



LABORATORY OF
ENVIRONMENTAL SUSTAINABILITY
DEPARTMENT OF CHEMISTRY
UNIVERSITY OF BARI «ALDO MORO»



Monitoraggio intensivo di Idrocarburi Policiclici Aromatici (IPA) nell'area industriale di Taranto

PM2014

Gianluigi de Gennaro; Alessia Di Gilio; Paolo Dambruoso; Pasquale Giungato;
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Laboratorio di Sostenibilità Ambientale



Dipartimento di Chimica dell'Università degli Studi di Bari "A. Moro"

ARPA PUGLIA – UOS Particolato Atmosferico ed Olfattometria

Reti di Laboratori Pubblici di Ricerca 'VOC & ODOR'



IDATI

Tra il 2008 e il 2009 l'Arpa ha rilevato diversi sforamenti del valore-limite e non solo al quartiere Tamburi

LA STRATEGIA

Il sindaco ha chiesto una relazione per poter poi attivare l'Agenzia regionale e scoprire l'origine delle emissioni

Sos benzoapirene «Intervenga Stefano»

Marescotti: risalire alla fonte e bloccare le emissioni

8

Le notizie di TarantoOggi

AMBIENTE

www.tarantooggi.it

Mercoledì 3 Ottobre 2012

PUBBLICATA RELAZIONE QUALITÀ ARIA 2011: DAL SIDERURGICO LIVELLI ELEVATI DI PM10 E BENZOAPIRENE

L'ARPA inchioda l'Ilva

6 Ambiente

Le notizie di TarantoOggi

Venerdì 30 Marzo 2012

www.tarantooggi.it

LE TAPPE DI UNA VICENDA TRISTEMENTE RIDICOLA

Benzo(a)pirene story

Presso gli uffici della Regione Puglia, si è svolto l'ennesimo tavolo tecnico sulla questione benzo(a)pirene. Al tavolo hanno preso parte i tre principali soggetti privati operanti sul territorio ionico (Ilva, Eni e Cementir), i quali hanno assunto il "rivoluzionario" impegno di presentare nel giro di un mese, una propria proposta per la riduzione delle emissioni, in relazione al numero carico nor-



ne di infiniti tavoli tecnici, nella speranza che a qualcuno prima o poi venga l'idea



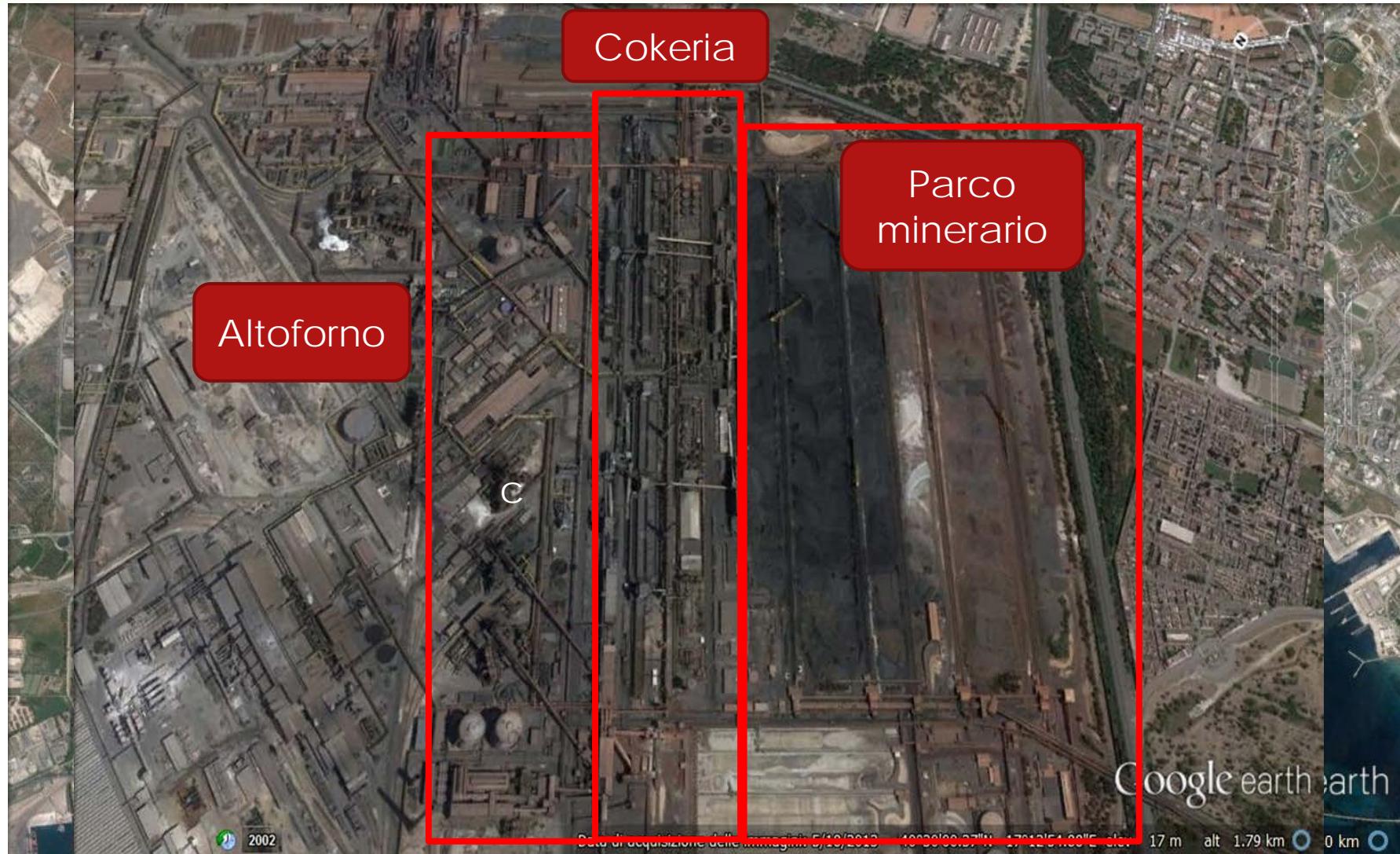
Alla Regione Puglia si è svolto l'ennesimo, inutile tavolo tecnico, per affrontare un problema "scoperto" soltanto nel 2010. Con Ilva, Eni e Cementir che hanno chiesto un mese di tempo per avanzare le loro proposte

luglio ci muovono a cauto ottimismo".

Ottimismo che è andato

smarrito dopo i dati marzo.

ebbe origine la "questione benzo(a)pirene". Dobbiamo infatti tornare indietro sino al 4 ottobre 2010 giorno in





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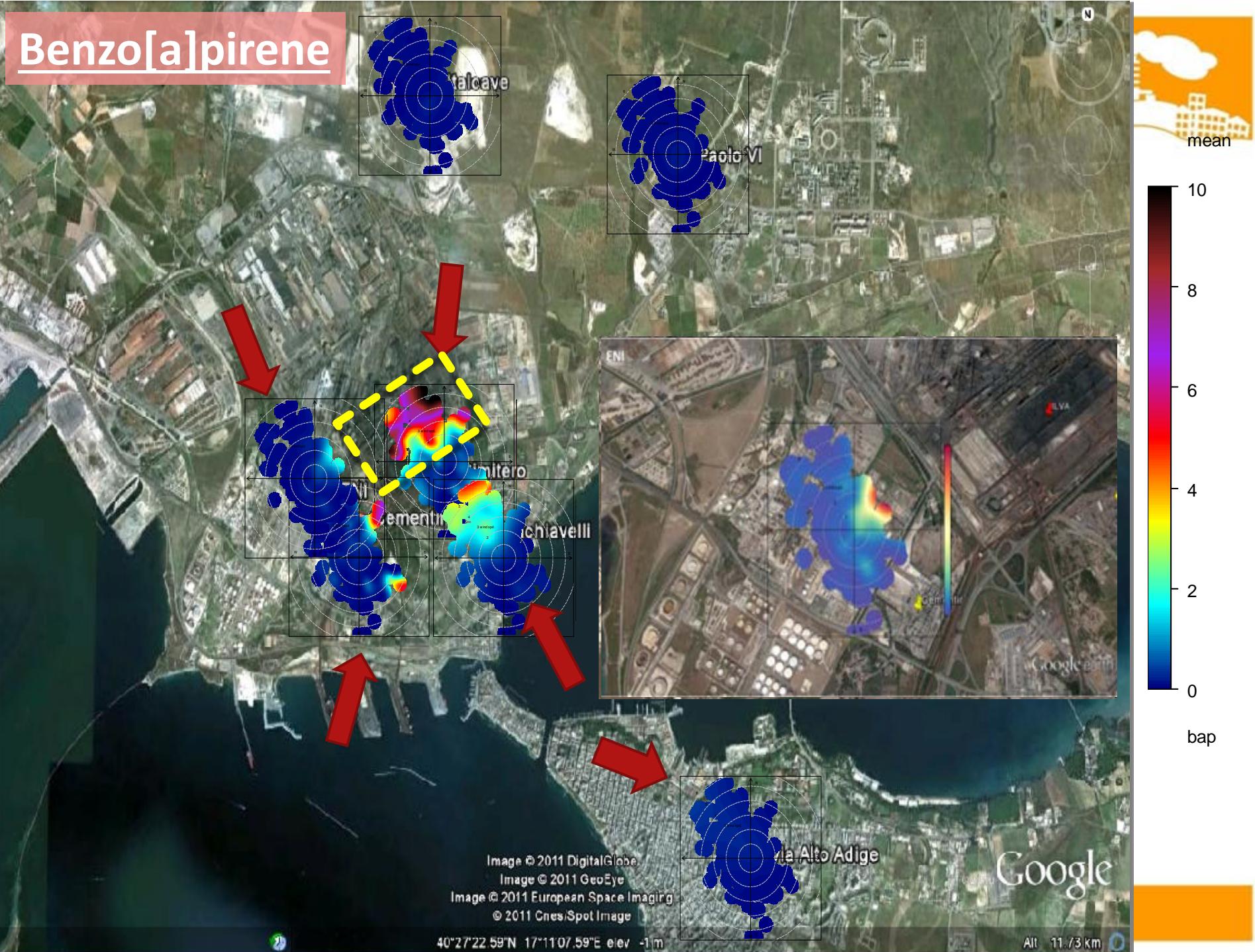
CAMPAGNA DI MONITORAGGIO

Campionamento e determinazione PM10 e PM 2.5
per 7 mesi su 7 siti (Gennaio – Luglio 2011)

