



Statens vegvesen



Bedre byluftforum

Hva sier måledataene om årsaker til dårlig luftkvalitet

Pål Rosland

12. april 2015

Luftforurensningsnivået beskrevet med statistiske modeller

NR Norsk Regnesentral
NORWEGIAN COMPUTING CENTER

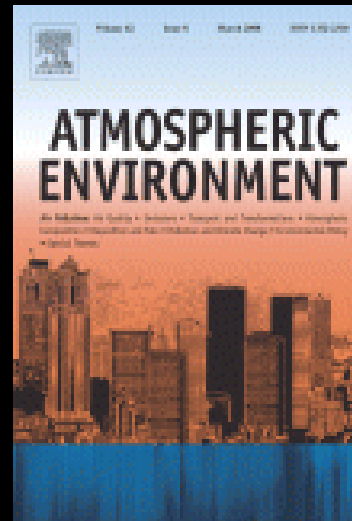
Notat

Effekt av vasking, feiing og salting i Strømsås-tunnelen vinteren 04/05



Notatnr SAMBA/21/06
Forfatter Magne Aldrin,
Dato 20. juni 2006

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NR Norsk Regnesentral
NORWEGIAN COMPUTING CENTER

Notat

Analyse av luftkvalitet og effekt av støvdemping basert på data fra 2001-2009



Notatnr SAMBA/11/10
Forfattere Magne Aldrin,
Gunnhildur Högnadóttir Steinbakk,
Pål Rosland
Dato 25. mars 2010

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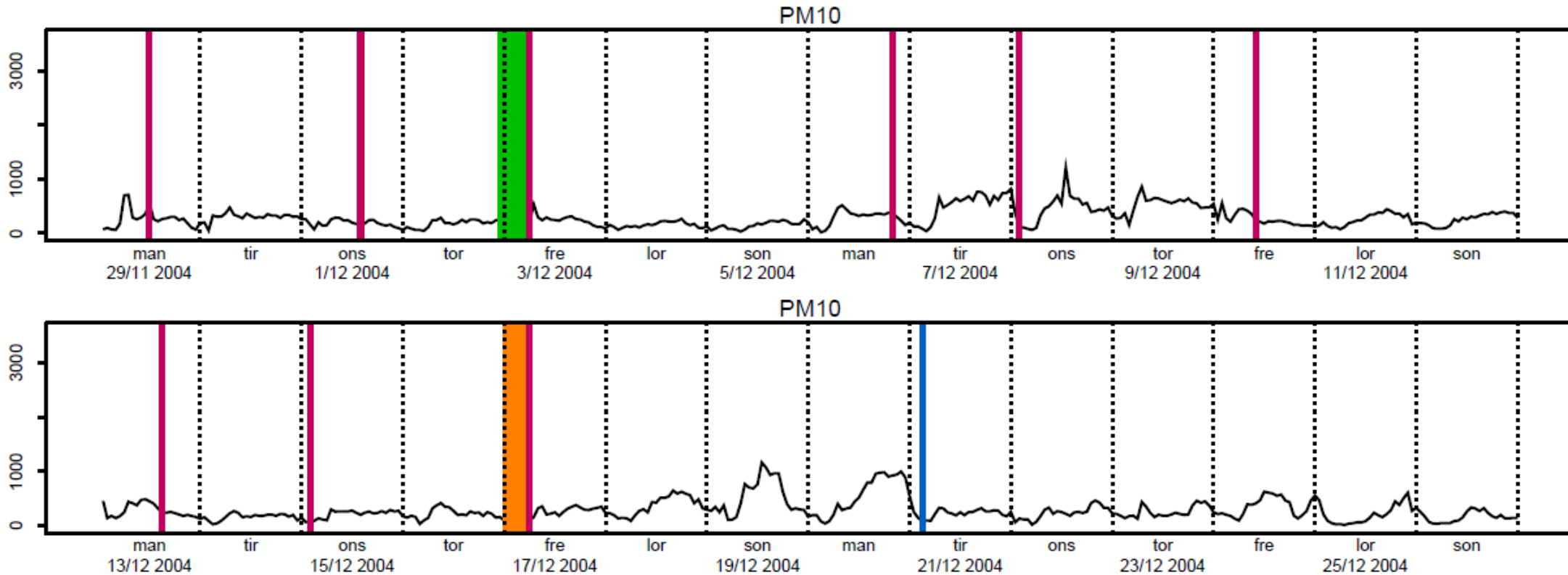
The effect of salting with magnesium chloride on the concentration of particular matter in a road tunnel
Magne Aldrin, Ingrid Hobæk Haff, Pål Rosland

<http://www.sciencedirect.com/science/article/pii/S1352231007010680>



Støvdemping og feiing i Strømsåstunnelen

Forsøksoppsett vinteren 2004/5

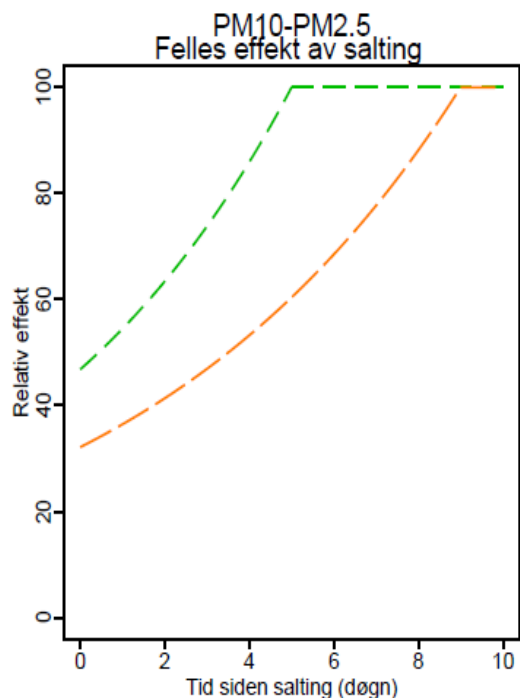


Grønn: Vasking. Gul: Feiing. Lilla: Salting med 20g/m². Blå: Salting med 40.

