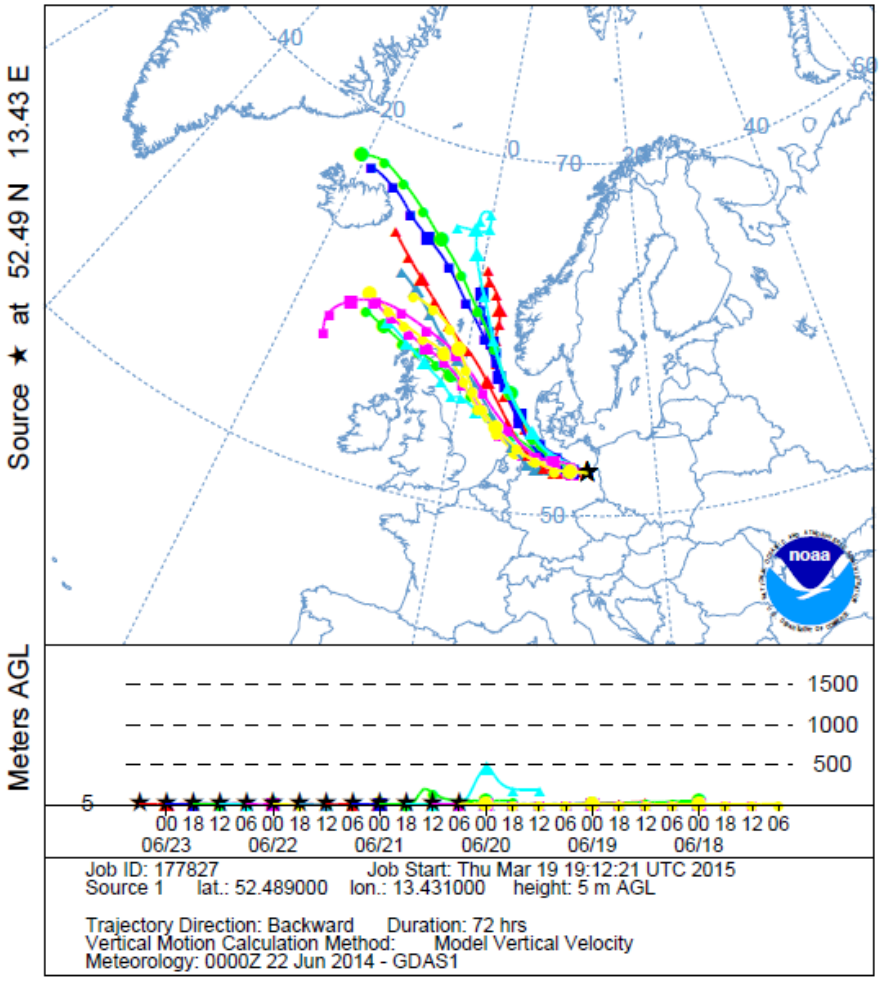


(c) Group C

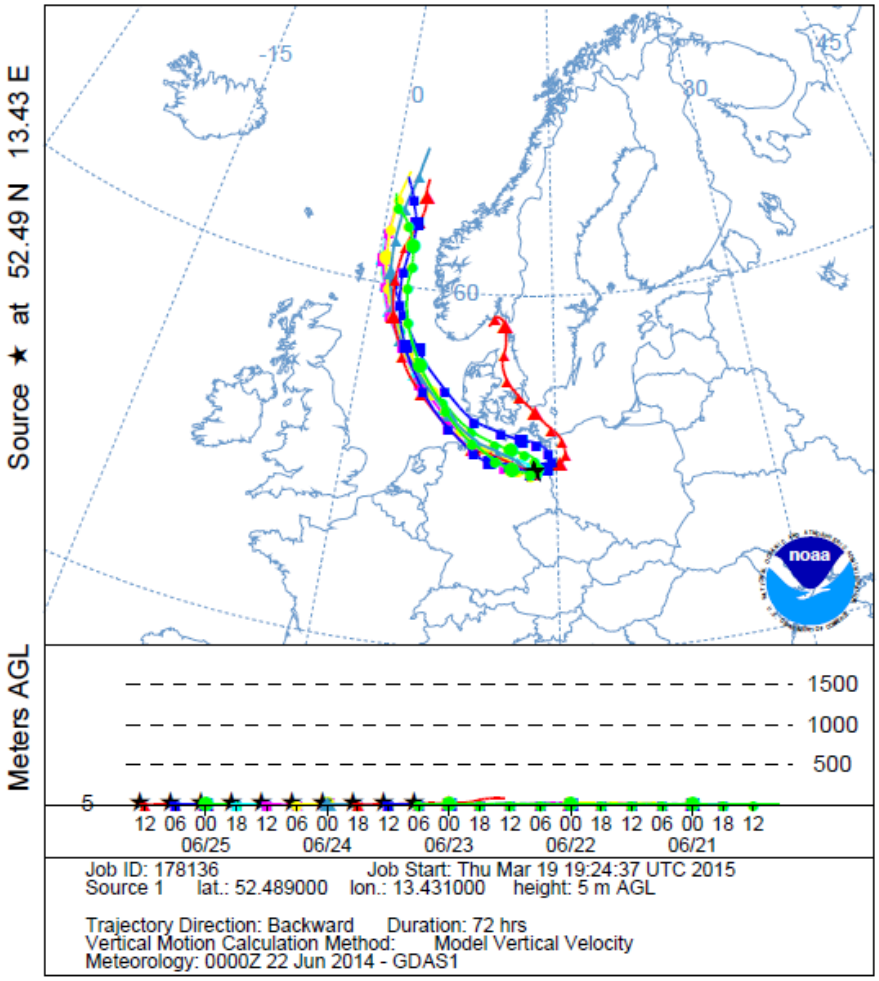
B4


NOAA HYSPLIT MODEL
Backward trajectories ending at 1000 UTC 20 Jun 14
GDAS Meteorological Data
Source ★ at 52.49 N 13.43 E
-15
0
30
60
noaa
Meters AGL
1500
1000
500
5
06 00 18 12 06 00 18 12 06 00 18 12 06 00 18 12 06 00 18 12 06 00 18
06/20 06/19 06/18 06/17 06/16 06/15
Job ID: 177743 Job Start: Thu Mar 19 19:08:47 UTC 2015
Source 1 lat.: 52.489000 lon.: 13.431000 height: 5 m AGL
Trajectory Direction: Backward Duration: 72 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 15 Jun 2014 - GDAS1

NOAA HYSPLIT MODEL
Backward trajectories ending at 0600 UTC 23 Jun 14
GDAS Meteorological Data