2380 campioni



Benzo[a]pirene



BaP/BgP

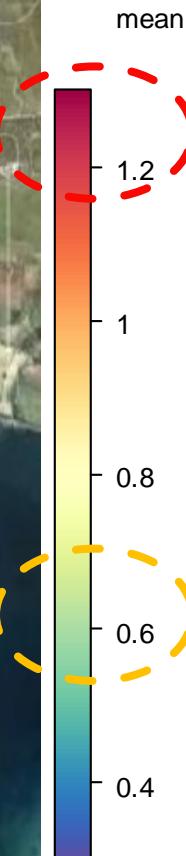
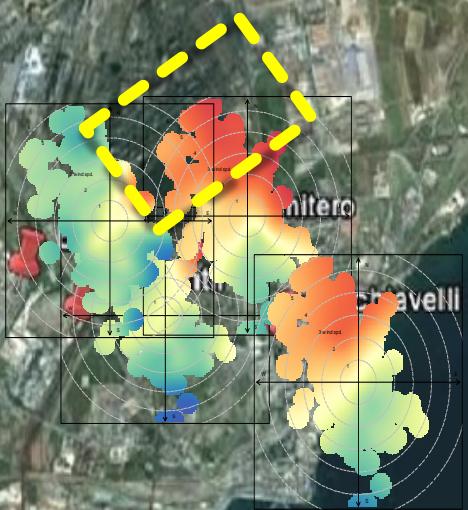


Image © 2011 DigitalGlobe
Image © 2011 GeoEye
Image © 2011 European Space Imaging
© 2011 Cnes Spot Image

Google

Benzene/Toluene

Italcave

BARI
Benzene/Toluene

mean

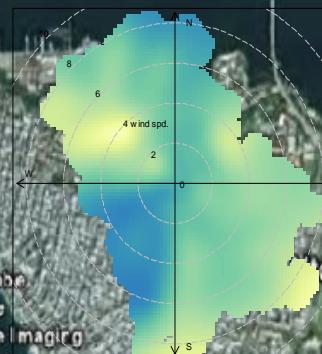
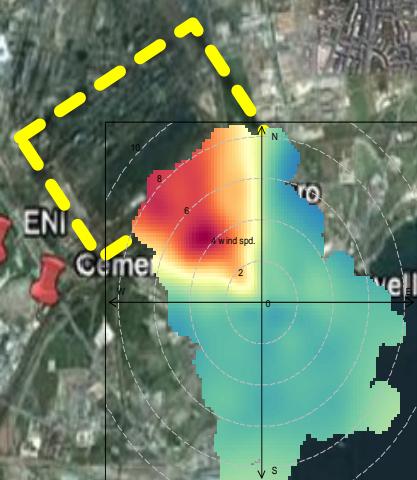
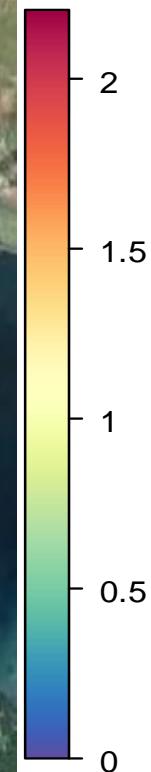
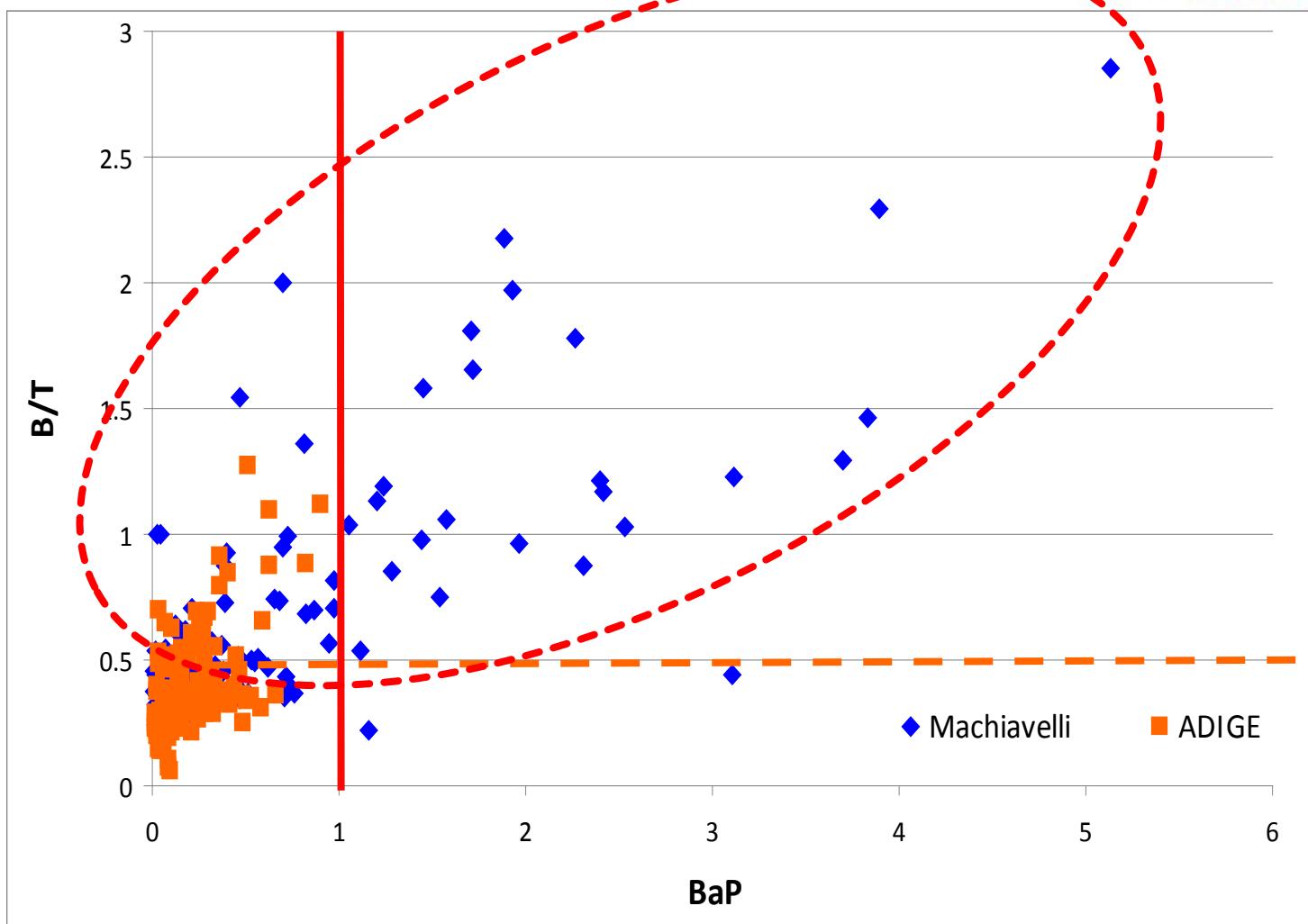
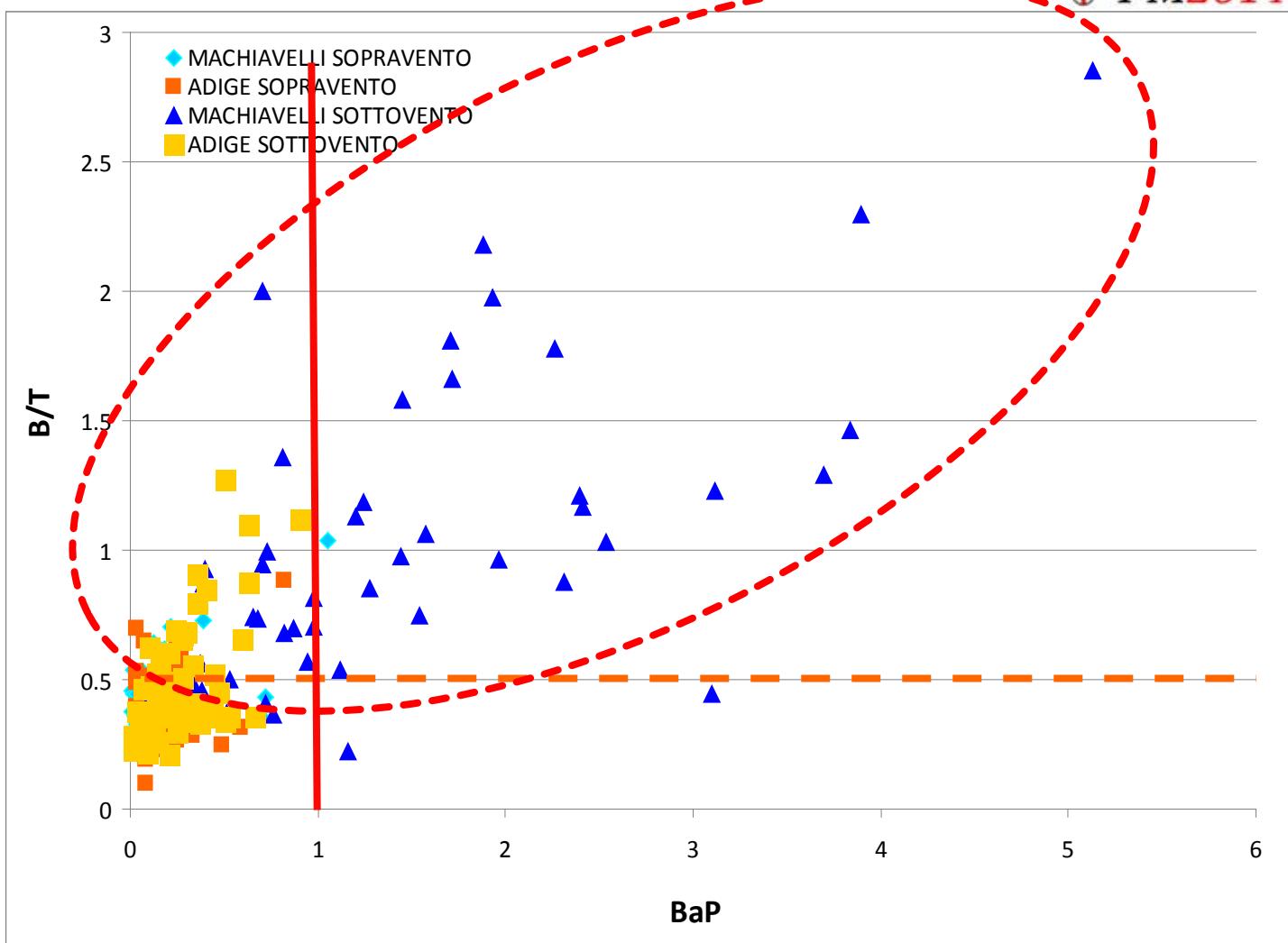


Image © 2011 DigitalGlobe
Image © 2011 GeoEye
Image © 2011 European Space Imaging
© 2011 Cnes/Spot Image