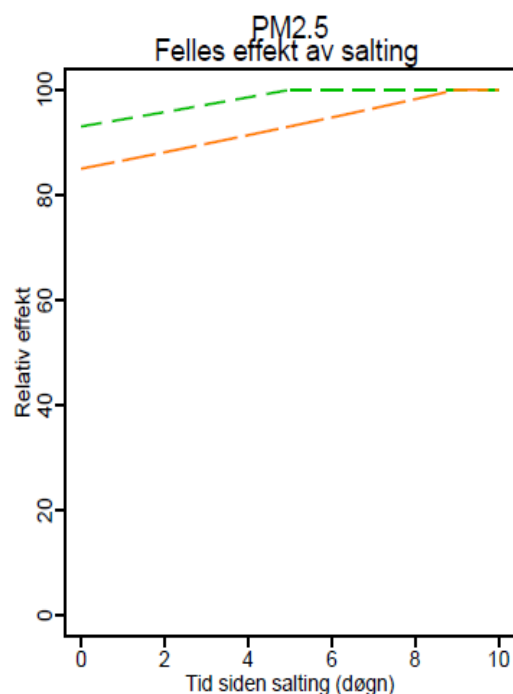


Støvdemping og feiing i Strømsåstunnelen

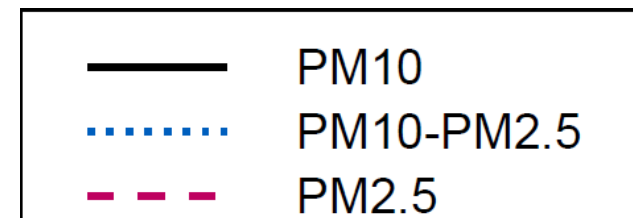
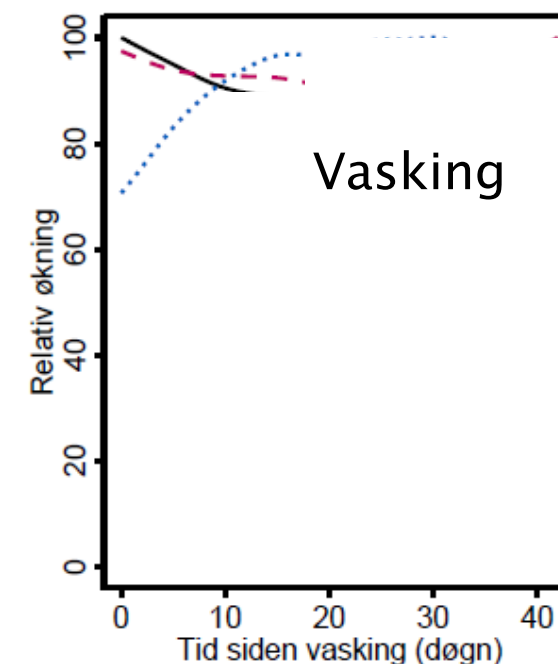
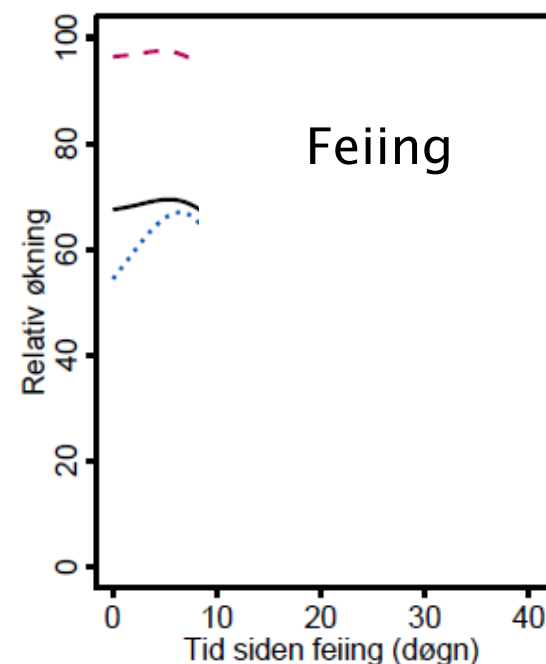
Effekt av støvdemping, feiing og vasking



God effekt på
PM grovfraksjonen



Dårligere effekt på
PM finfraksjonen

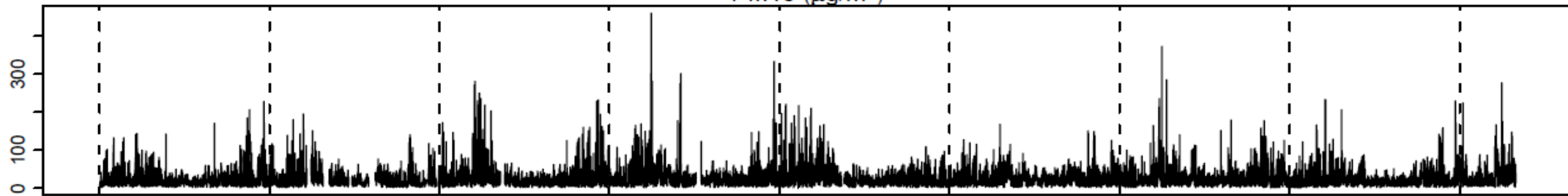




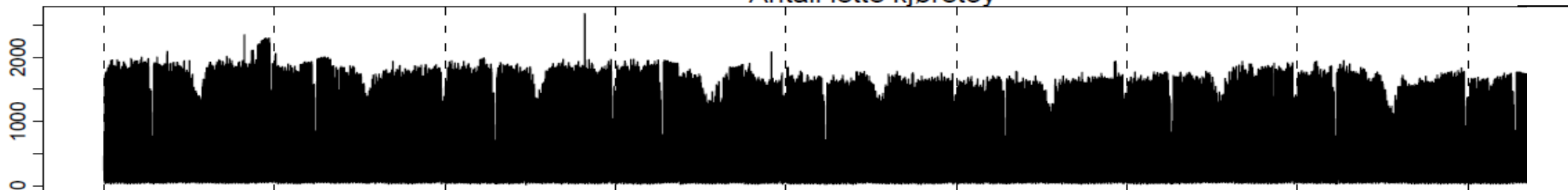
70 000 timer med måledata fra Kirkeveien

Utvalgte dataserier

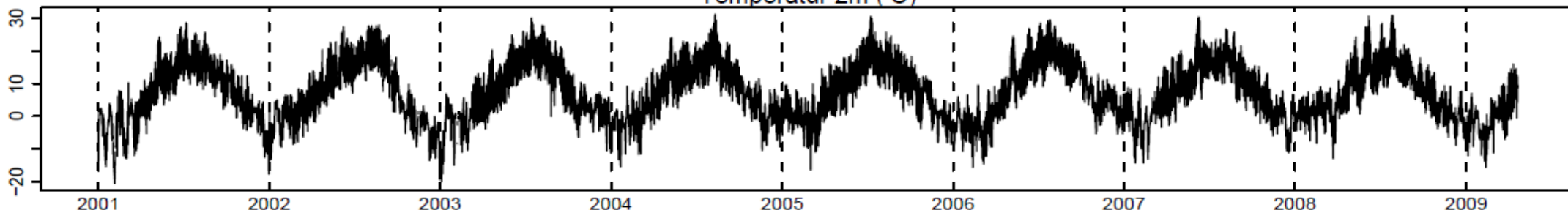
PM10 ($\mu\text{g}/\text{m}^3$)



