Regional Consultative Workshop on Cross-Boundary Cooperation in Fire Management in South Asia
2-4 October 2016, Lalitpur, Nepal

Forest Fire Detection and Monitoring System in Korea

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Statistics of Republic of Korea

Topography

- High-East and Low-West
- Forest lands are located mostly mountainous and steep area

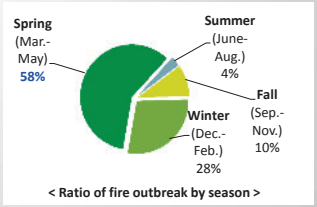
Forest

- Forest covers 64% of the land (forest area: 6.38 mil. ha)
- Pine forests (highly flammable) is 44% of the forest area
- 59% of dense forests are older than 30 years

Weather

- Hot, humid summer and cold, dry winter
- Annual rainfall(1,328mm)
- Fire seasons: Winter and spring (November-May)
- The most dangerous period: Spring (March-May)

※ Due to low precipitation and strong seasonal wind

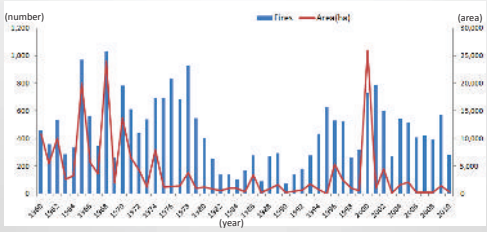


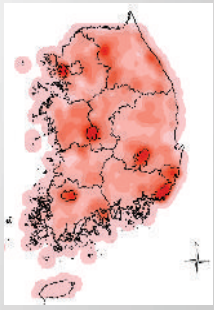
< Ratio of fire outbreak by season >

Statistics of Republic of Korea

Forest fires

- **395 fires** burn **466ha** in a year (10-year average)
- Accumulation of fuels for long time increased the number and the area of forest fires
- Fires tend to be concentrated near big cities (human-caused fires)

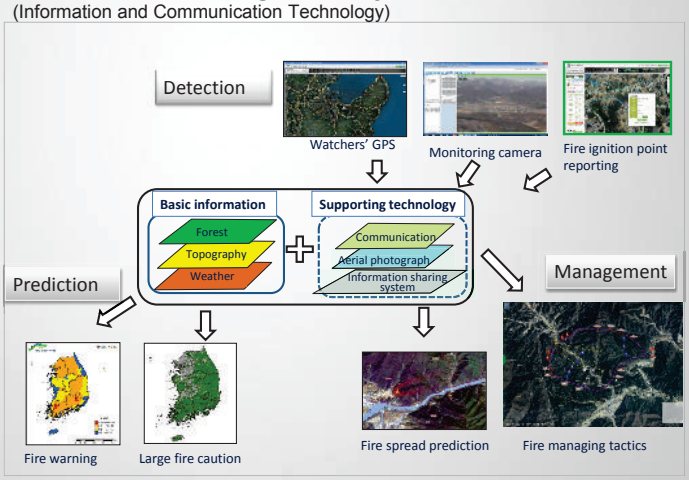




Spatial distribution of forest fires

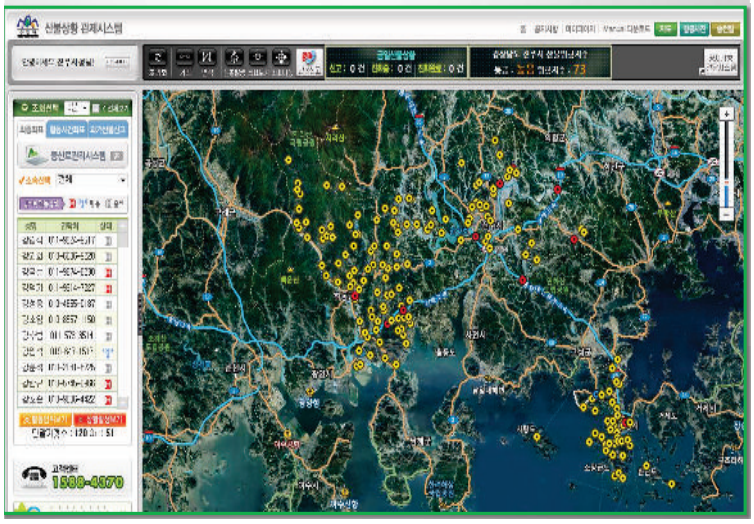
ICT-based Fire Management System of Korea