40°27'22.59"N 17°11'07.59"E elev -1 m

All 11.73 km

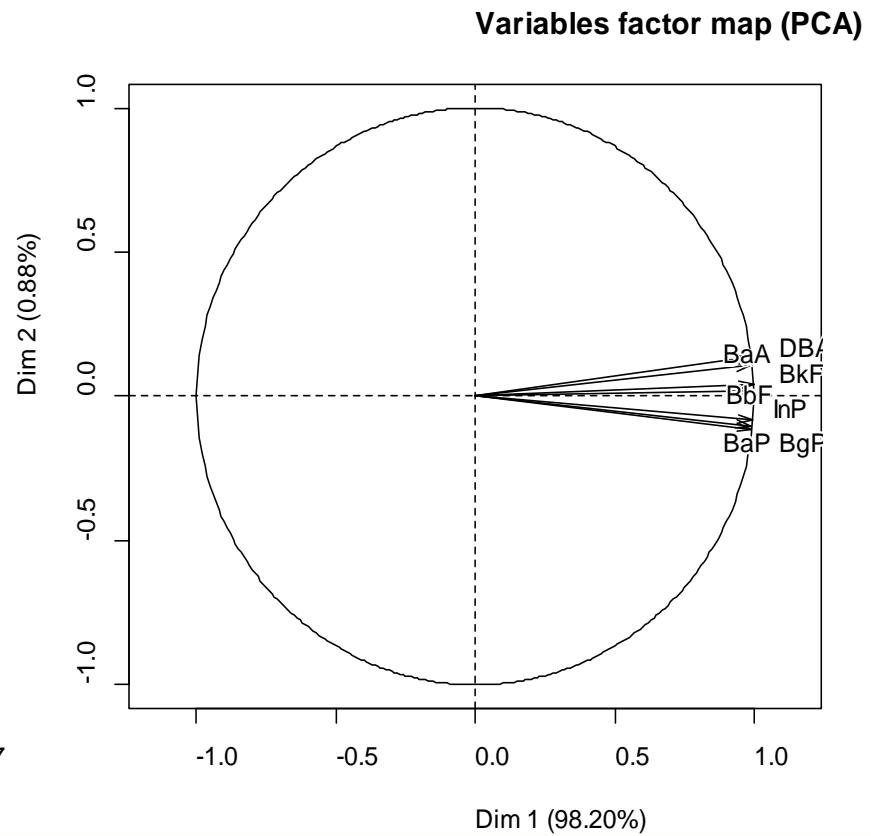
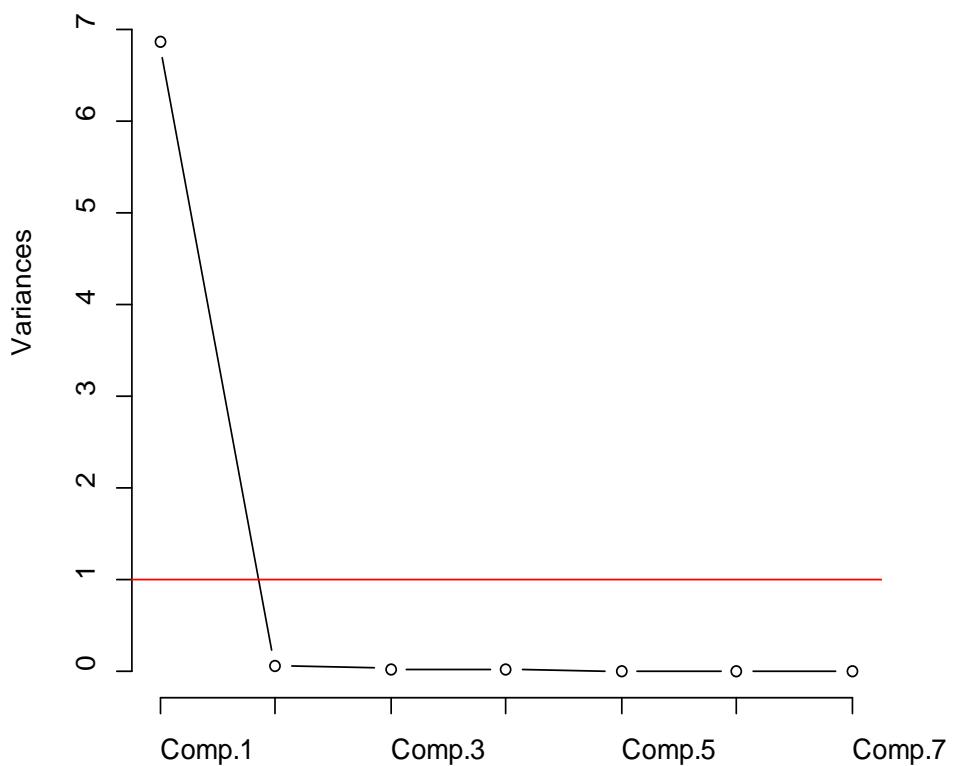






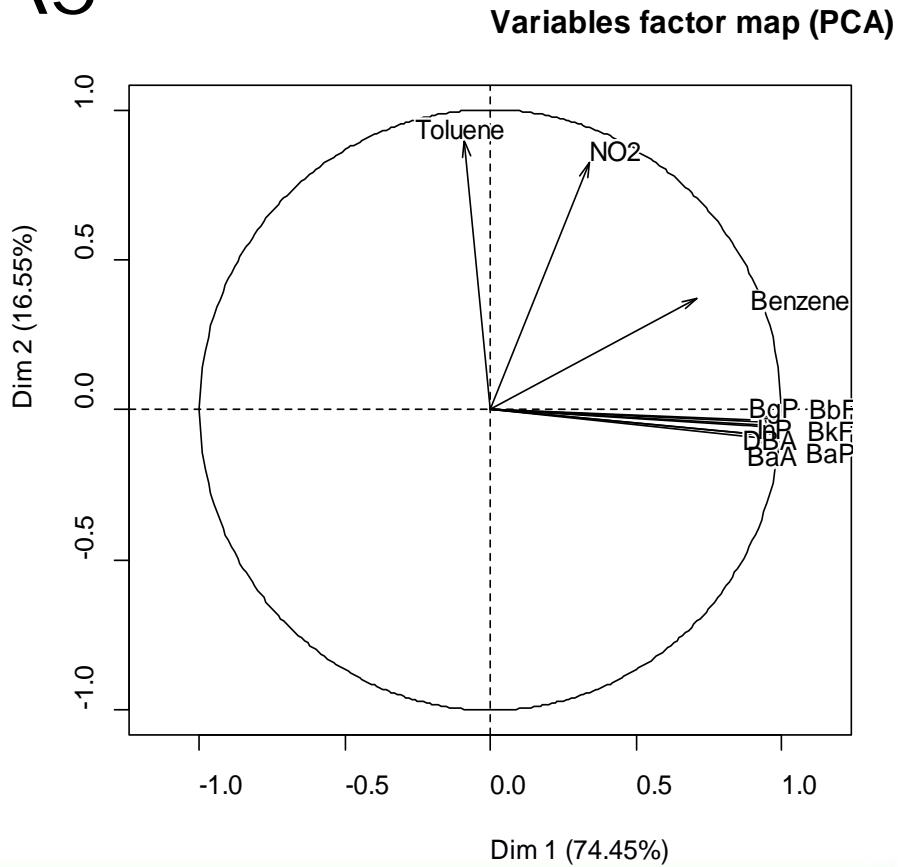
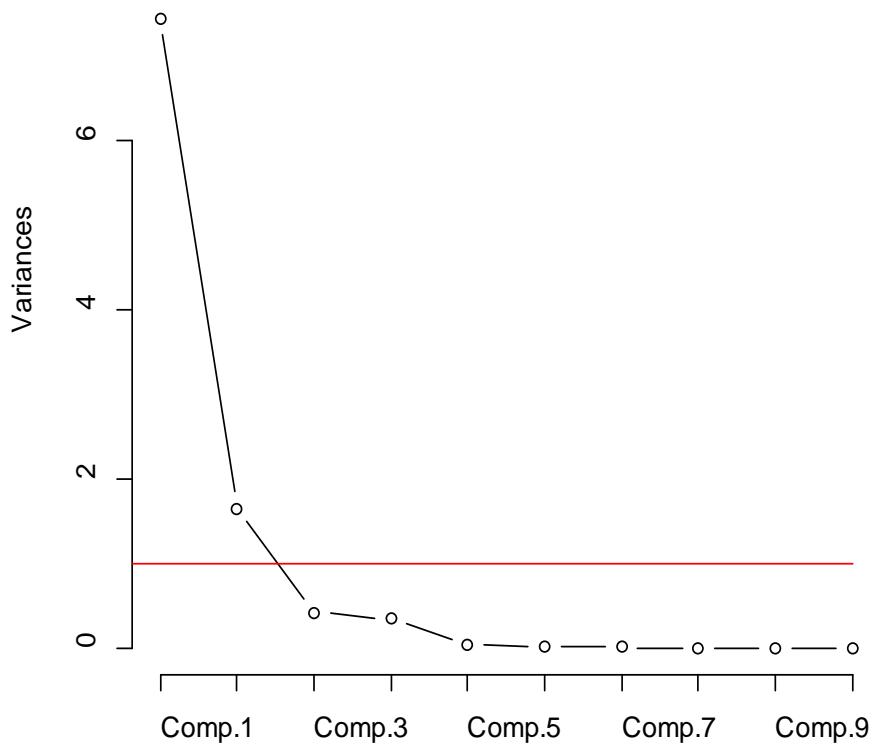
PCA ADIGE

fit





PCA ADIGE : fit IPA + GAS





Loading PCA ADIGE

IPA + GAS

Elemento	PC1 (industriale)	PC2 (Trafico)
BaA	0.98	-0.10
BbF	0.99	-0.03
BkF	0.99	-0.06
BaP	0.98	-0.08
InP	0.99	-0.05
DBA	0.97	-0.08
BgP	0.98	-0.04
NO ₂	0.34	0.82
Benzene	0.71	0.37
Toluene	-0.09	0.89
Varianza spiegata (%)	75	16