Antall lette kjøretøy



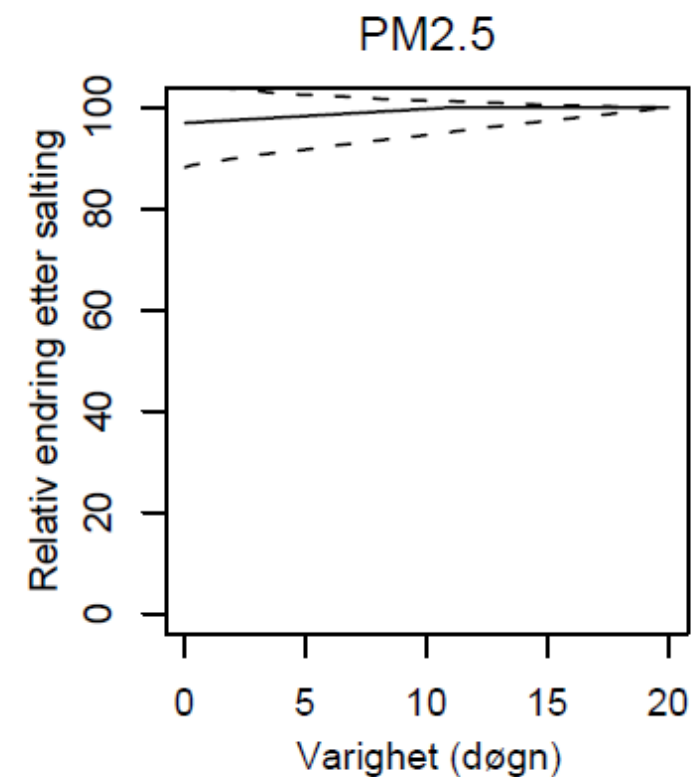
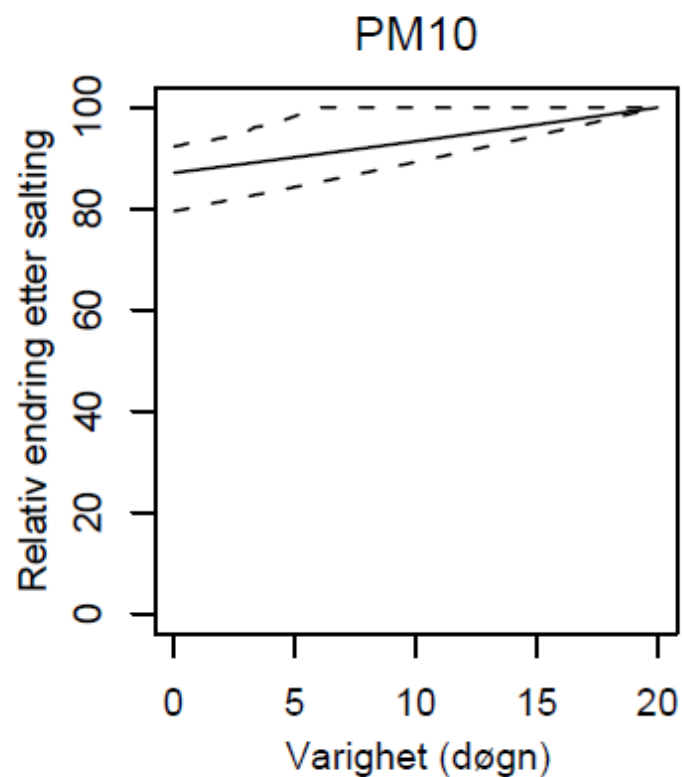
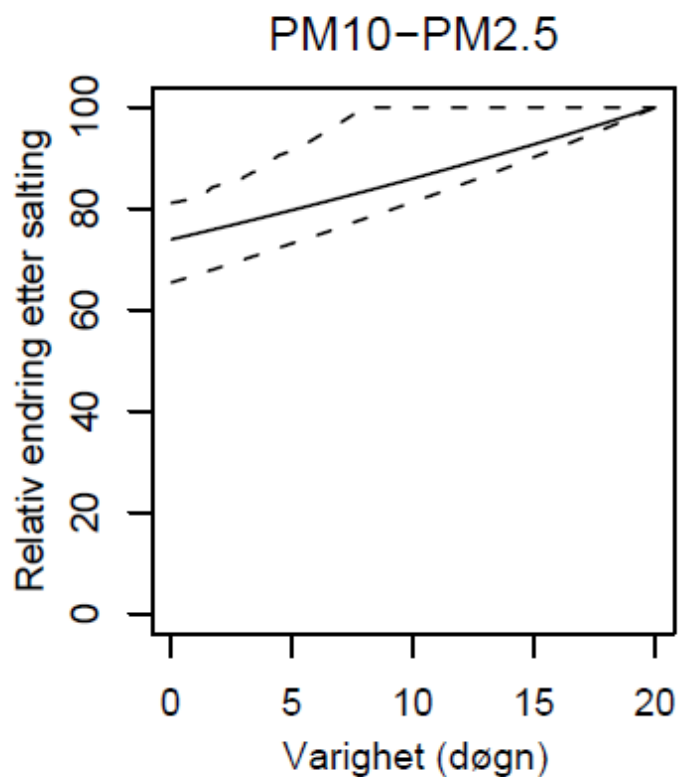
Temperatur 2m ($^{\circ}\text{C}$)





Støvdemping

Effekt av å legge ut $MgCl_2$ -løsning

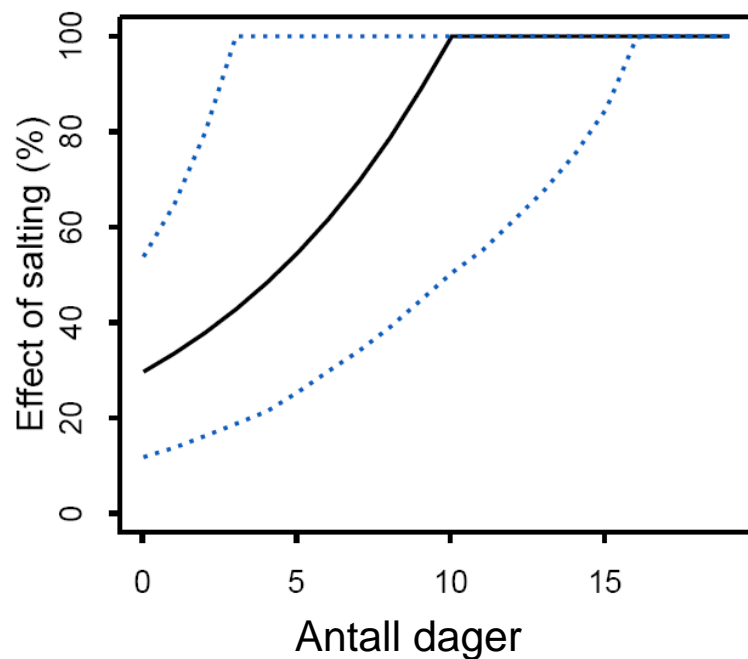




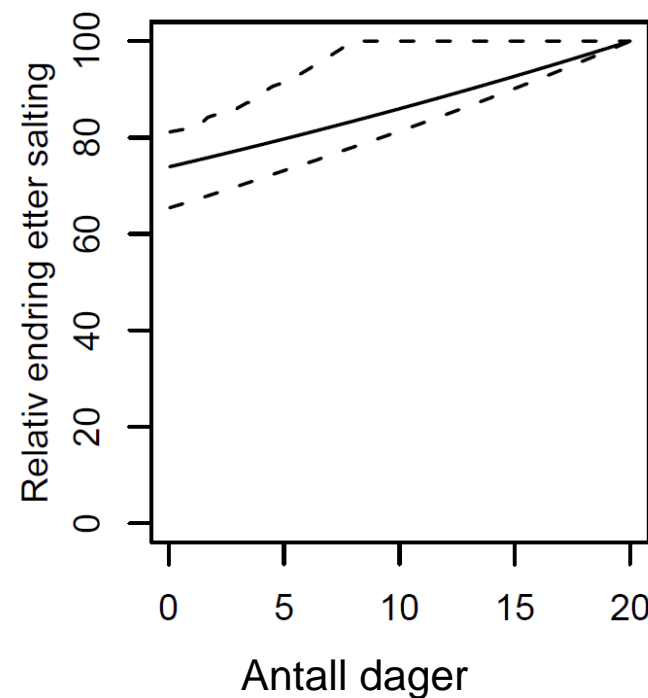
Støvdemping virker best på grovt svevestøv

