Supplementary material

Probabilistic prediction of wildfire economic losses to housing in Cyprus using Bayesian network analysis

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Table S1. Effect of influencing variables on housing economic loss (HDC) in the BN

HDC is estimated after giving evidence on each state of the variables. FWI, Fire Weather Index

Variable	States of the variable	Probability of variable being in the state $p(v)$	Expected value of HDC conditional for given value of the variable v [€] $E[HDC\|v]$	$(E[HDC\|v] - E[HDC])^2 \cdot p(v)$ Expected value of HDC: $E[HDC] = 18635$ €	Variance $\sum (E[HDC\|v] - E[HDC])^2 \cdot p(v)$	Standard deviation $\sqrt{\text{Variance}}$
Burnt area	0	0.11	0	$3.82 \cdot 10^7$	$6.08 \cdot 10^9$	$7.80 \cdot 10^4$
	<0.01	0.42	327	$1.41 \cdot 10^8$		
	0.01–0.1	0.31	3606	$7.00 \cdot 10^7$		
	0.1–1	0.12	36 178	$3.69 \cdot 10^7$		
	1–3	0.02	132 109	$2.58 \cdot 10^8$		
	3–10	0.01	430 013	$1.69 \cdot 10^9$		
	10–30	4e–3	10^6	$3.85 \cdot 10^9$		
Fire type	1	0.33	7556	$4.05 \cdot 10^7$	$3.05 \cdot 10^8$	$1.75 \cdot 10^4$
	2	0.50	13 199	$1.47 \cdot 10^7$		
	3	0.17	56 988	$2.50 \cdot 10^8$		
Construction type	5t_15s_80i	0.23	17 263	$4.33 \cdot 10^5$	$5.63 \cdot 10^5$	$7.50 \cdot 10^2$

	10t_25s_65i	0.77	19 046	$1.30 \cdot 10^5$		
Urban/Rural	urban	0.17	81 258	$6.67 \cdot 10^8$	$7.95 \cdot 10^8$	$2.82 \cdot 10^4$
	rural	0.83	6229	$1.28 \cdot 10^8$		
House stock	40s_25r_35a	0.17	81 258	$6.67 \cdot 10^8$	$7.95 \cdot 10^8$	$2.82 \cdot 10^4$
	70s_20r_10a	0.83	6229	$1.28 \cdot 10^8$		
Construction value	0–10,000	0.10	1353	$2.99 \cdot 10^7$	$3.09 \cdot 10^8$	$1.76 \cdot 10^4$
	10 000–50 000	0.29	7382	$3.67 \cdot 10^7$		
	50 000–100 000	0.41	13 472	$1.09 \cdot 10^7$		
	100 000–500 000	0.21	51 817	$2.31 \cdot 10^8$		
House density	0–3	0.15	515	$4.93 \cdot 10^7$	$2.75 \cdot 10^9$	$5.24 \cdot 10^4$
	3–10	0.25	2232	$6.73 \cdot 10^7$		
	10–30	0.34	6868	$4.71 \cdot 10^7$		
	30–100	0.18	19 736	$2.18 \cdot 10^5$		
	100–300	0.04	50 898	$4.16 \cdot 10^7$		
	300–1000	0.04	165 419	$8.62 \cdot 10^8$		
	1000–3000	7e–3	508 982	$1.68 \cdot 10^9$		
House damage	no damage	0.95	0	$3.30 \cdot 10^8$	$9.06 \cdot 10^9$	$9.52 \cdot 10^4$
	minor	0.03	172 405	$7.09 \cdot 10^8$		
	major	0.02	651 701	$8.02 \cdot 10^9$		
FWI	0–10	0.36	15 923	$2.65 \cdot 10^6$	$9.32 \cdot 10^6$	$3.05 \cdot 10^3$
	10–30	0.31	17 838	$1.97 \cdot 10^5$		
	30–60	0.31	21 542	$2.62 \cdot 10^6$		
	60–120	0.02	32 667	$3.94 \cdot 10^6$		
Distance to next fire station	0–5	0.27	18 001	$1.09 \cdot 10^5$	$2.24 \cdot 10^5$	$4.73 \cdot 10^2$
	5–10	0.46	18 632	4.14		
	10–30	0.27	19 287	$1.15 \cdot 10^5$		
Time for ground attack	5–10	0.27	18 001	$1.09 \cdot 10^5$	$2.45 \cdot 10^5$	$4.95 \cdot 10^2$
	10–15	0.23	18 419	$1.07 \cdot 10^4$		
	15–20	0.23	18 848	$1.04 \cdot 10^4$		
	20–25	0.27	19 287	$1.15 \cdot 10^5$		
Air suppression	no	0.50	32 286	$9.32 \cdot 10^7$	$1.86 \cdot 10^8$	$1.37 \cdot 10^4$
	yes	0.50	4984	$9.32 \cdot 10^7$		

Fire containment in 24 h	yes	0.91	0	$3.16 \cdot 10^8$	$3.30 \cdot 10^9$	$5.74 \cdot 10^4$
	no	0.09	200 635	$2.98 \cdot 10^9$		
Land cover	1	0.09	0	$3.13 \cdot 10^7$	$9.70 \cdot 10^7$	$9.85 \cdot 10^3$
	2	0.10	12 987	$3.19 \cdot 10^6$		
	3	0.04	18 082	$1.22 \cdot 10^4$		
	4	0.19	12 987	$6.06 \cdot 10^6$		
	5	0.21	33 119	$4.41 \cdot 10^7$		
	6	0.26	23 177	$5.36 \cdot 10^6$		
	7	0.02	0	$6.95 \cdot 10^6$		
Vegetation type	Grass	0.40	12 987	$1.28 \cdot 10^7$	$1.01 \cdot 10^8$	$1.00 \cdot 10^4$
	Forest	0.21	33 119	$4.41 \cdot 10^7$		
	Shrub	0.28	23 177	$5.78 \cdot 10^6$		
	No vegetation	0.11	0	$3.82 \cdot 10^7$		