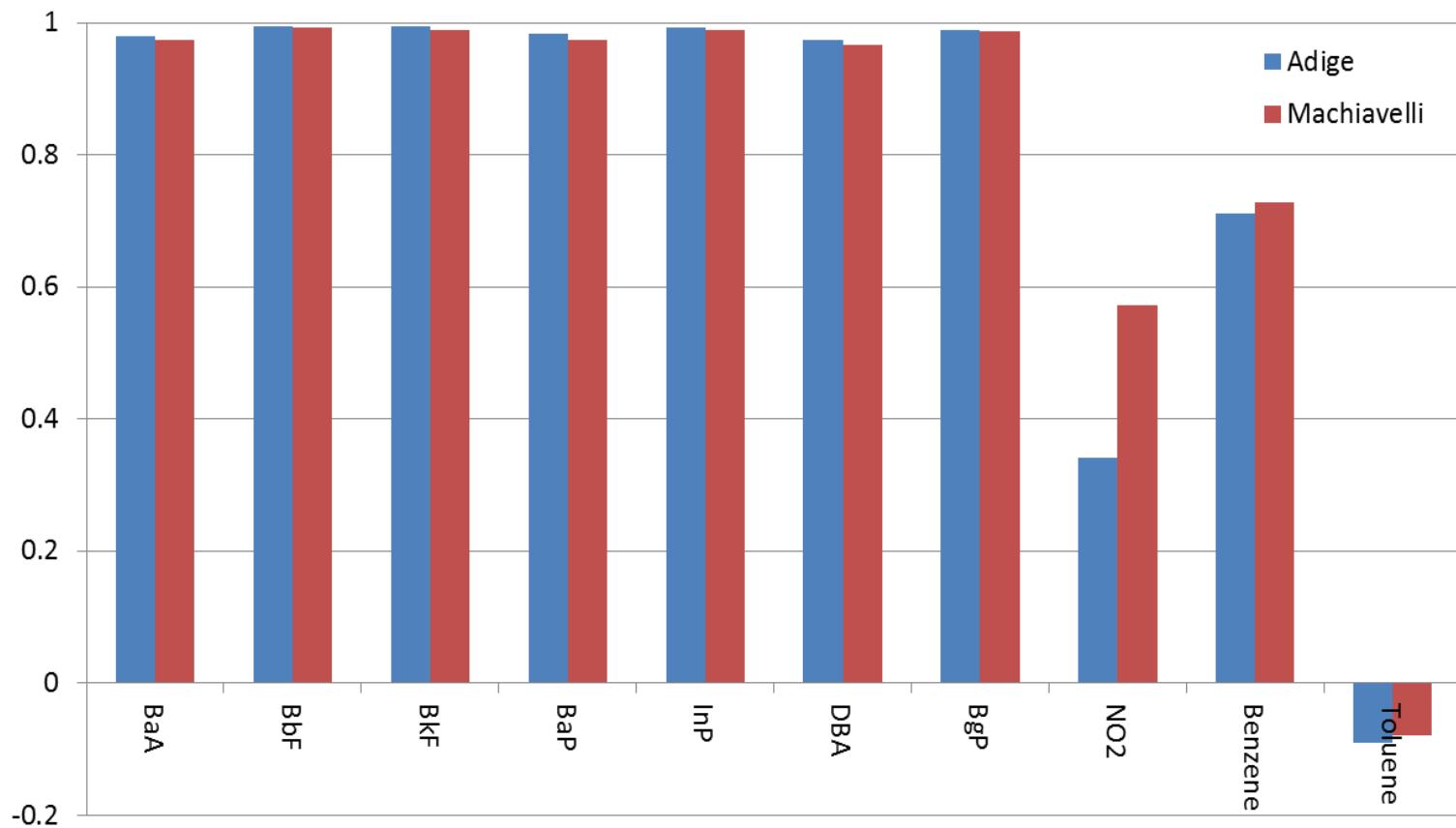
PCA MACHIAVELLI

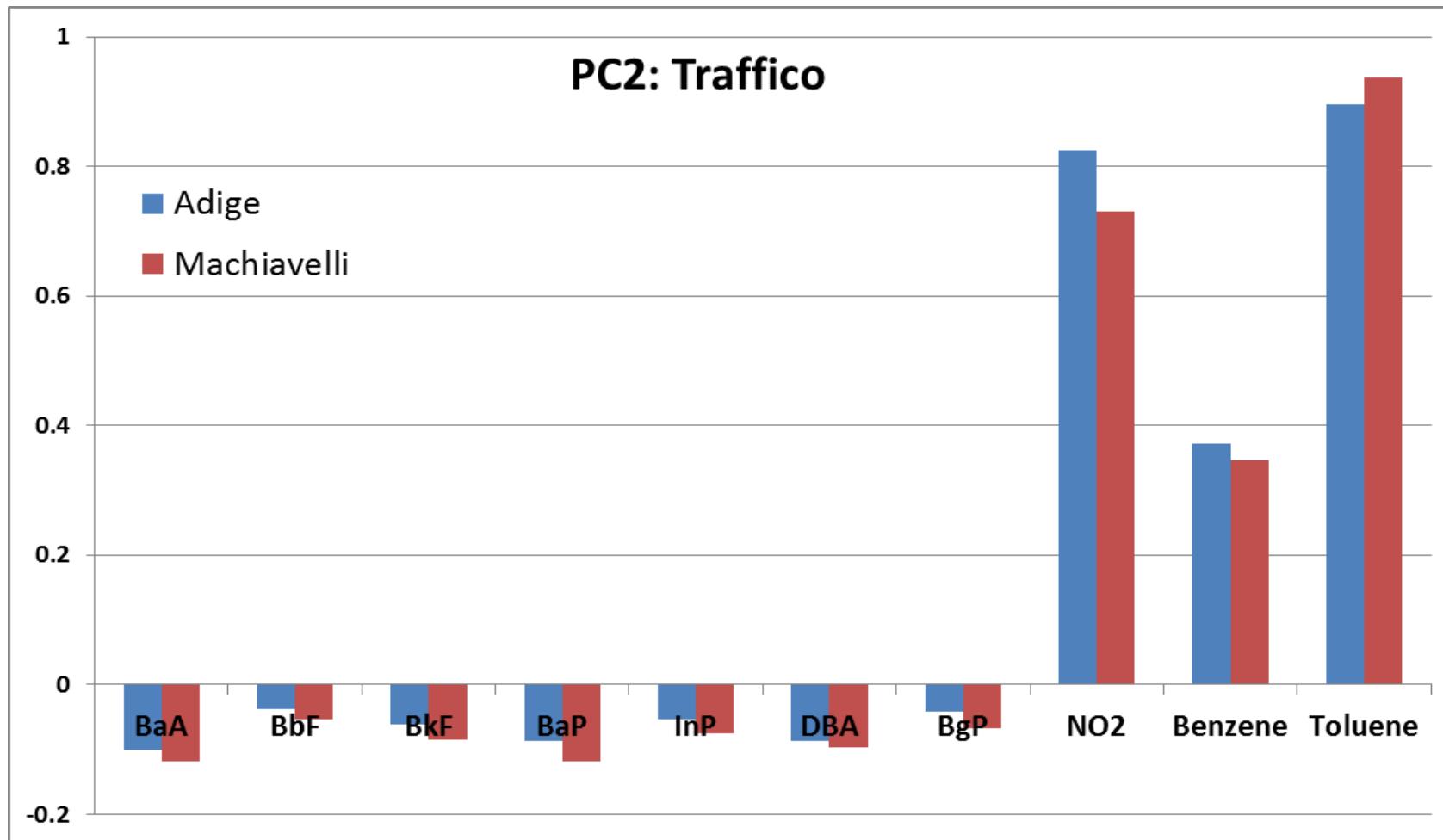
IPA + GAS

	PC1 (industriale)	PC 2 (traffico)
BaA	0.97	-0.12
BbF	0.99	-0.05
BkF	0.99	-0.08
BaP	0.97	-0.11
InP	0.99	-0.07
DBA	0.97	-0.09
BgP	0.98	-0.07
NO2	0.57	0.73
Benzene	0.73	0.35
Toluene	-0.07	0.93
Varianza spiegata (%)	75	14