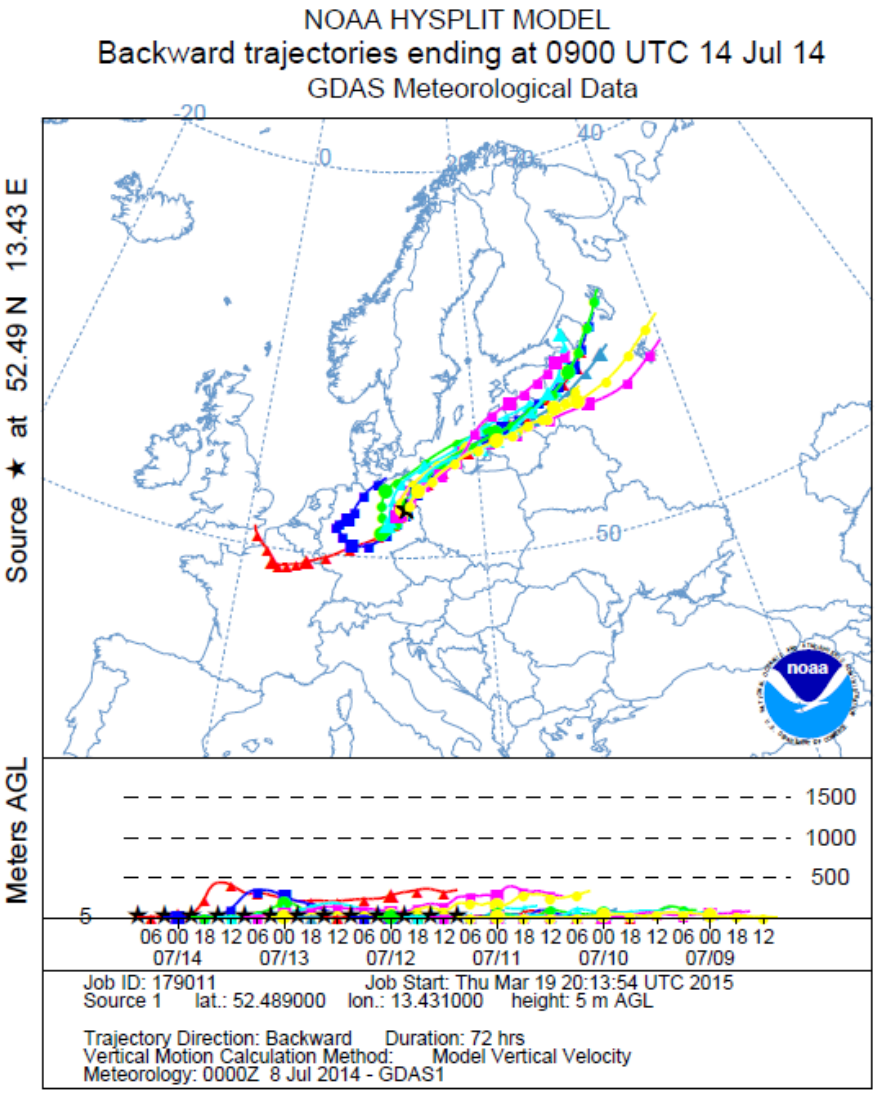
NOAA HYSPLIT MODEL
Backward trajectories ending at 1300 UTC 25 Jun 14
GDAS Meteorological Data



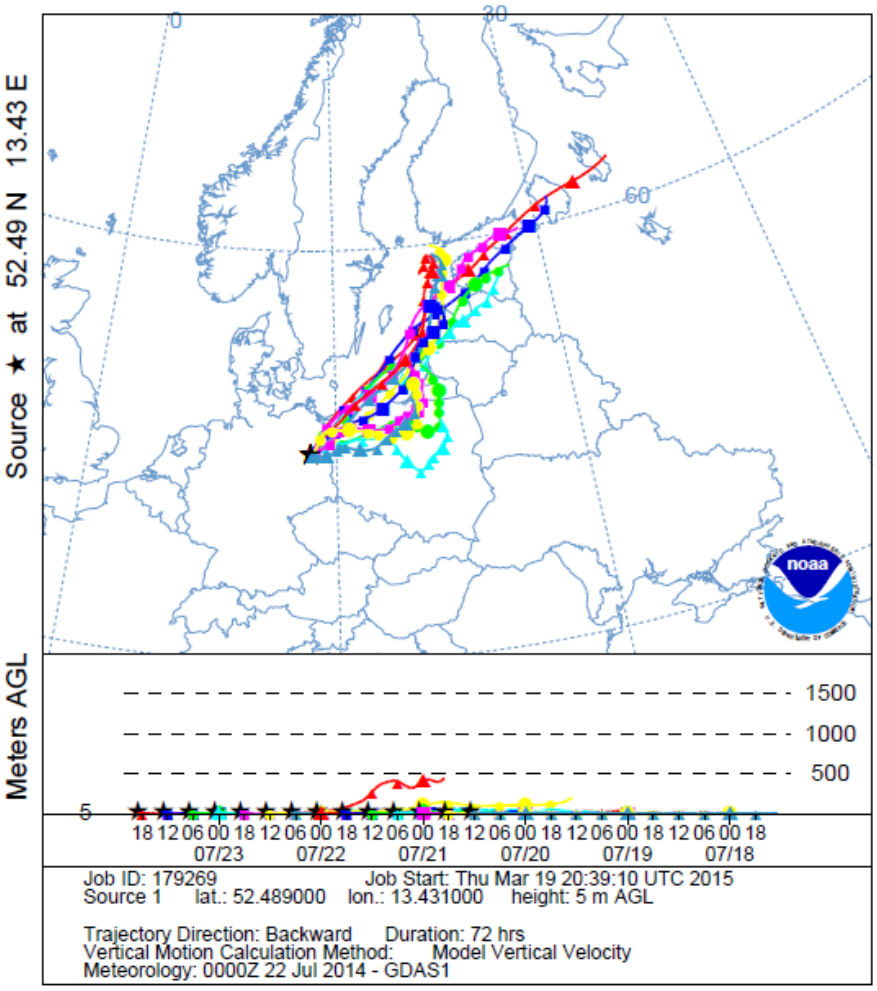
Job ID: 178136 Job Start: Thu Mar 19 19:24:37 UTC 2015
Source 1 lat.: 52.489000 lon.: 13.431000 height: 5 m AGL