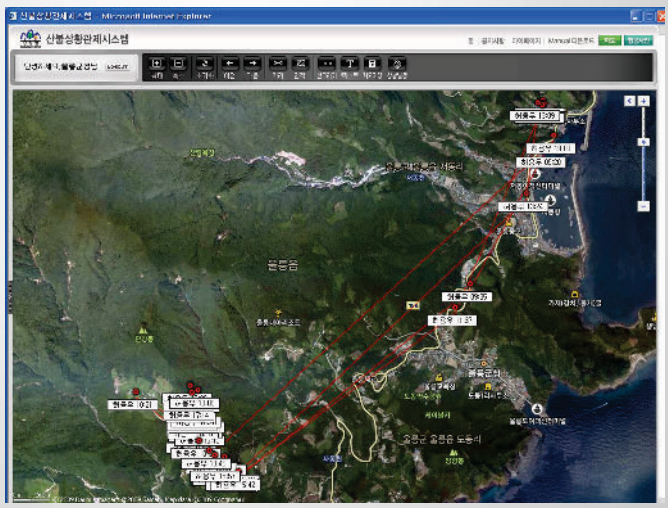
(Information and Communication Technology)

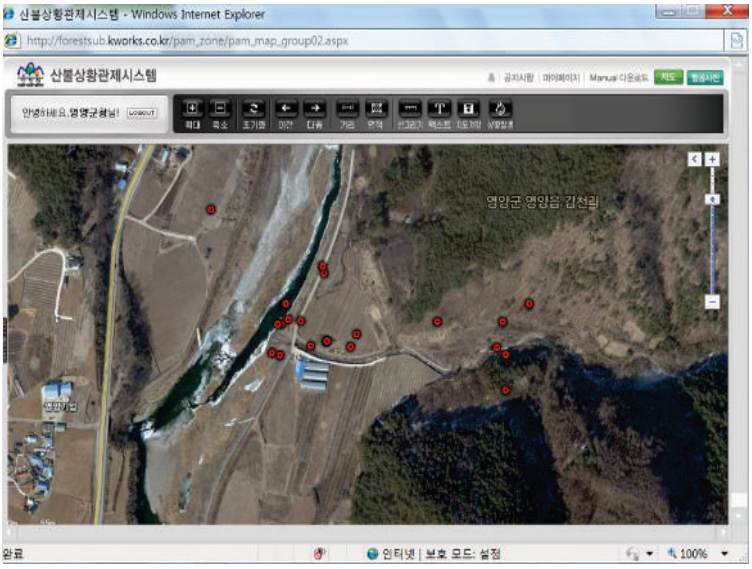


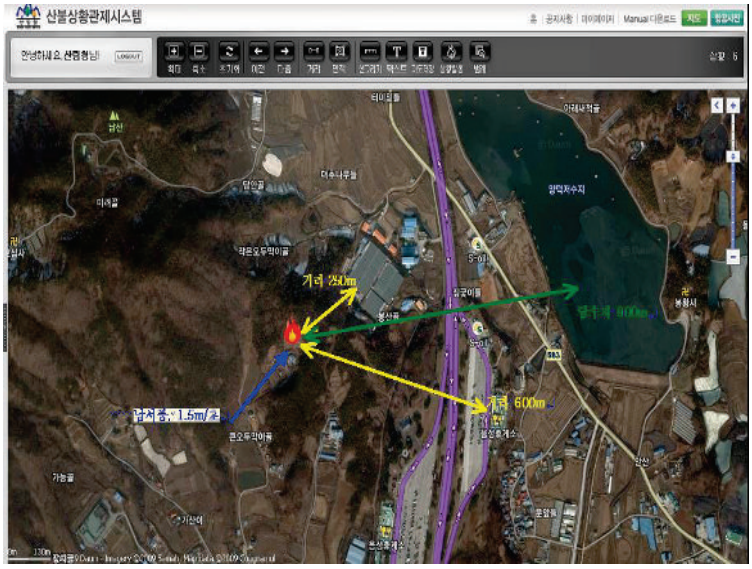
Forest fire detection system

Forest fire detection system





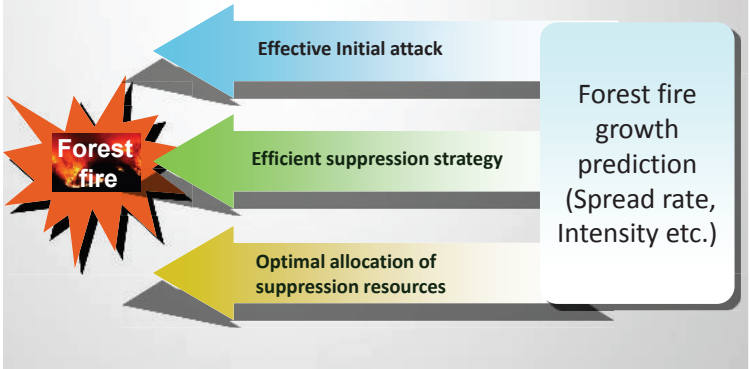




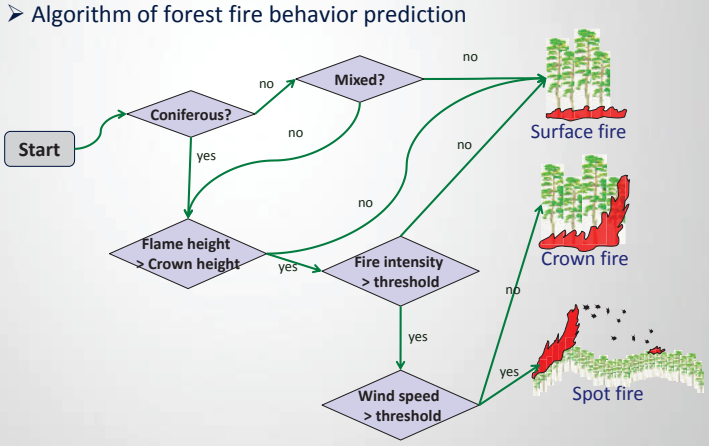
Forest fire monitoring system