Effekt av å legge ut $MgCl_2$ -løsning

Inne i Strømsåstunnelen i Drammen

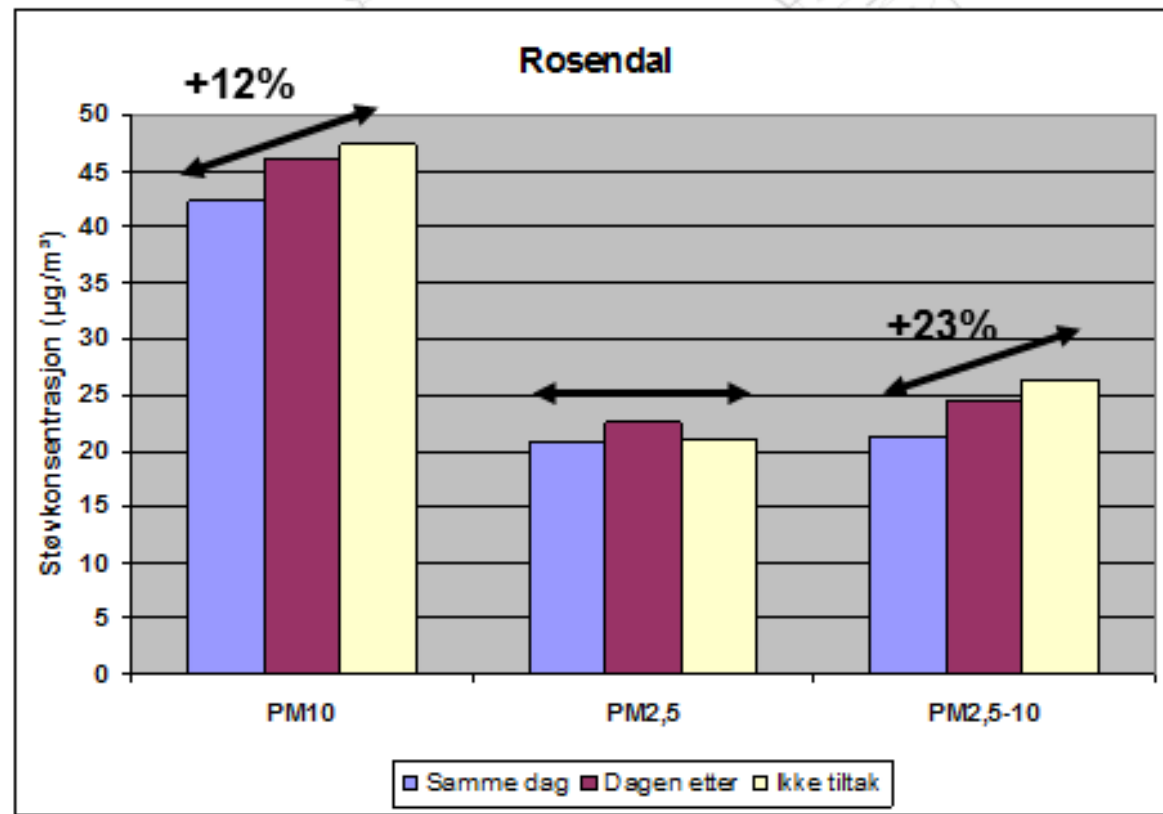
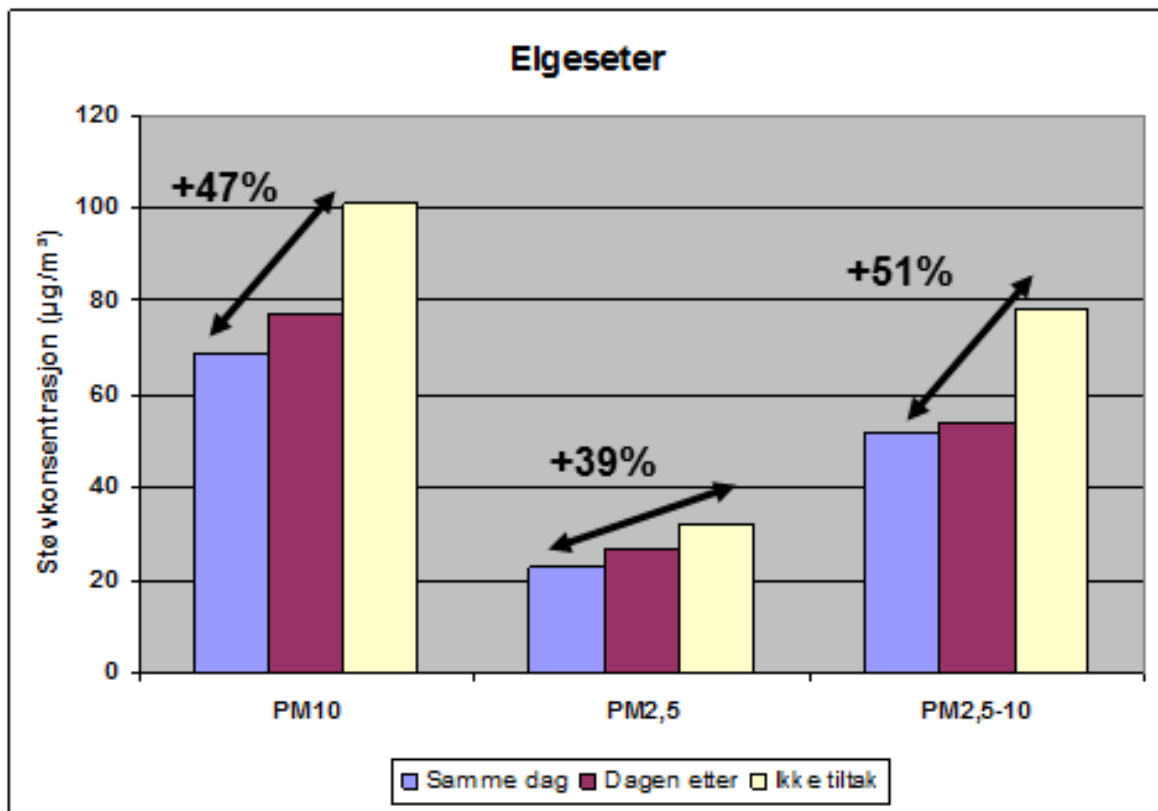


Ute i Kirkeveien i Oslo:





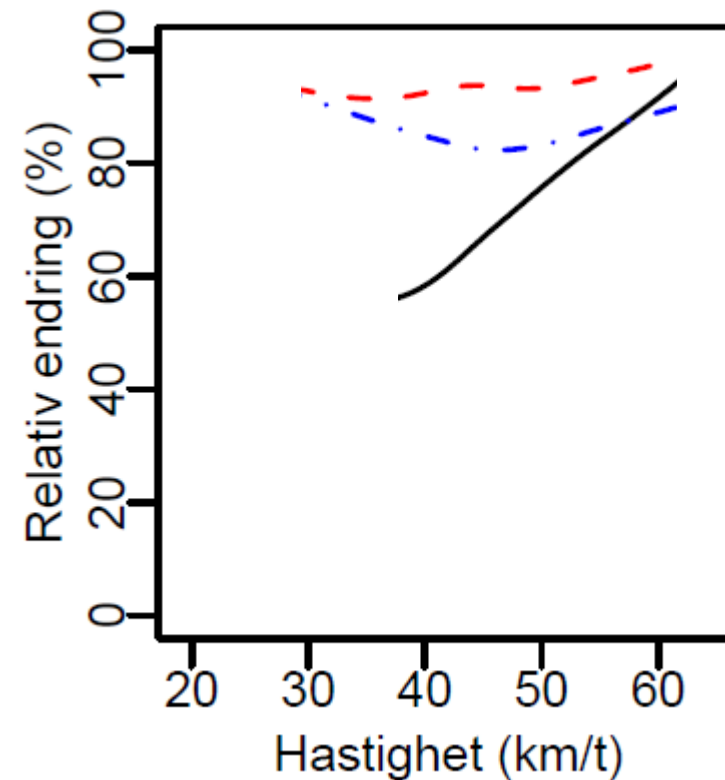
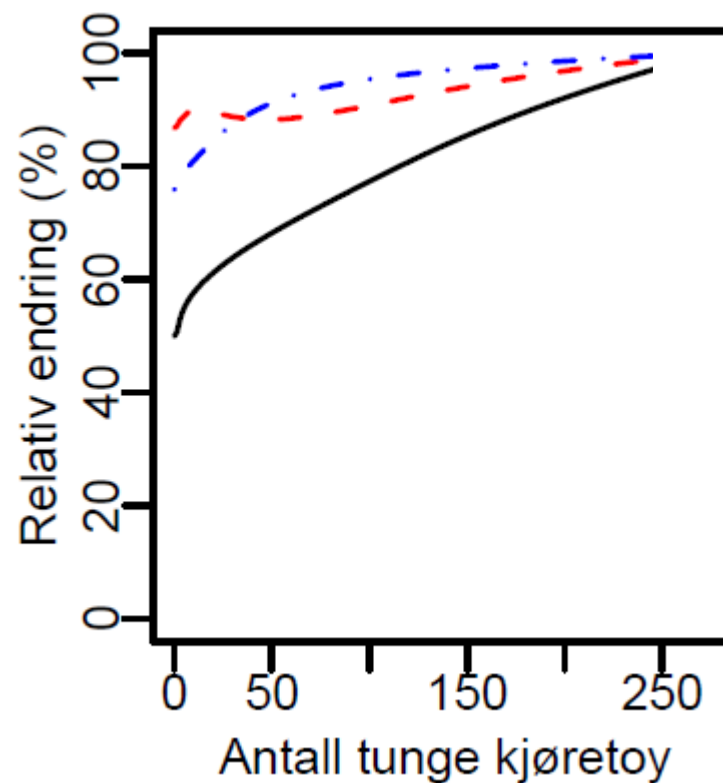
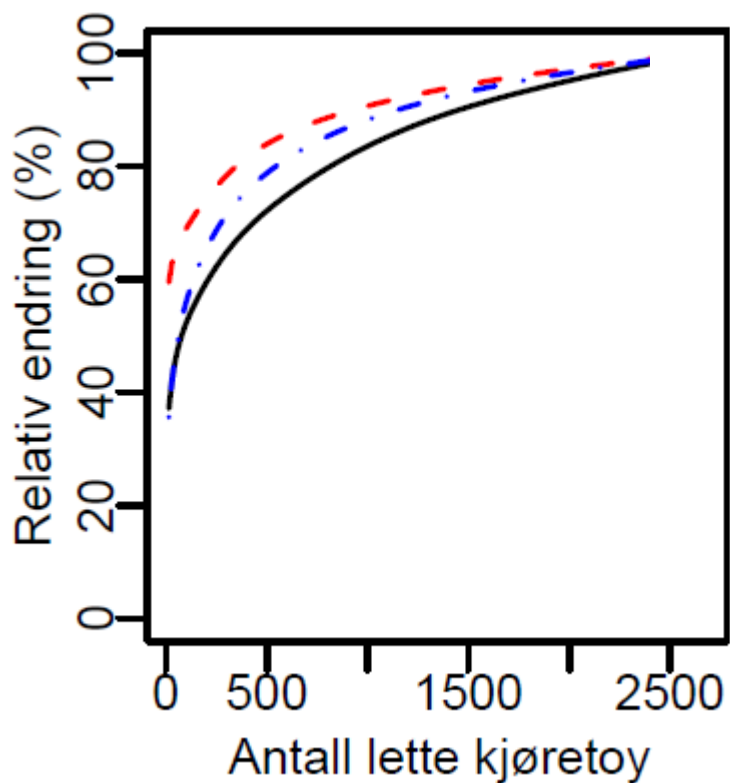
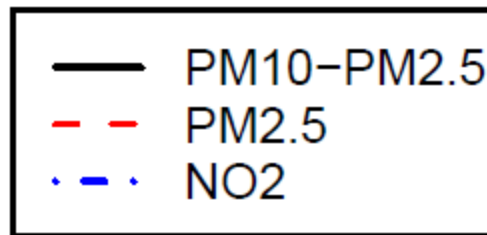
Effekter på svevestøv (døgn)





