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Supporting Material for the paper:

P-NEXFS Analysis of Aerosol Phosphorus Delivered to the Mediterranean Sea

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Supporting Methods

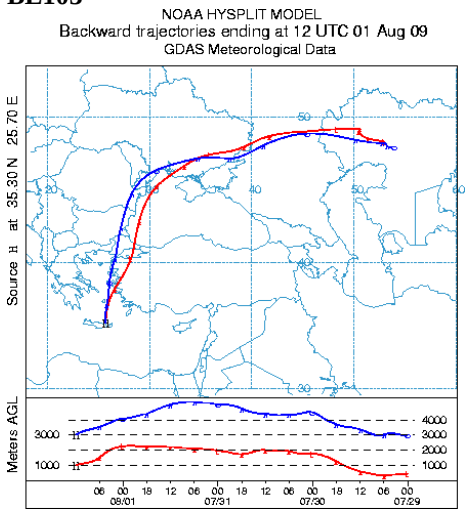
1.1 Organic phosphorus standards

Several organic phosphorus compounds were examined with P-NEXFS as standard material (Table S2). Samples were mounted onto cellulose acetate filters and prepared for analysis by cutting a 0.5 cm x 0.5 cm portion of filter and mounting the sample across a hole on an aluminum support stick. As shown in Figure S2, organic phosphorus compounds tended to have a relatively featureless post-edge. The lack of distinguishing characteristics does not allow for identification of a specific organic compound through P-NEXFS. Data for organic standards is available in External Database S1.

Table S1. Total and soluble phosphorus for PM10 samples collected at Finokalia research station

Sample ID	Collection Date	Loading ($\mu g/m^3$)	Soluble P ($nmol/m^3$)	Total P ($\mu mol/m^3$)	Air mass Origin
BL - 164	12/17/09	9.9	0.162	0.735	North Africa
BL - 188	2/18/10	100	0.304	3.090	North Africa
BL - 189	2/20/10	140	0.367	2.940	North Africa
BL - 228	5/15/10	82	0.454	2.089	North Africa
BL - 242	6/17/10	63	0.180	1.954	North Africa
BL - 339	1/29/11	57	0.204	1.518	North Africa
BL - 377	4/28/11	91	0.469	2.006	North Africa
BL - 380	5/5/11	77	0.395	2.499	North Africa
T-305	1/23/09	170	0.427	3.809	North Africa
BL - 154	11/24/09	20	0.105	0.227	Europe
BL - 103	8/1/09	23	0.228	0.395	Europe
BL - 104	8/3/09	24	0.132	0.230	Europe
BL - 279	9/19/10	27	0.273	0.776	Europe
BL - 303	11/6/10	22	0.266	0.365	Europe

BL103



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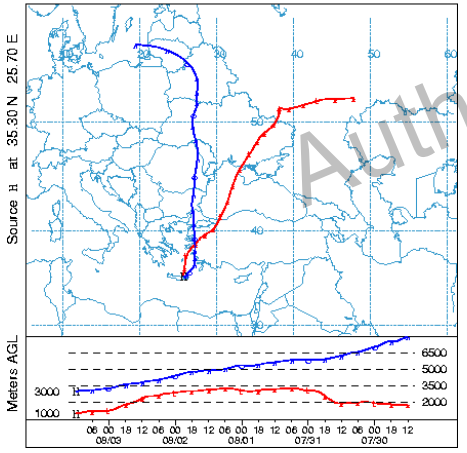

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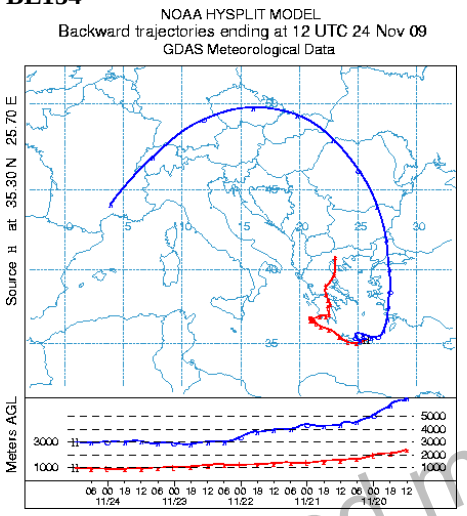

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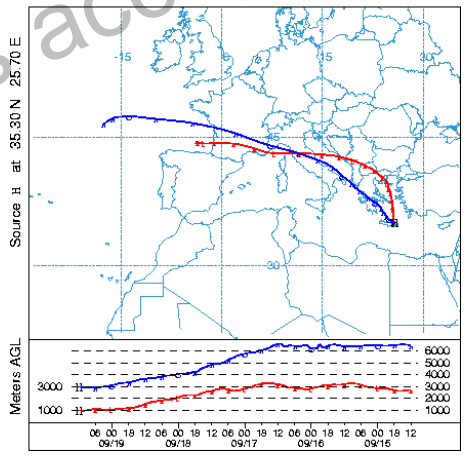