Forest Fire Behavior Prediction System (FFBPS)

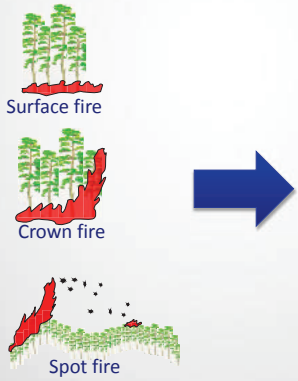
➢ Background



➢ Algorithm of forest fire behavior prediction



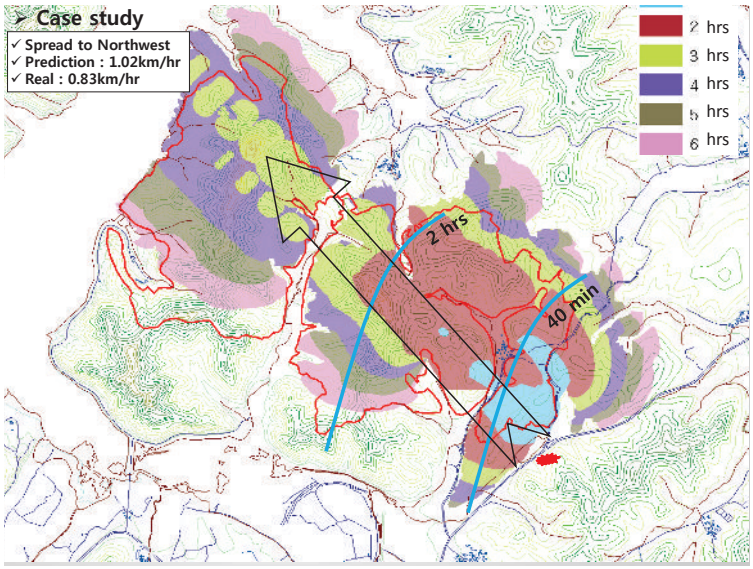
➢ The output of Algorithm of forest fire behavior prediction



- Prediction of fire behavior
- Calculation of burned area
- Building of suppression line
- Allocation of fire resources