Trajectory Direction: Backward Duration: 72 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 22 Jun 2014 - GDAS1

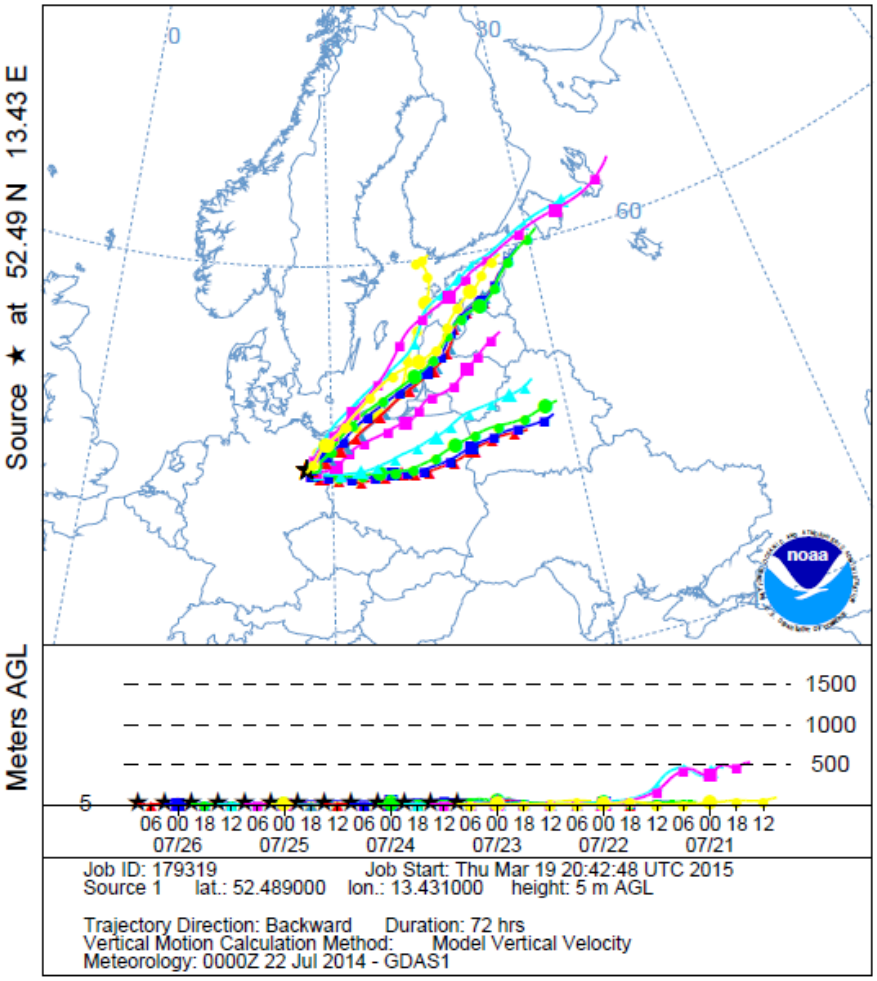
(d) Group D


NOAA HYSPLIT MODEL
Backward trajectories ending at 0900 UTC 14 Jul 14
GDAS Meteorological Data
Source ★ at 52.49 N 13.43 E
Meters AGL
1500
1000
500
5
06 00 18 12 06 00 18 12 06 00 18 12 06 00 18 12 06 00 18 12 06 00 18 12