Analyse av luftkvalitet

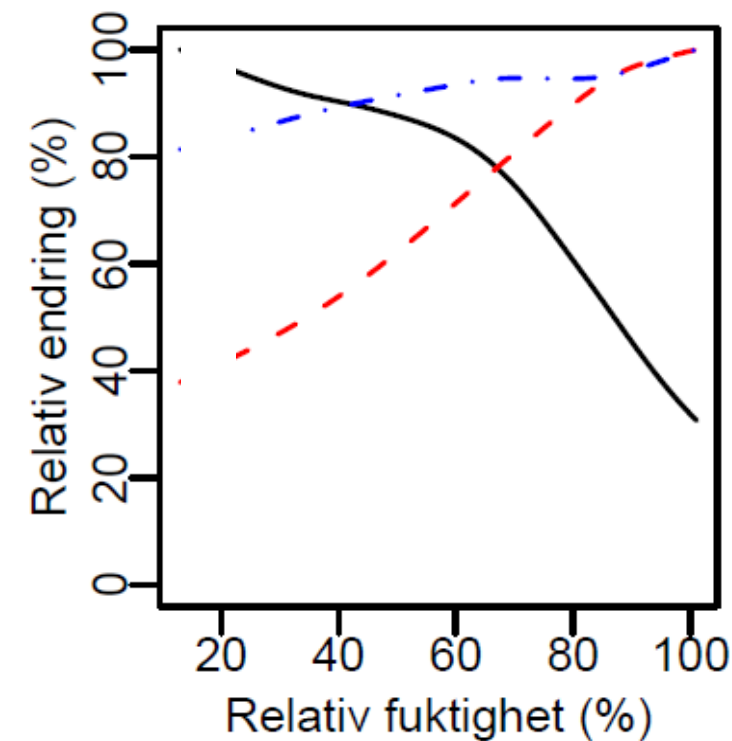
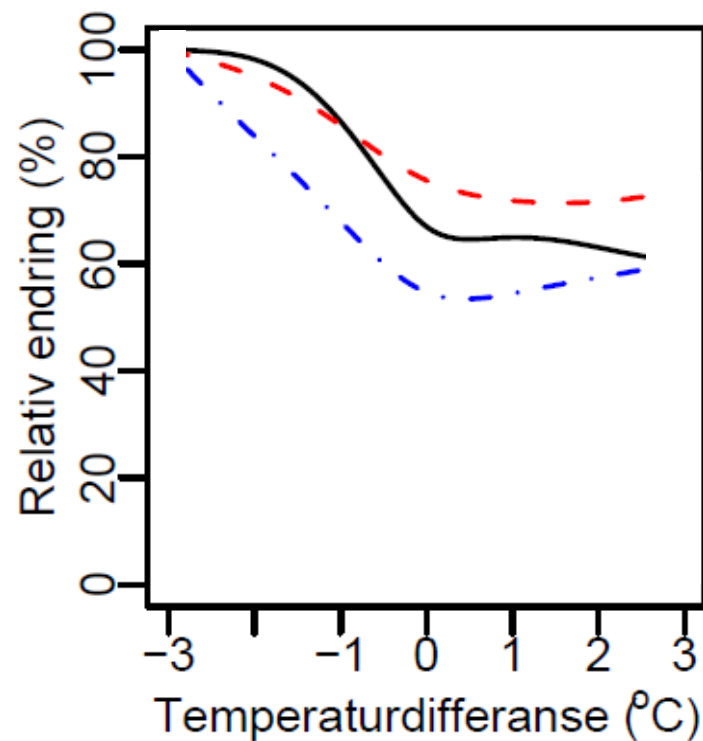
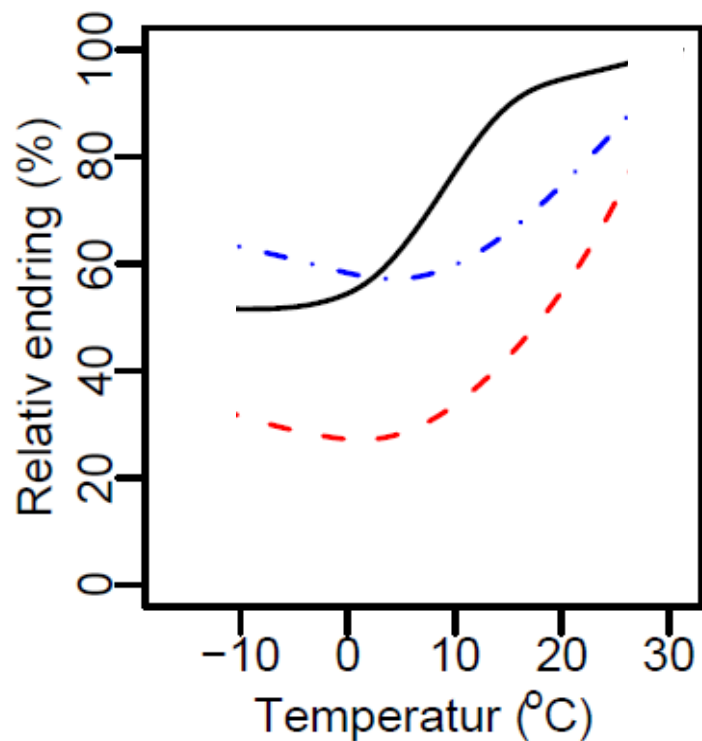
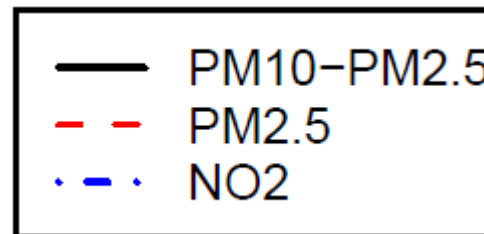
Kjøretøyene bidrag