➢ Case study

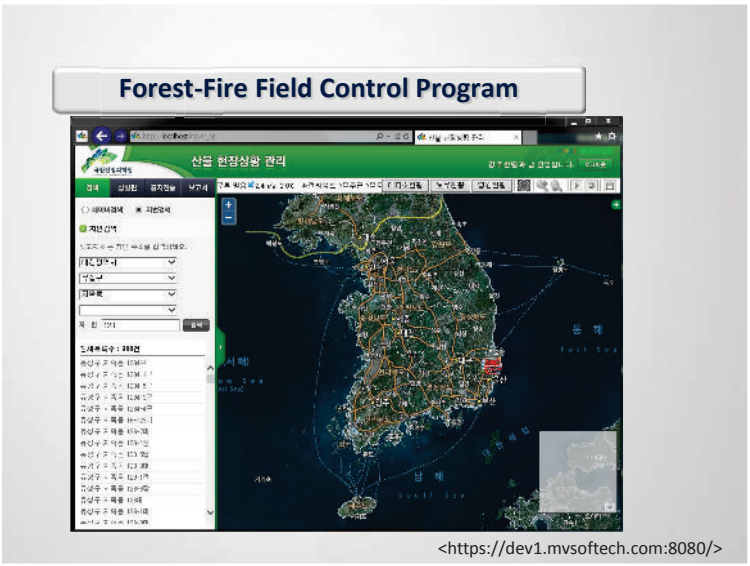
- ✓ Spread to Northwest
- ✓ Prediction : 1.02km/hr
- ✓ Real : 0.83km/hr



Forest fire information sharing system

How to share real-time information between control tower and field?

➡ Fast, correct decision making



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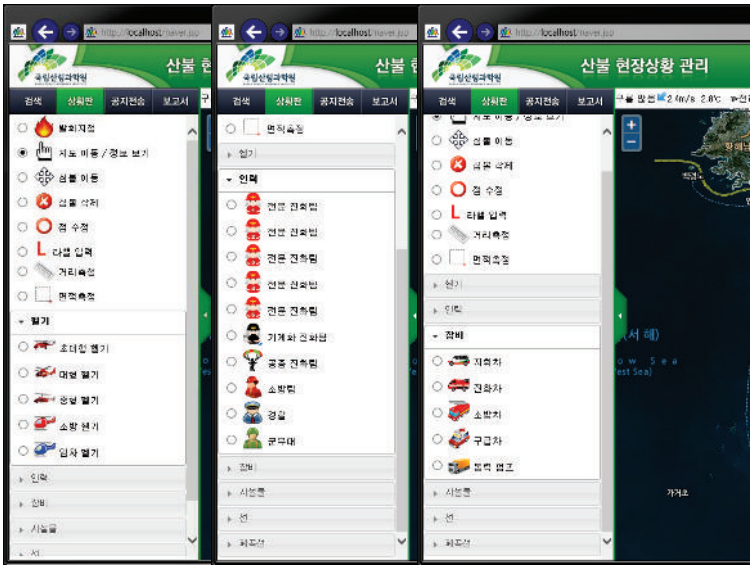
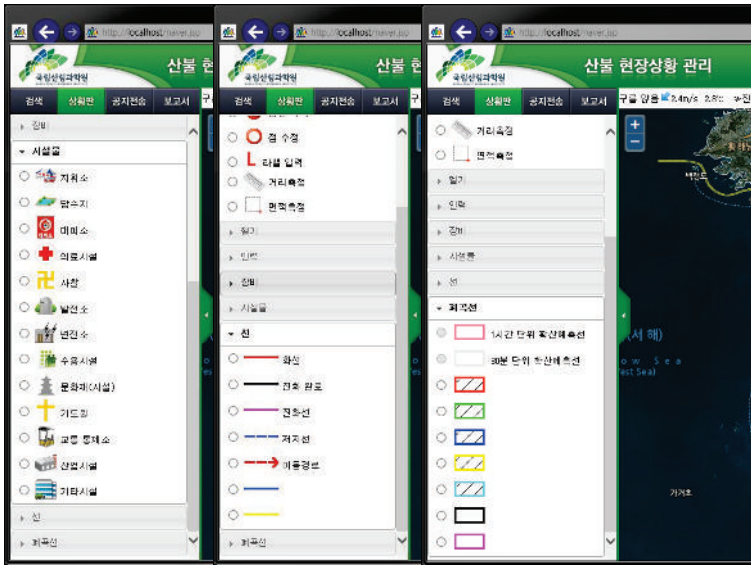
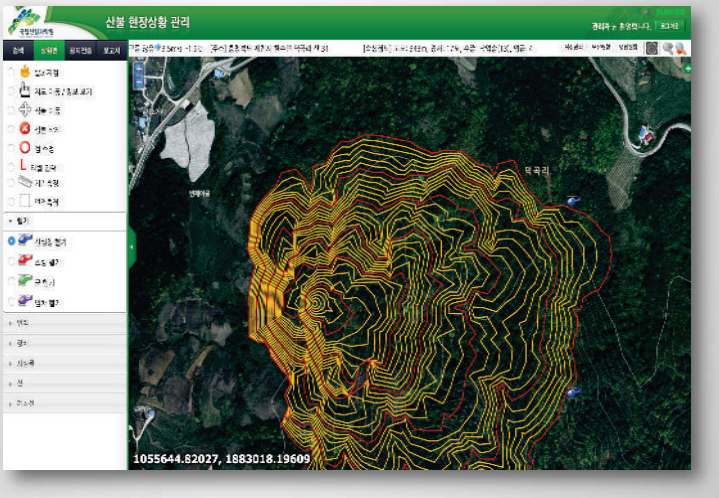
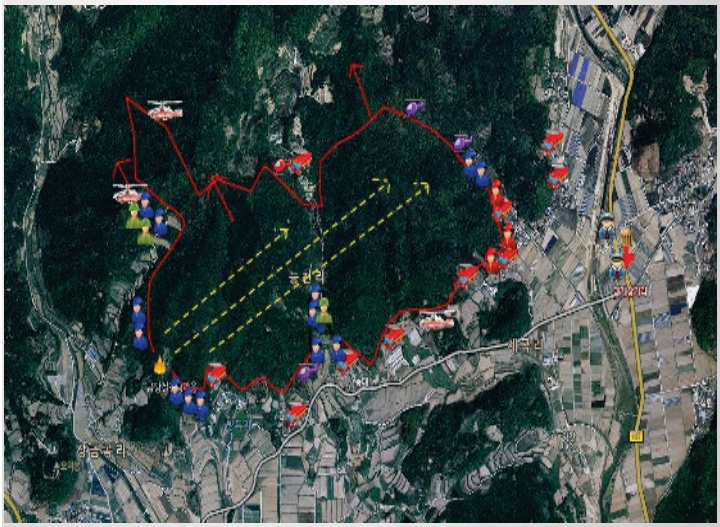