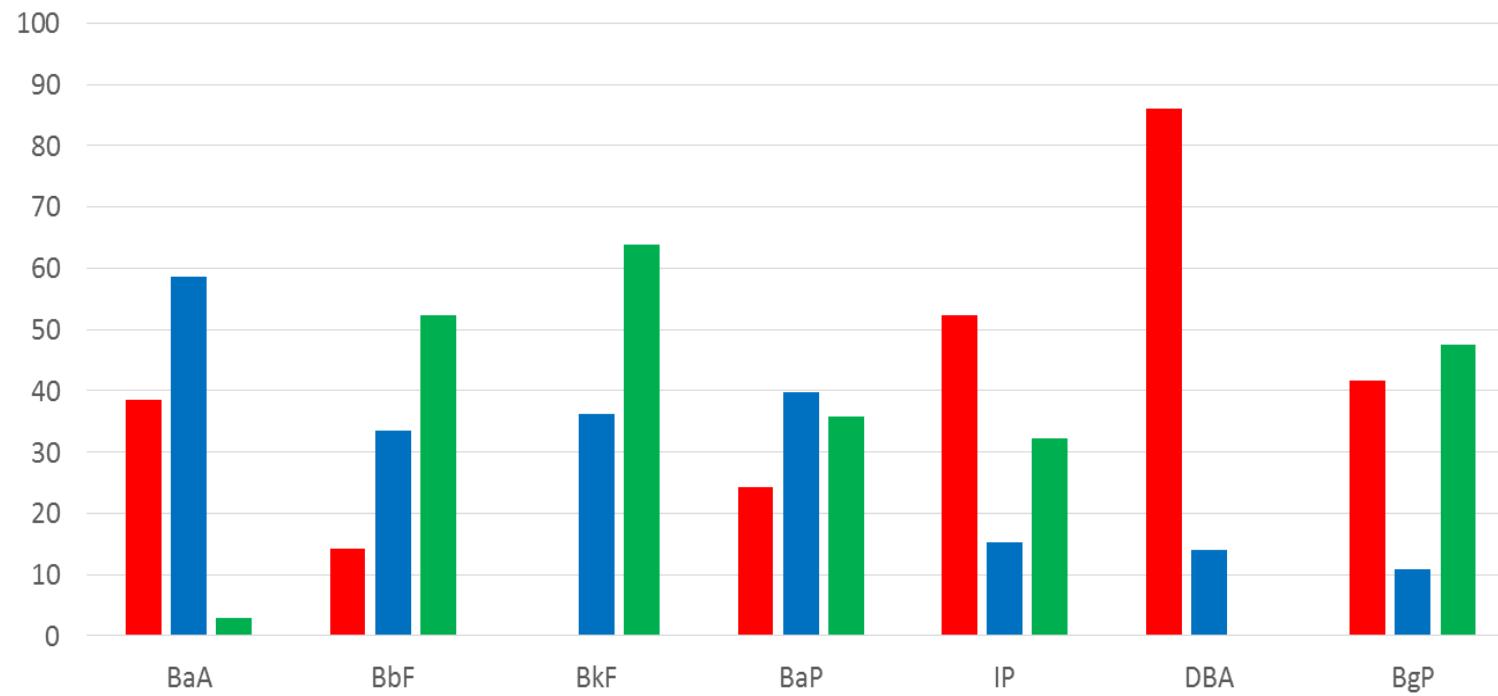
PC 1: Industriale



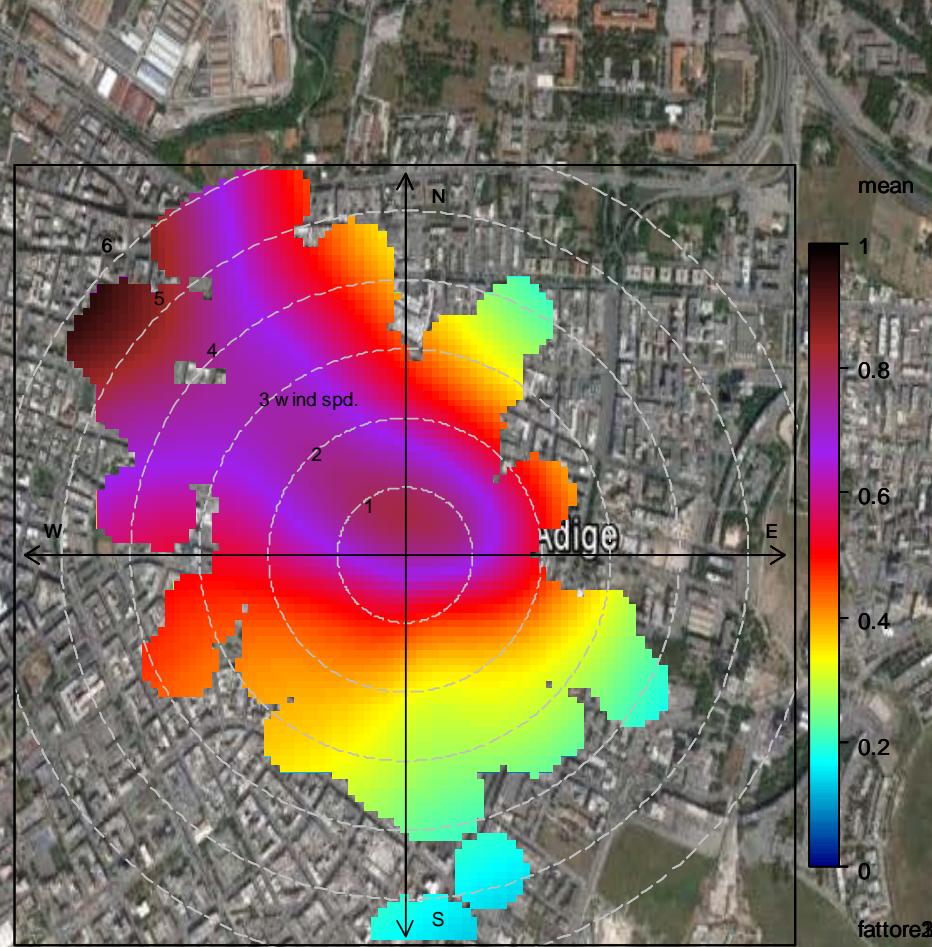




PMF ADIGE: Matrice IPA



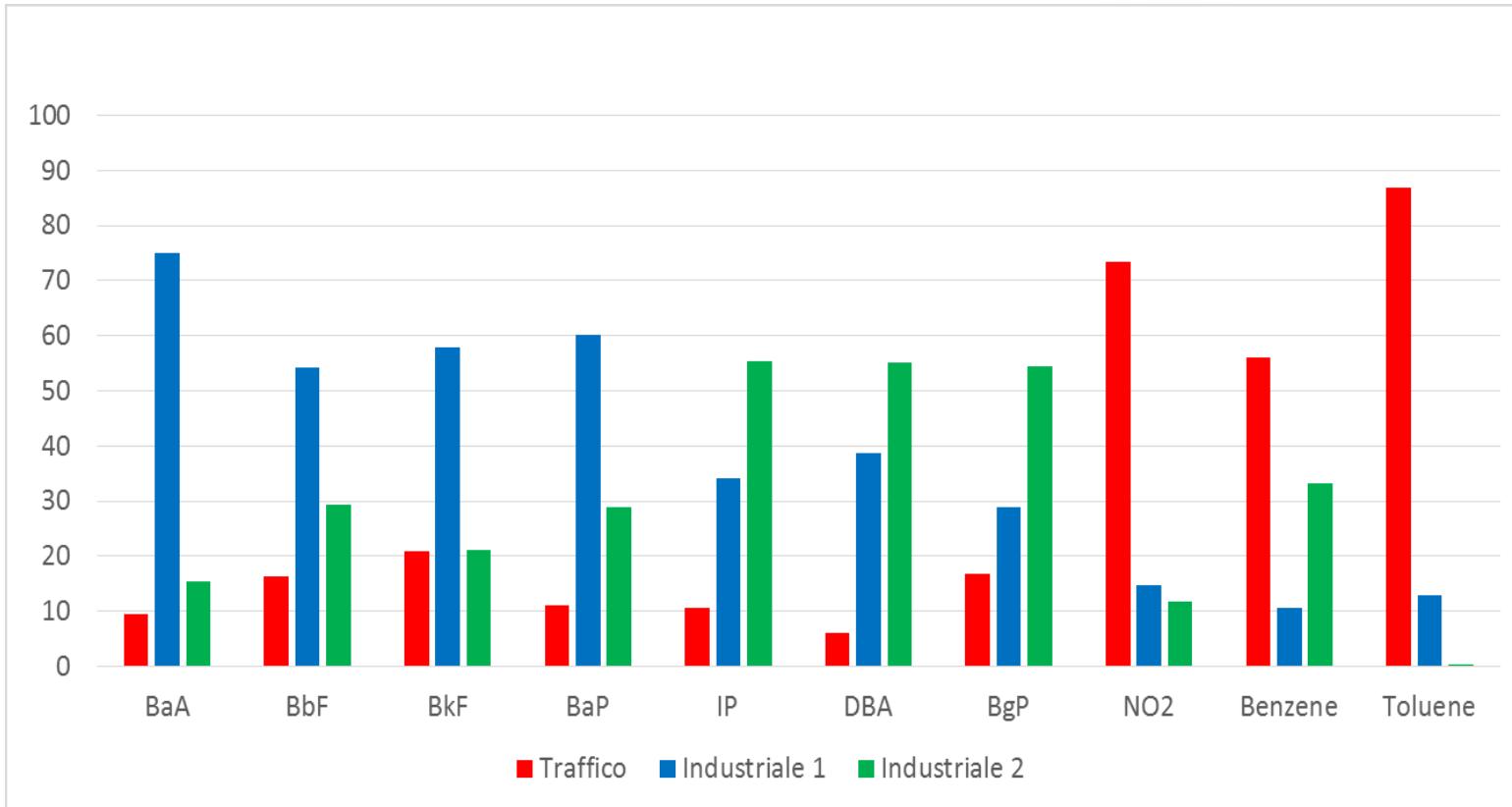
Via Alto Adige



Google earth

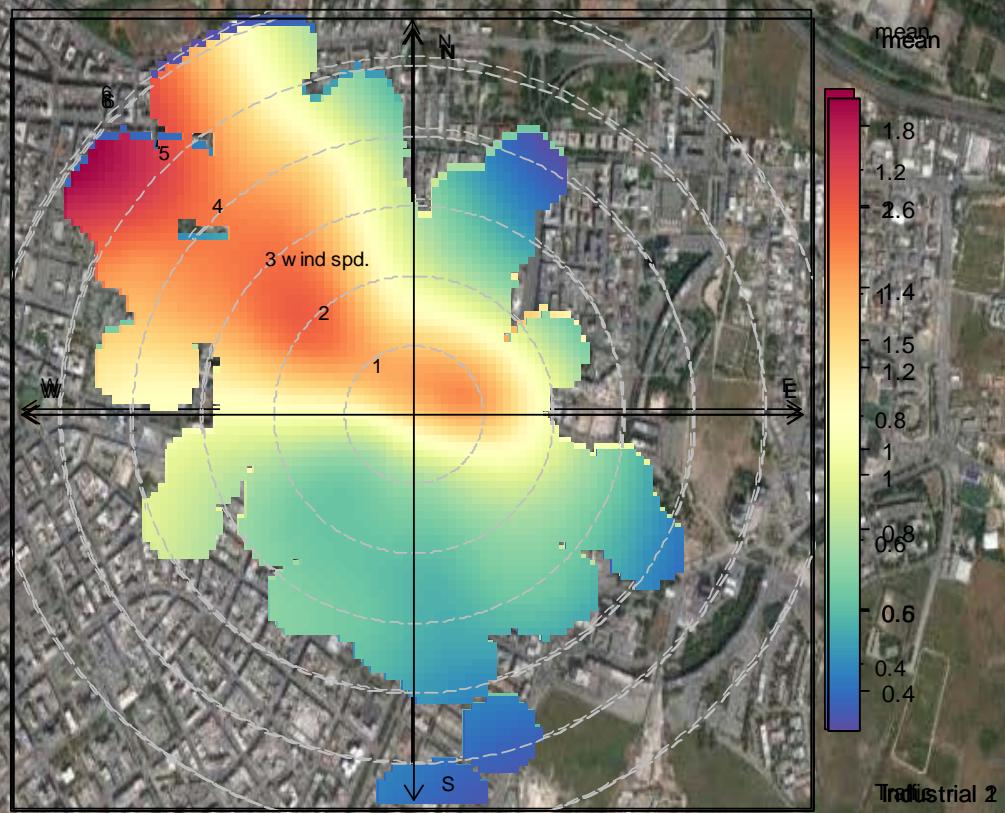


PMF ADIGE: IPA + GAS



Via Alto Adige

Industria 2

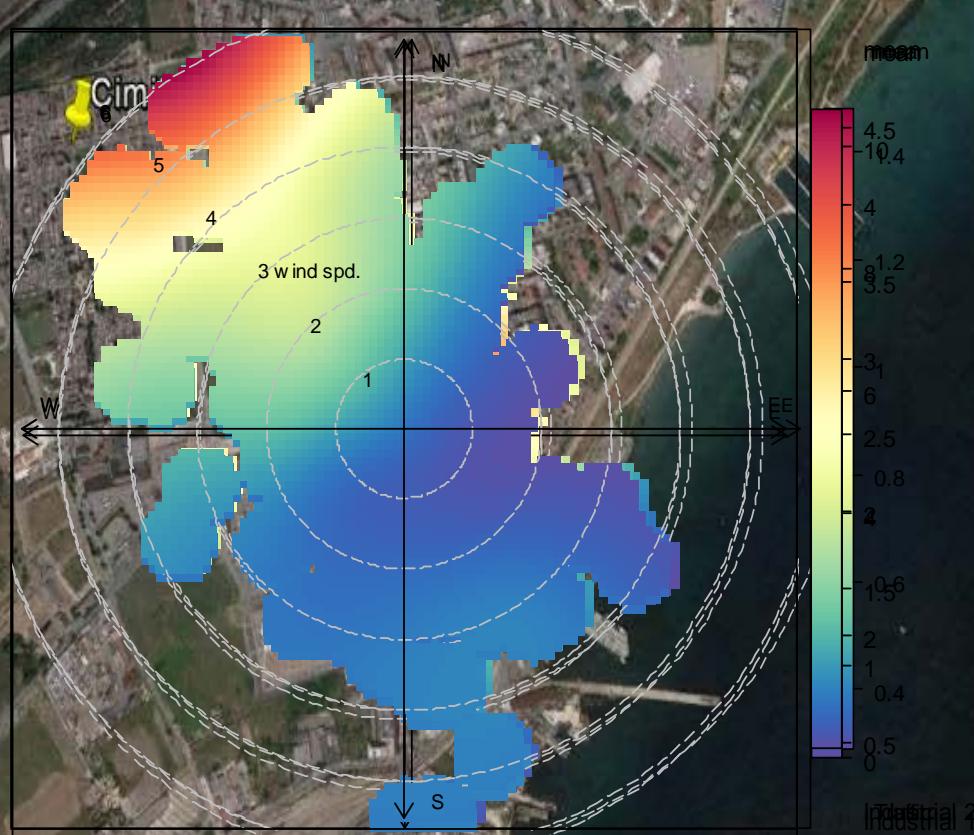


Google earth

Via Machiavelli

ILVA

In the scale 2

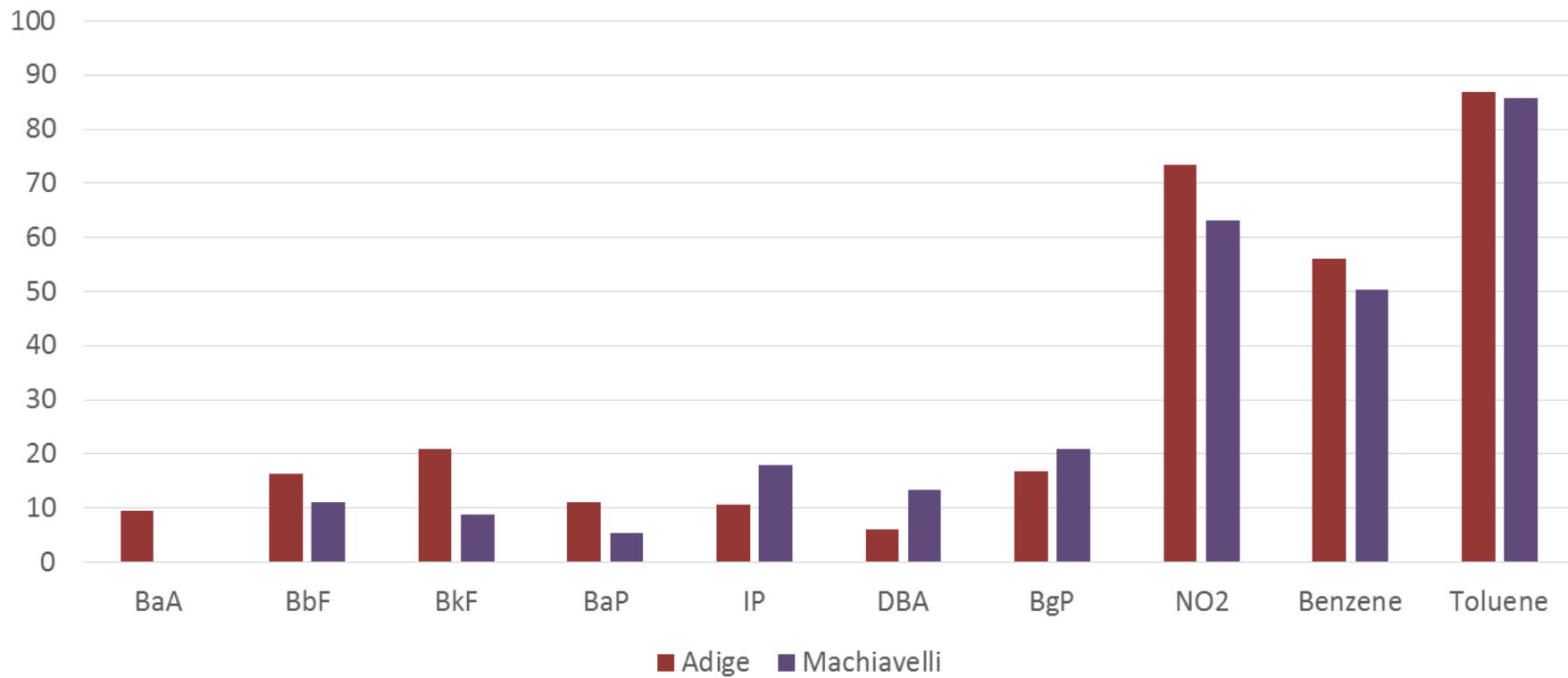


Google earth



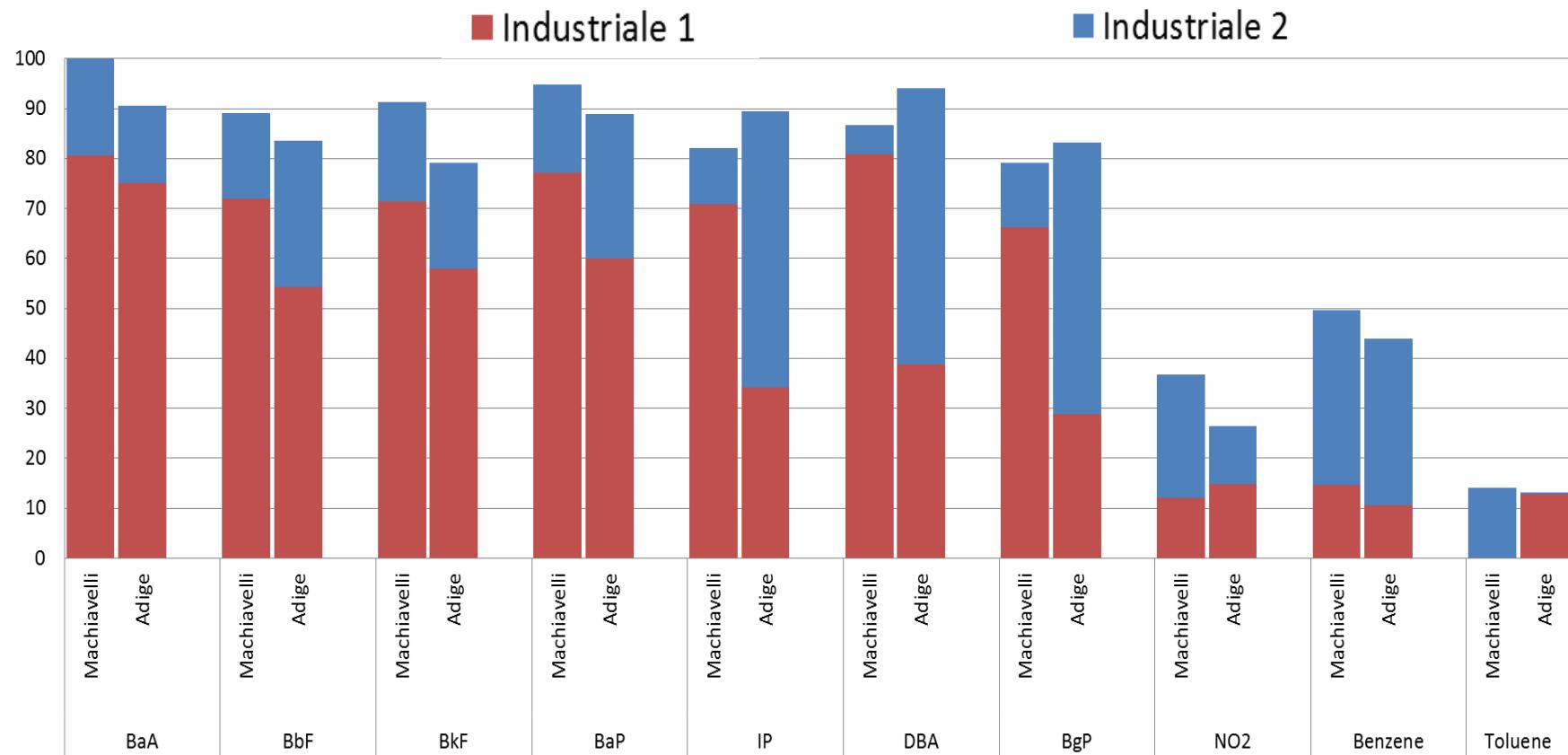
Confronto profili traffico

Traffico





Confronto profilo industriale