07/14 07/13 07/12 07/11 07/10 07/09
Job ID: 179011 Job Start: Thu Mar 19 20:13:54 UTC 2015
Source 1 lat.: 52.489000 lon.: 13.431000 height: 5 m AGL
Trajectory Direction: Backward Duration: 72 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 8 Jul 2014 - GDAS1

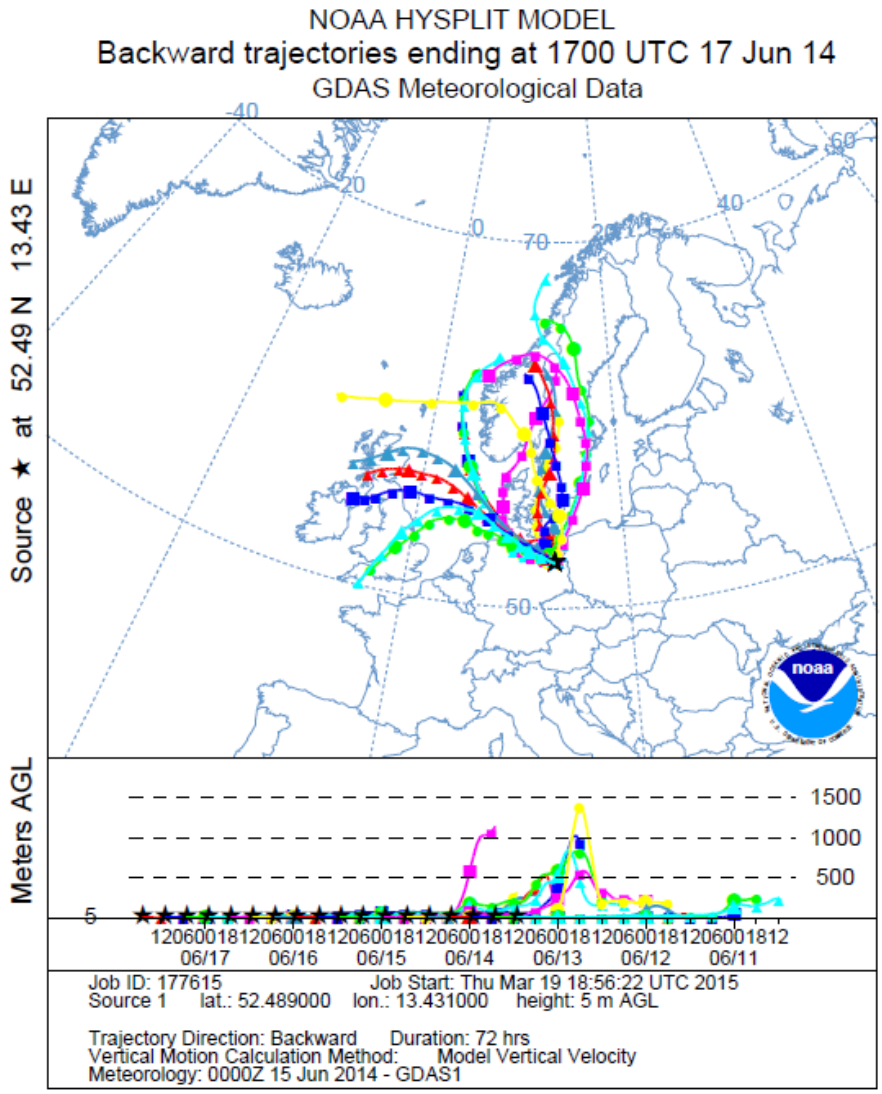
NOAA HYSPLIT MODEL
Backward trajectories ending at 1900 UTC 23 Jul 14
GDAS Meteorological Data