Analyse av luftkvalitet

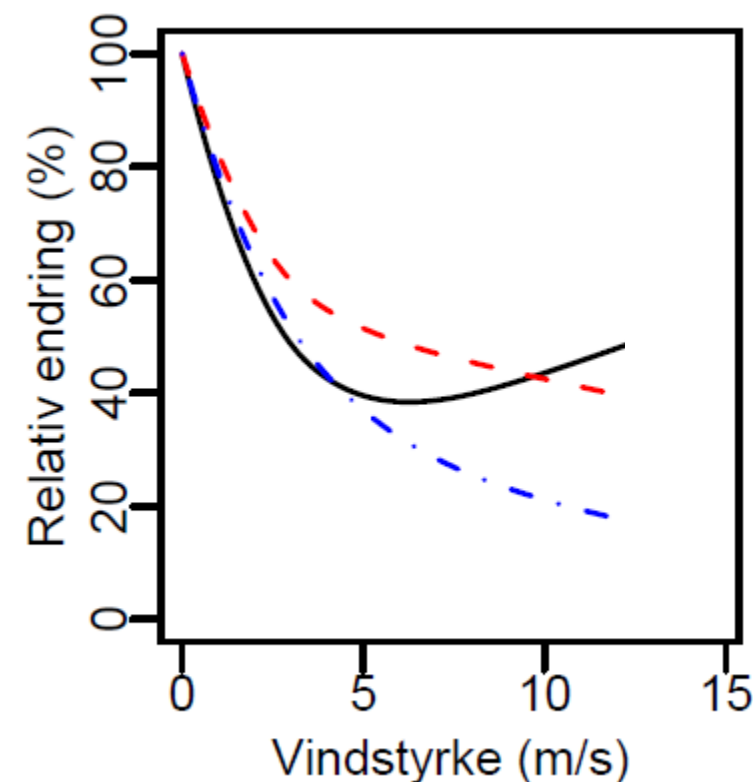
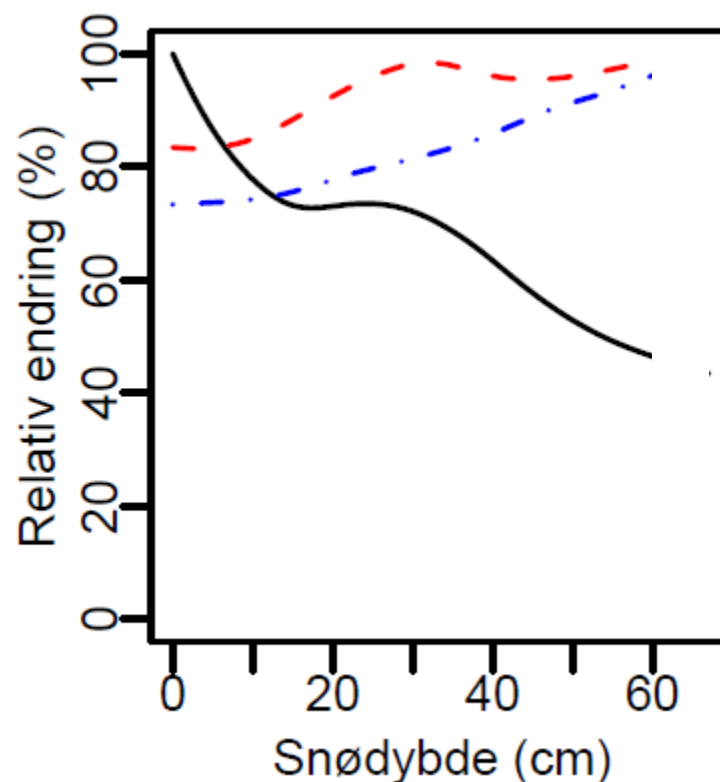
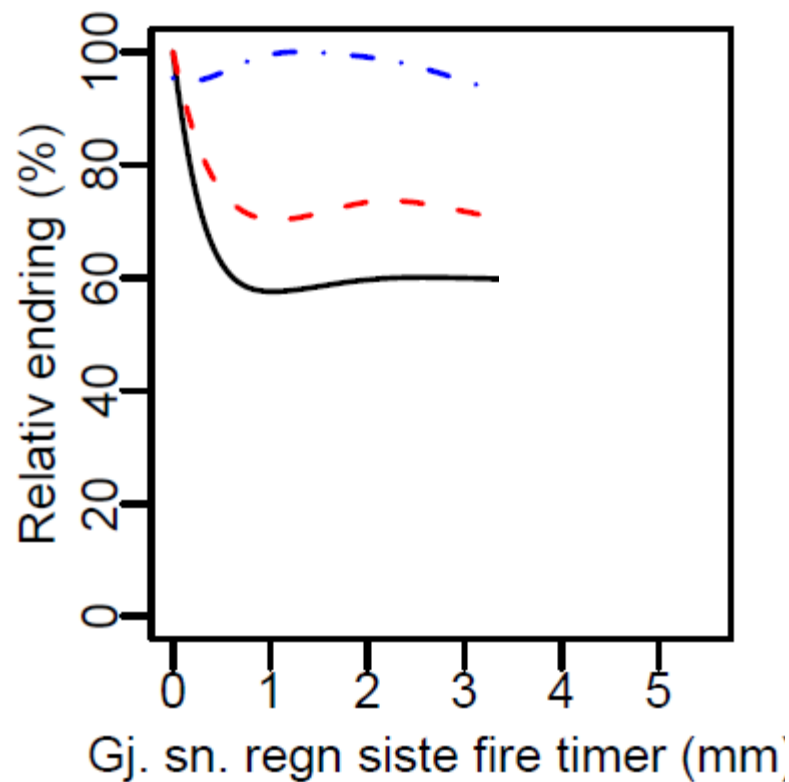
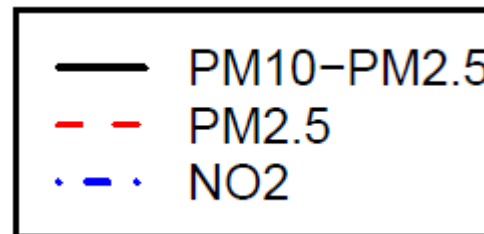
Værets bidrag





Analyse av luftkvalitet

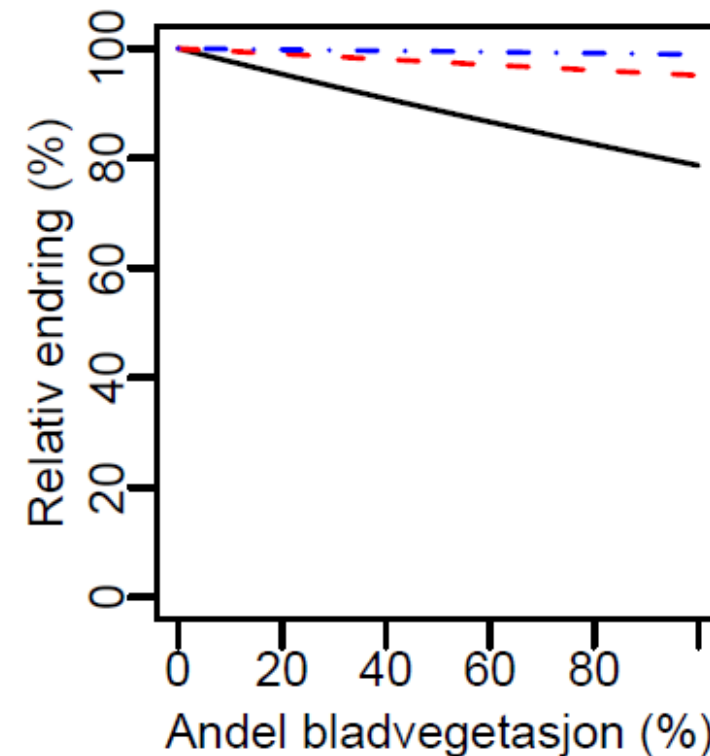
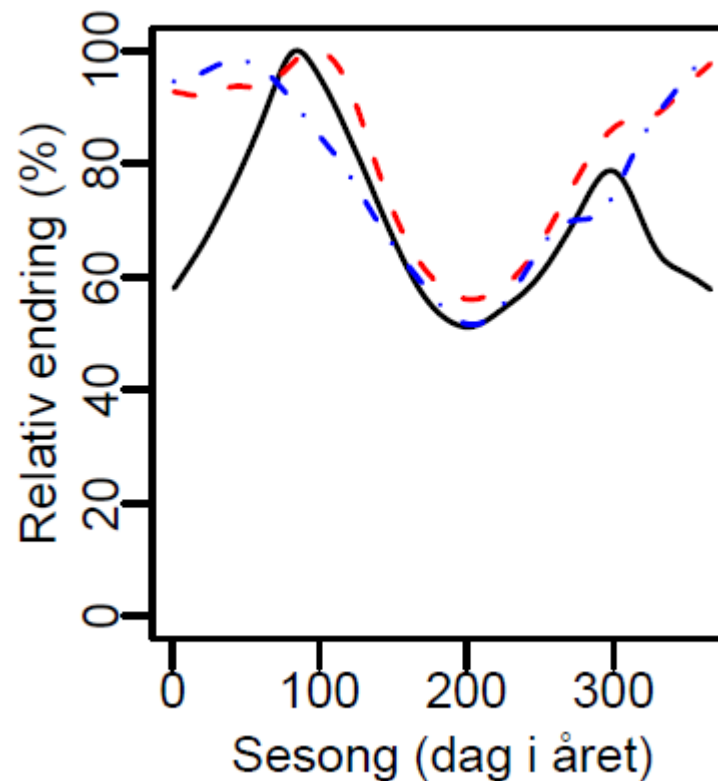
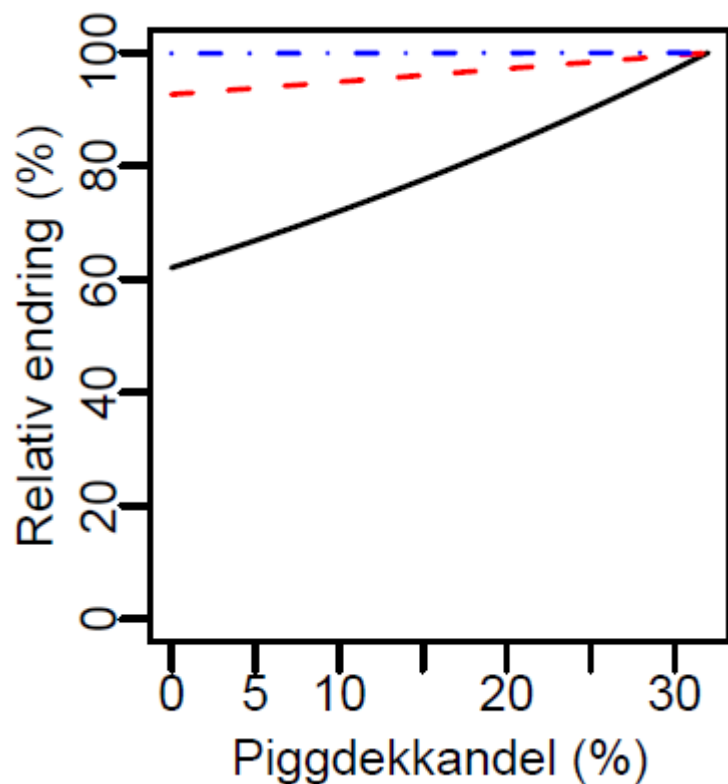
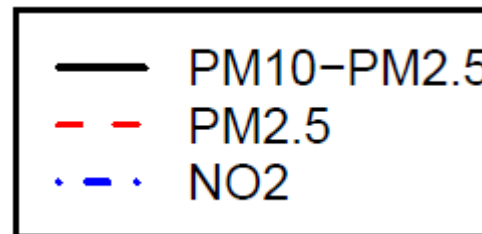
Værets bidrag