ADIGE (PCA loading vs PMF r^2)

Elemento	PC1 (industriale)	PC2 (traffico)
BaA	0.98	-0.10
BbF	0.99	-0.03
BkF	0.99	-0.06
BaP	0.98	-0.08
InP	0.99	-0.05
DBA	0.97	-0.08
BgP	0.98	-0.04
NO ₂	0.34	0.82
Benzene	0.71	0.37
Toluene	-0.09	0.89

Elemento	Traffico	Industriale 1	Industriale 2
BaA	-0.11	0.98	0.75
BbF	0.10	0.94	0.90
BkF	0.05	0.96	0.87
BaP	0.02	0.96	0.86
InP	0.07	0.91	0.95
DBA	0.18	0.31	0.73
BgP	-0.08	0.77	0.95
NO ₂	0.58	0.31	0.44
Benzene	0.48	0.66	0.85
Toluene	0.80	0.11	0.22



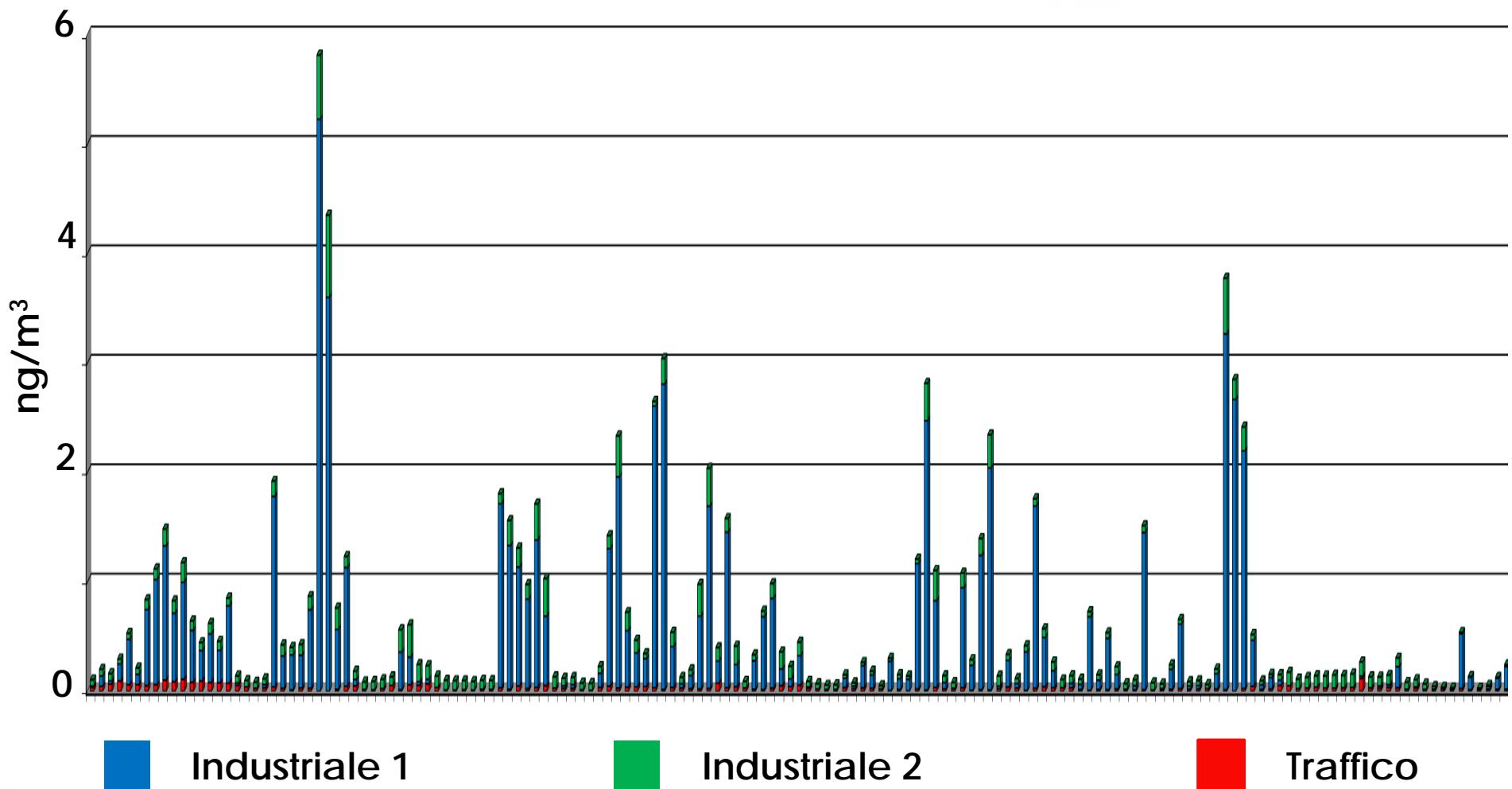
MACHIAVELLI (PCA loading vs PMF r^2)