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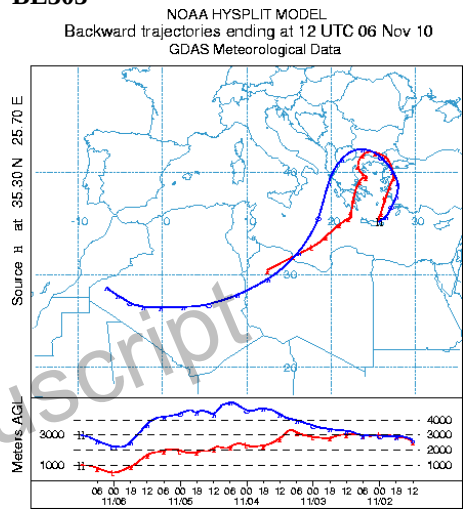

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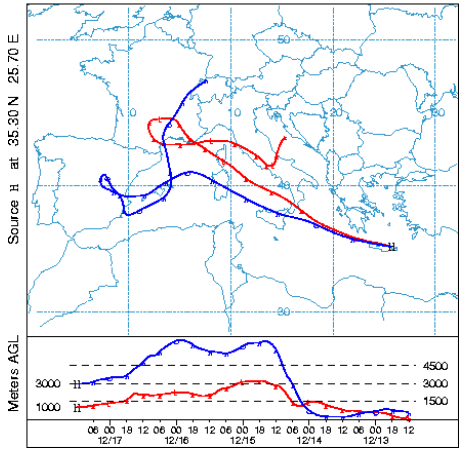

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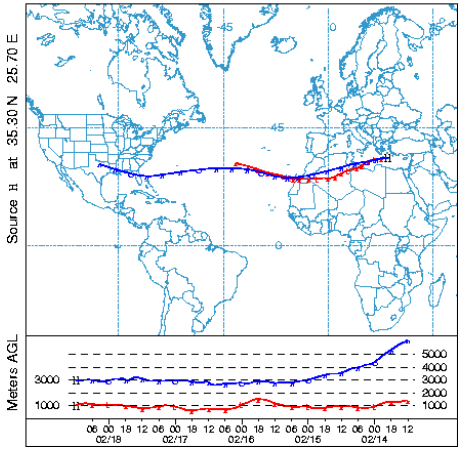

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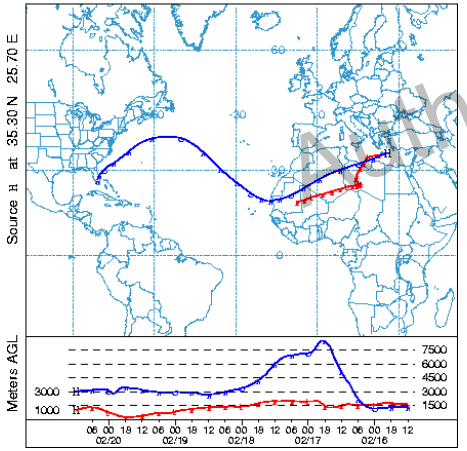

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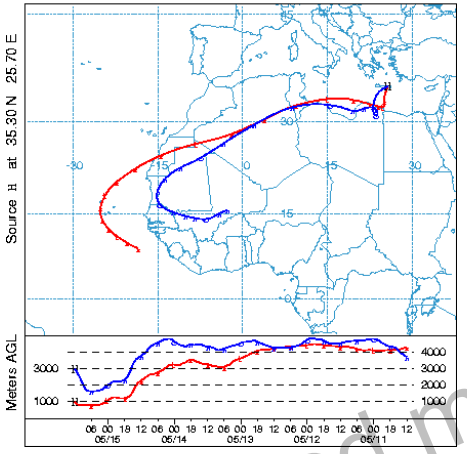

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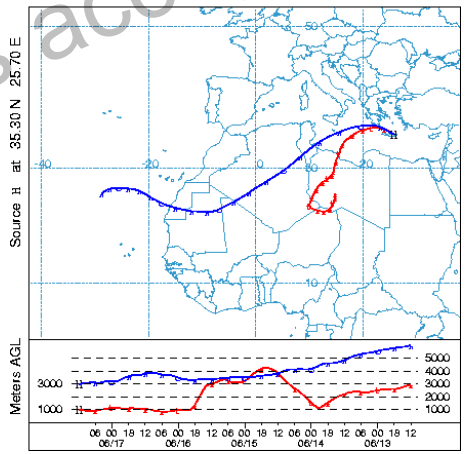