Analyse av luftkvalitet

Diverse bidrag





Piggdekk lager det meste av vegstøvet

Ringbaneforsøk på skjelett asfalt 8 mm i 70 km/t

Tire type	TSP (gram/h)	PM10 (%)	PM2.5 (%)	PM0.1 (%)	Inorganic content (%)
Studded tires	92.7	29	7.6	0.14	89.5
Non studded winter tires	2.3	13	3.5	0	85.5
Summer tires	3.0	10	7.8	0.11	73.4

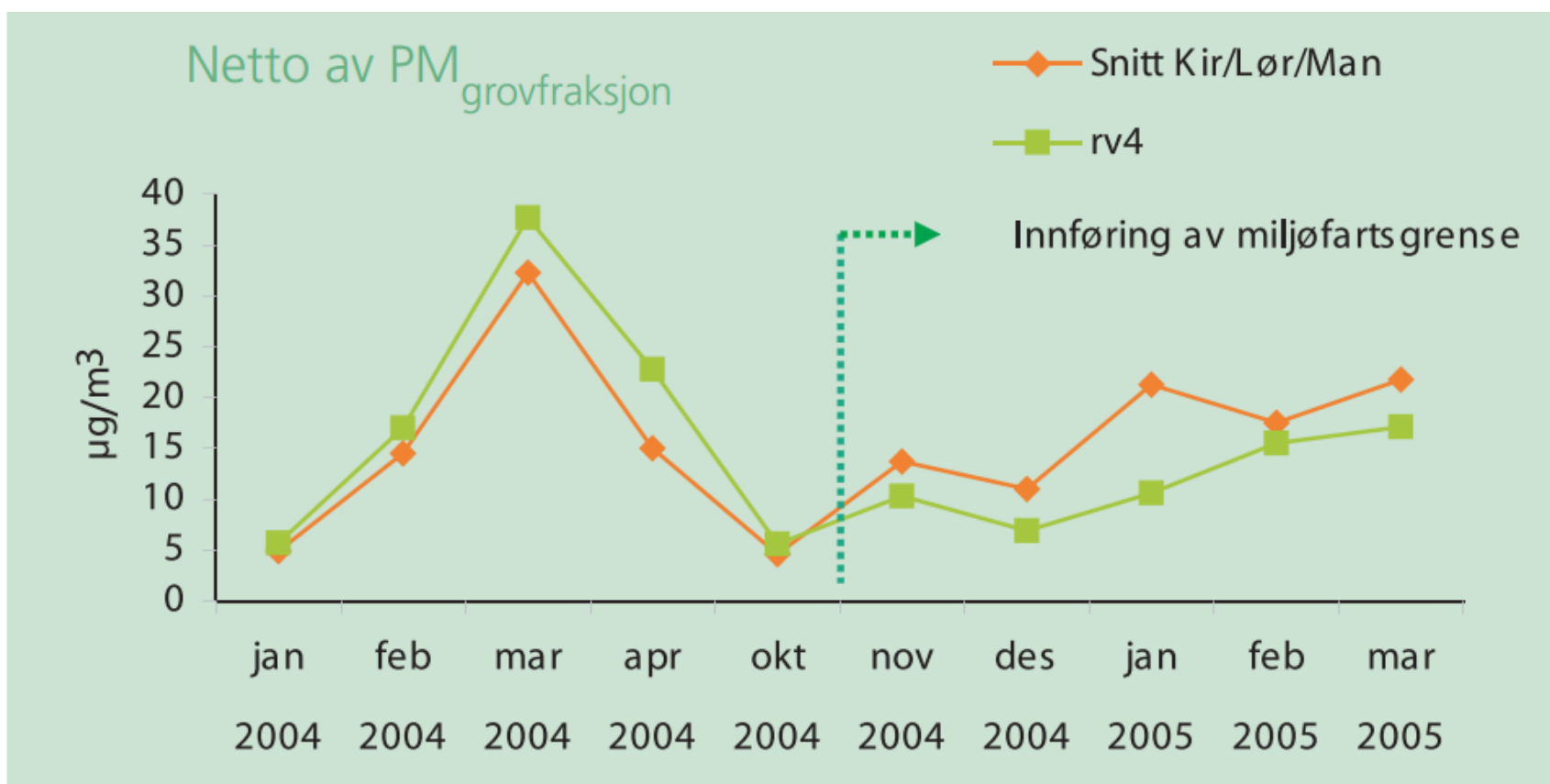
Piggdekk lager 50 ganger mer støv enn andre dekk og andelen svevestøv er høyere





Effekt av miljøfartsgrense i Oslo

Real fart fra ca 78 til 68 km/t på rv 4 i Oslo



Netto grovfraksjon på riksveg 4 i forhold til gjennomsnittet på Kirkeveien, Løren og Manglerud for hver måned i de to vintersesongene. Miljøfartsgrensen ble innført 1.11.2004.