NOAA HYSPLIT MODEL
Backward trajectories ending at 0900 UTC 26 Jul 14
GDAS Meteorological Data



(e) Group E


NOAA HYSPLIT MODEL
Backward trajectories ending at 1700 UTC 17 Jun 14
GDAS Meteorological Data
Source ★ at 52.49 N 13.43 E
Meters AGL
1500
1000
500
5
120600181206001812060018120600181206001812060018120600181206001812
06/17 06/16 06/15 06/14 06/13 06/12 06/11
Job ID: 177615 Job Start: Thu Mar 19 18:56:22 UTC 2015
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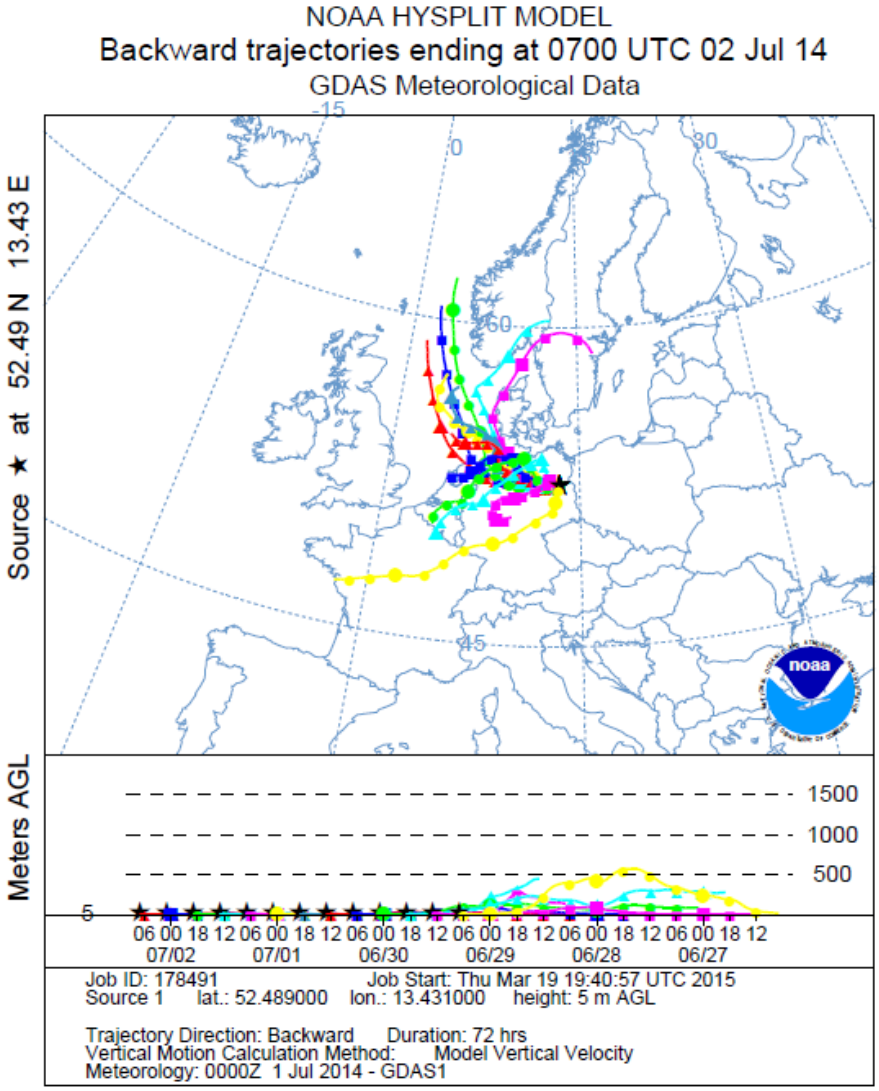
Trajectory Direction: Backward Duration: 72 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 15 Jun 2014 - GDAS1