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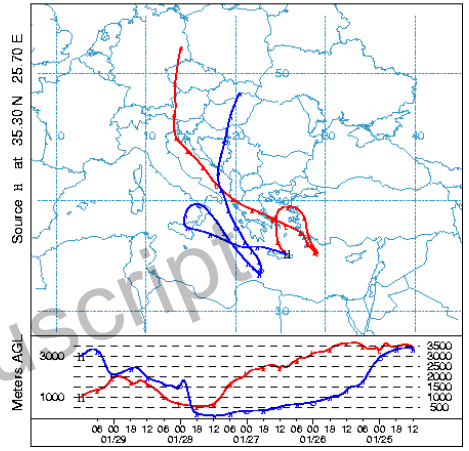

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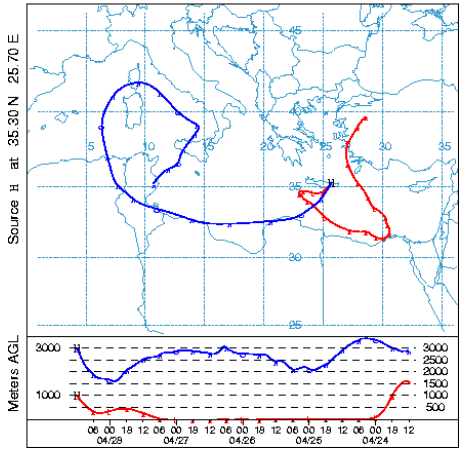

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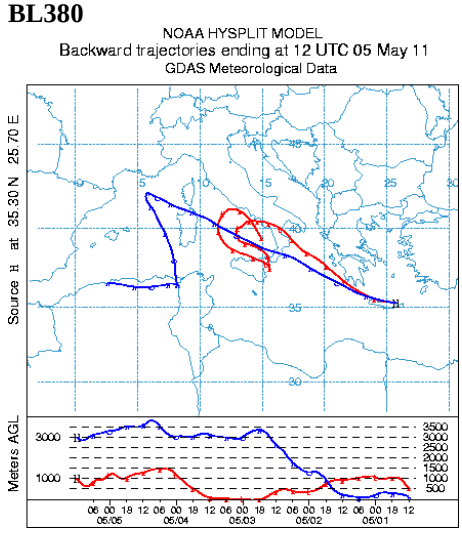

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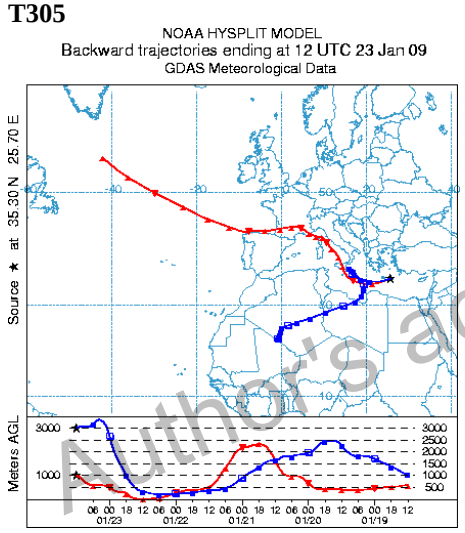

Figure S1. HYSPLIT back trajectories for air masses originating in Europe and North Africa.

Table S2. Organic P compounds and CAS numbers

Organic P compound	CAS
2-aminoethylphosphonic acid	2041-14-7
Ammonium OO-diethyldithiophosphate	1068-22-0
Adenosine-5'-triphosphate	51963-61-2
Glycerol Phosphate	55073-41-1
Hexametaphosphate	68915-31-1
Polyphosphate CL15	-
Sodium tripolyphosphate	7758-29-4
O-Phospho-L-Serine	407-41-0
O-Phosphorylethanolamine	1071-23-4
Phosphotidylcholine	97281-47-5
Phytic Acid	83-86-3

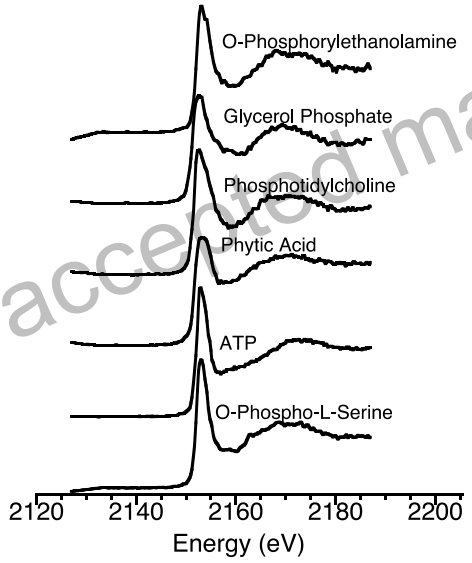

Figure S2. Spectra of several organic phosphorus standards. A variety of organic standards all have a sharp peak at 2152 eV, the P K-edge, and a relatively featureless post-edge. As is the case with some mineral groups, the presence of organic phosphorus compounds can be detected using spectroscopy, but more detailed chemical identifications are not possible in concentrations typical of natural samples.