Elemento	PC1 (industriale)	PC 2 (traffico)
BaA	0.97	-0.10
BbF	0.99	-0.06
BkF	0.99	-0.06
BaP	0.98	-0.08
InP	0.99	-0.05
DBA	0.97	-0.09
BgP	0.98	-0.04
NO ₂	0.34	0.82
Benzene	0.71	0.37
Toluene	-0.09	0.89

Elemento	Industriale 2	Industriale 1	Traffico
BaA	0.97	0.99	-0.27
BbF	0.98	0.99	-0.17
BkF	0.98	0.99	-0.21
BaP	0.99	0.98	-0.22
InP	0.99	0.98	-0.17
DBA	0.99	0.98	-0.33
BgP	0.97	0.98	-0.16
NO ₂	0.49	0.48	0.56
Benzene	0.78	0.76	0.22
Toluene	0.64	0.62	0.71

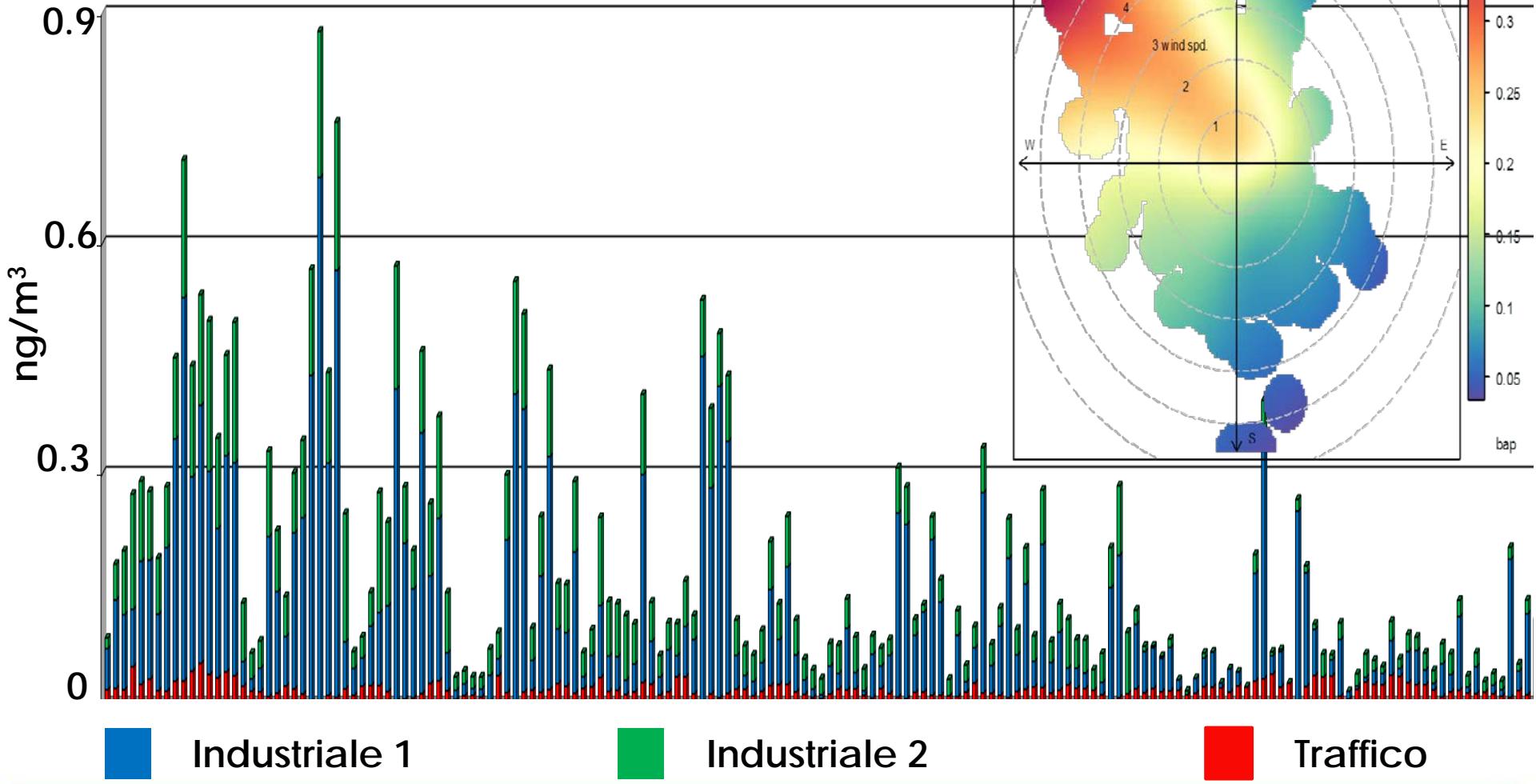


MACHIAVELLI BaP



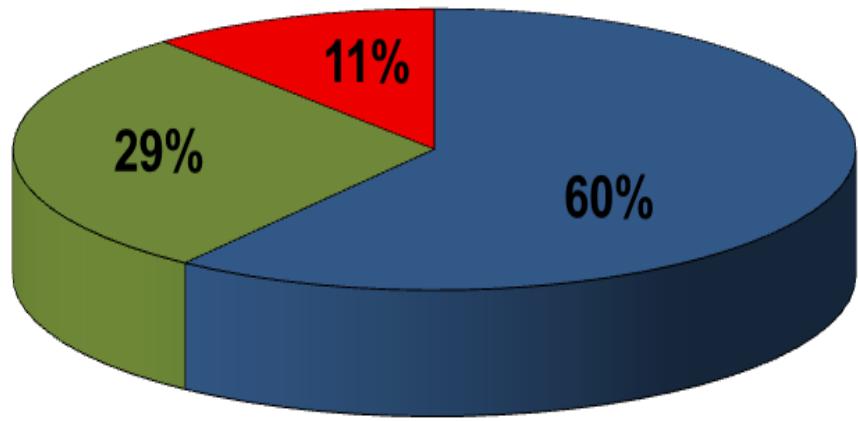


ADIGE BaP



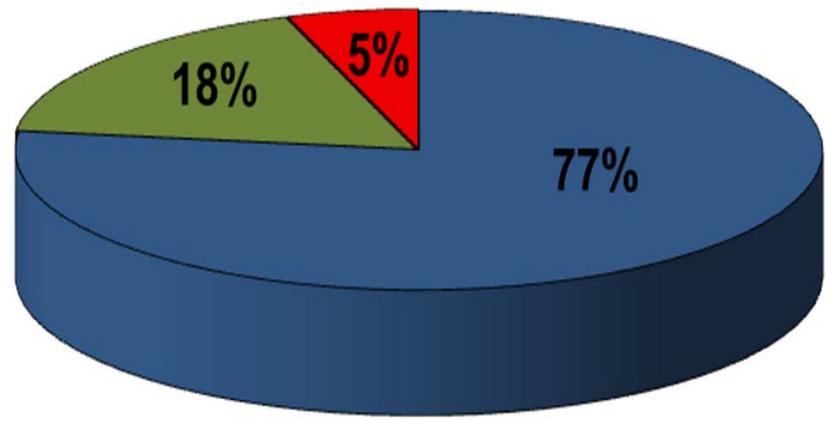


Adige BaP



■ Industriale 1 ■ Industriale 2 ■ Traffico

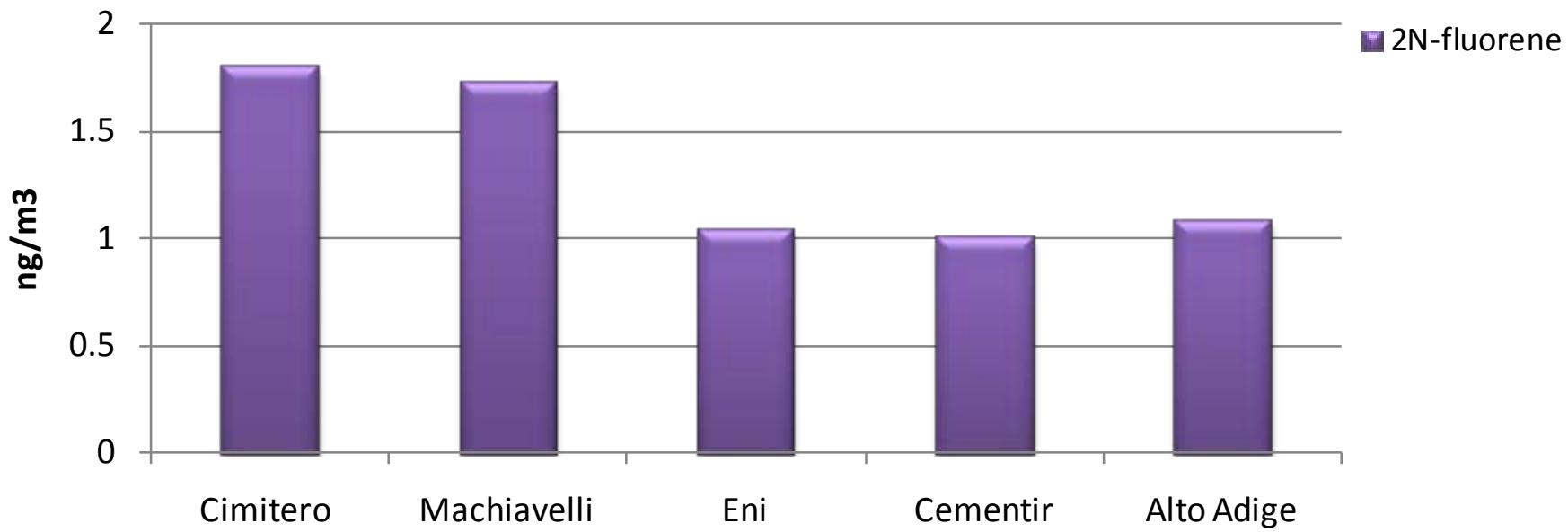
Machiavelli BaP



■ Industriale 1 ■ Industriale 2 ■ Traffico



2N-fluorene





Confronto bibliografico

⊕ PM²⁰¹⁴

Site	Sampler type	Source type	2-NNI	3-NFI	1-NPyR	6-NCry
Dimashki et al., 2000	PM	Urban, near traffic site		NA	0.090	
Feilberg et al., 2001	PM	Traffic site		0.039	0.127	
Marino et al., 2000	PM	Urban		NA	0.060	
Wilson et al., 1995	PM	Urban		NA	0.0093	
Albinet et al., 2007a, 2007b	PM10	Urban	0.0214	0.0137	0.0607	0.0331
<i>Las Condes^a</i>	PM10	Urban	0.023	0.22	0.074	
<i>Providencia^a</i>	PM10	Urban, near high traffic site	0.42	1.5	0.6	