NOAA HYSPLIT MODEL
Backward trajectories ending at 0700 UTC 02 Jul 14
GDAS Meteorological Data
Source ★ at 52.49 N 13.43 E
Meters AGL
1500
1000
500
5
06 00 18 12 06 00 18 12 06 00 18 12 06 00 18 12 06 00 18 12 06 00 18 12
07/02 07/01 06/30 06/29 06/28 06/27
Job ID: 178491 Job Start: Thu Mar 19 19:40:57 UTC 2015
Source 1 lat.: 52.489000 lon.: 13.431000 height: 5 m AGL
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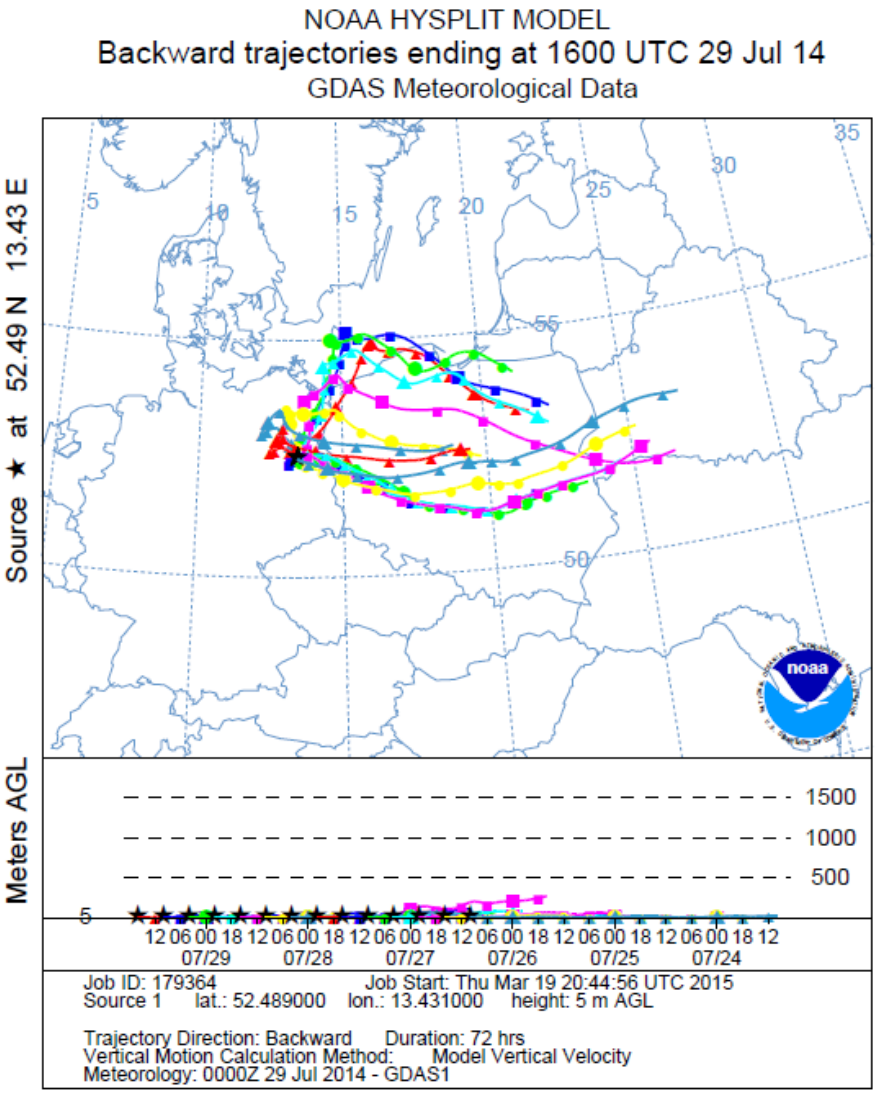
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 1 Jul 2014 - GDAS1