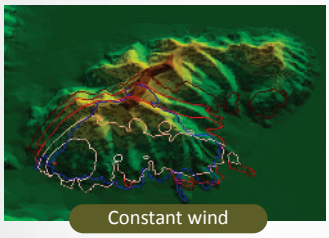


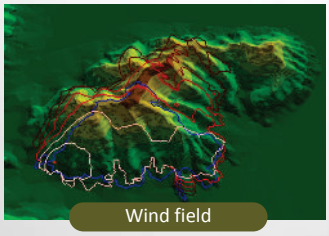


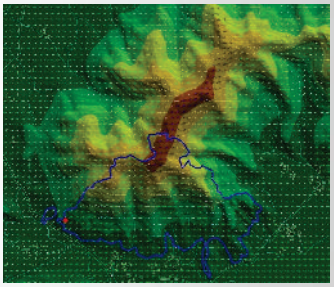


Yecheon, Korea (2016. 4. 2.)

Thank you for your attention!



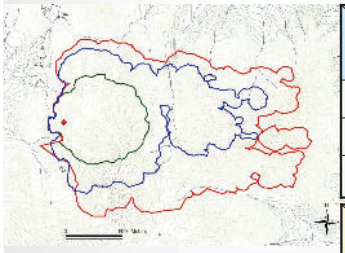




❖ Analysis of wind field

- Wind Ninja (RMRS, USA)
- Condition: west wind (270 degree), Wind speed 5m/s,
- main land cover : forest
- 37% accuracy ⬆

ROS with forest type



Deciduous
Mixed
Coniferous

Type \ Time	Distance (m)			ROS (km/hr)
	1hr	2hr	3hr	
Deciduous	188	264	724	0.24
Mixed	396	706	1,805	0.60
Coniferous	628	1,232	2,257	0.76

Type \ Time	Burned area (ha)			ROS (ha/hr)
	1hr	2hr	3hr	
Deciduous	4.1	16.8	49.1	16.3
Mixed	15.7	43.8	141.8	17.6
Coniferous	16.8	79.8	257.2	85.7