Hien et al., 2007	PM	Urban			0.0081	
Hien et al., 2007	PM	Urban			0.0091	
Hien et al., 2007	PM	Urban, near traffic site			0.073	
Di Filippo et al., 2010	Low pressure impactor (PM2.5)	<i>LaSapienza University of Rome^b</i>		0.00004	0.00015	0.0002
Teixeira et al., 2011	PM2.5-10	Urban, near high traffic site	0.63	0.27	0.24	0.22
Teixeira et al., 2011	PM2.5	Urban, near high traffic site	0.57	0.49	0.42	0.77
This study, Cimitero	PM10	Urban, near industries	1,1715	0,0353	0,0551	0,1754
This study, Machiavelli	PM10	Urban	0,5062	0,1130	0,0528	0,0969
This study, ENI	PM10	Industrial zone	0,1890	0,0207	0,0377	0,0851
This study, Adige	PM10	Urban	0,1242	0,0130	0,0360	0,1179
This study, Cementir	PM10	Industrial zone	0,1940	0,1183	0,0347	0,0599

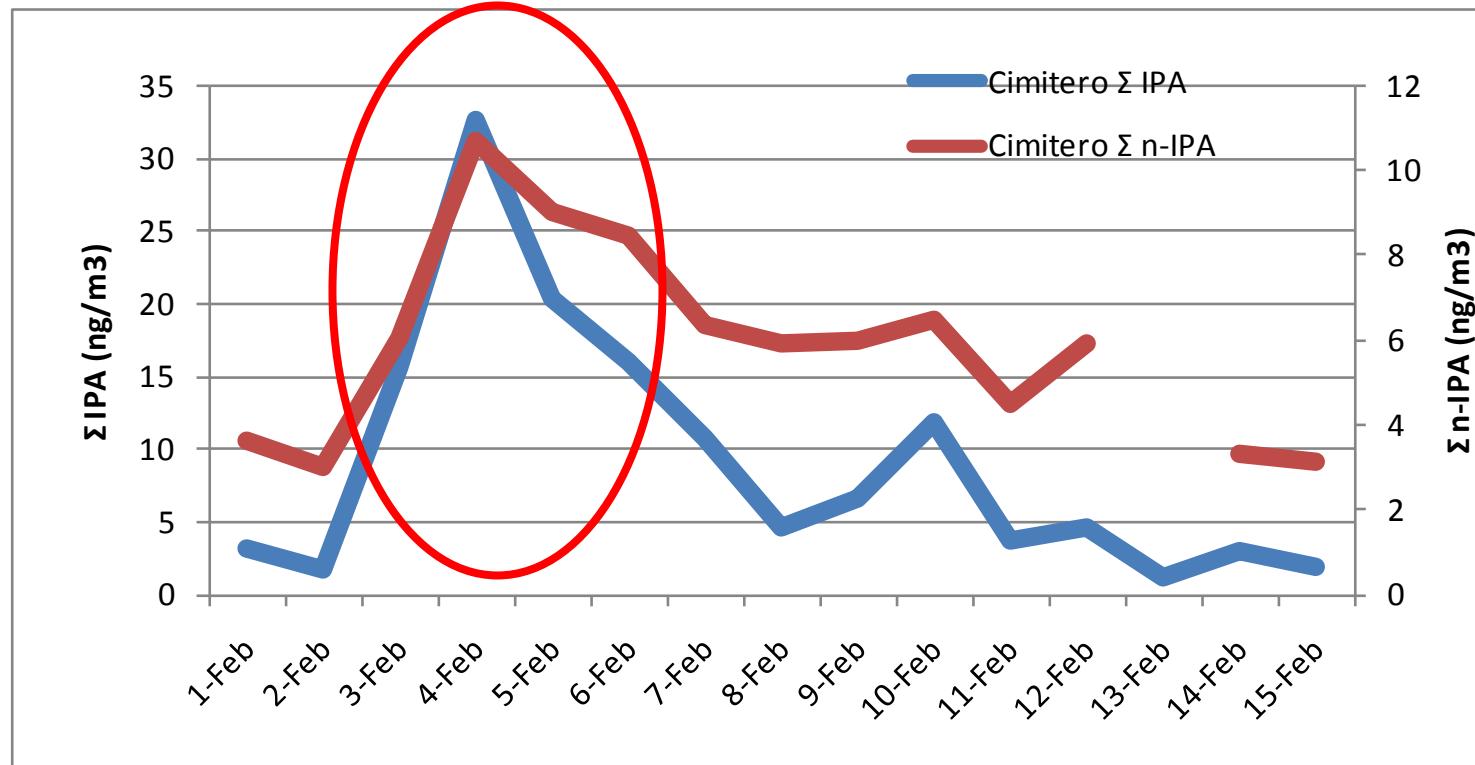
^a Sienra and Rossanza 2006

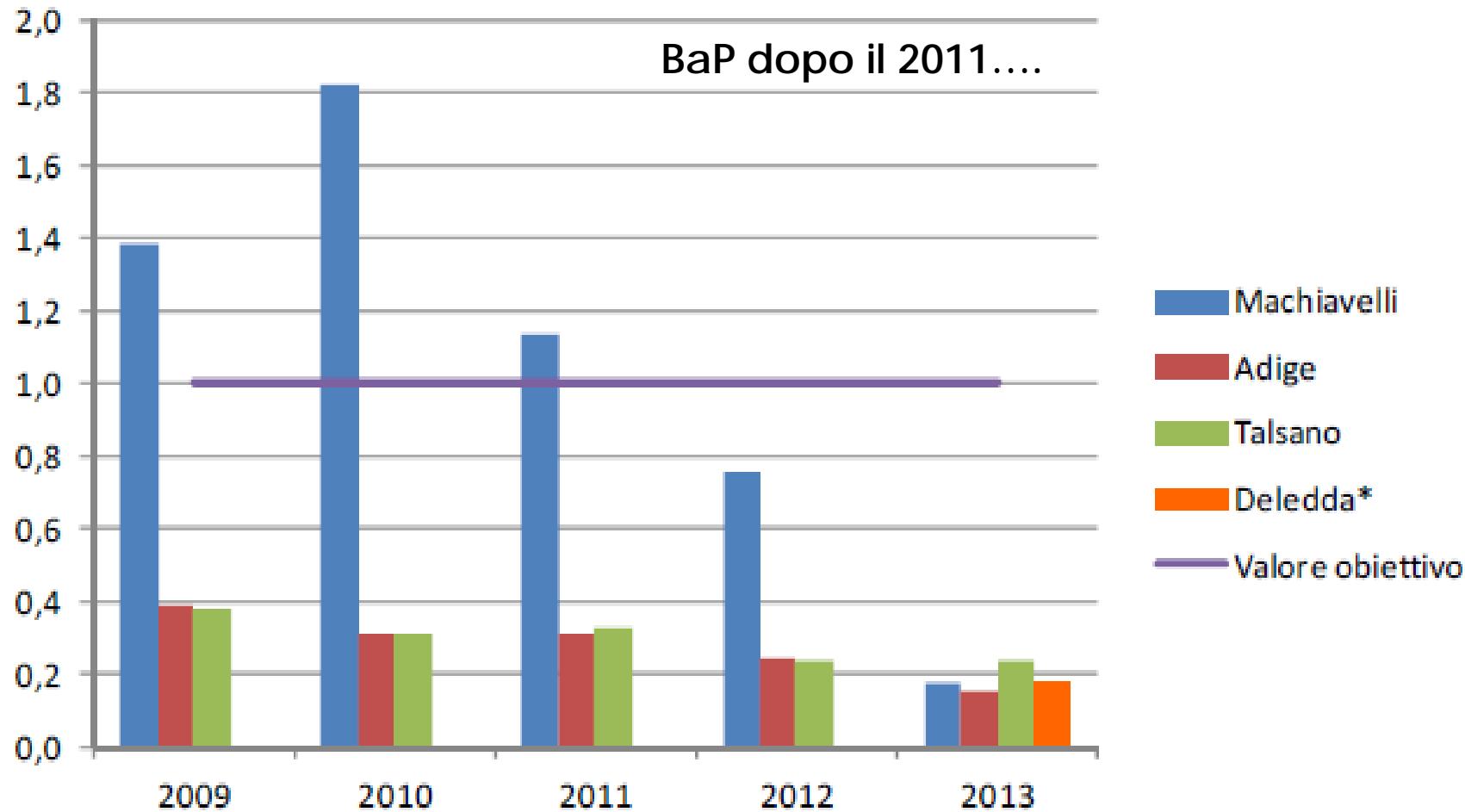
- 2-NNI 2-nitro fluorene
- 3NFI 3-nitrofluoranthene
- 1-NPyR 1-nitro pyrene
- 6-NCry 6-nitro crysene

^b Site not affected by direct emission



Sito: Cimitero. Confronto tra IPA e Nitro-IPA





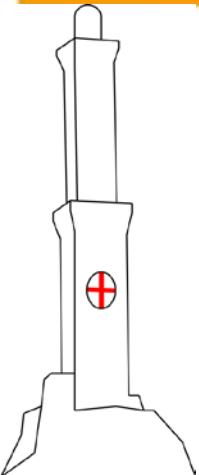


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GRAZIE



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