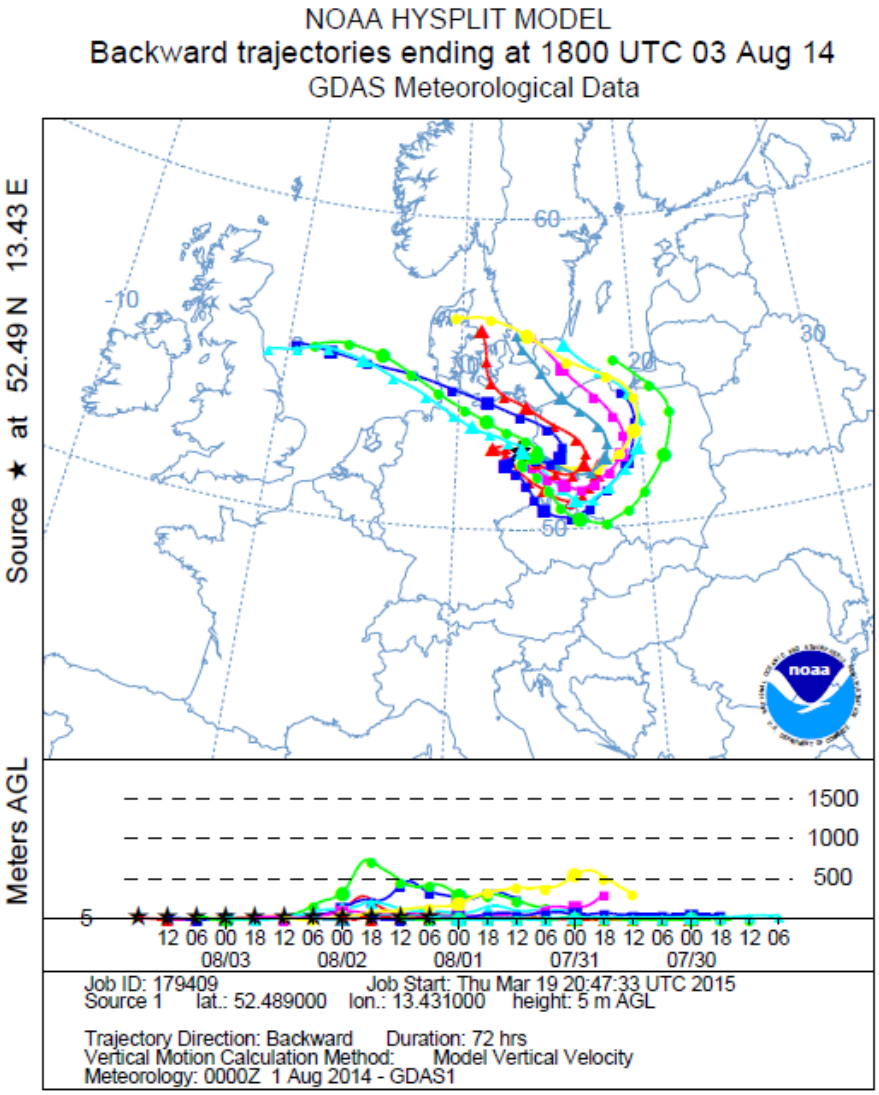
(f) Single filter B17

B17



(g) Single filter B19

B19



(h) Single filter B30

B30