Estimating Insect Distributions in remote Alaskan Landscapes not covered by Aerial Surveys

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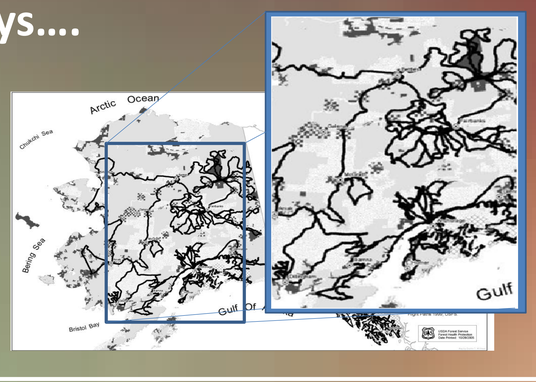
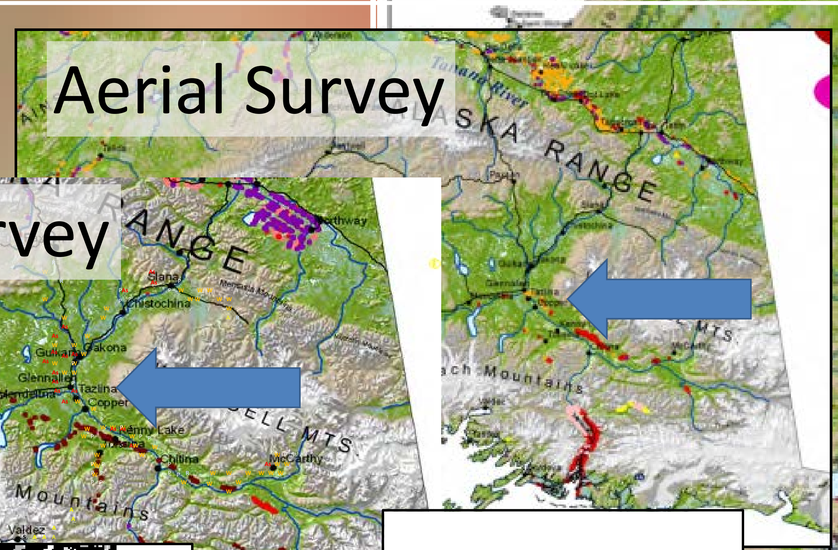
The Problem – Alaska is a very big state. Flight lines cover only a limited acreage during annual aerial surveys….

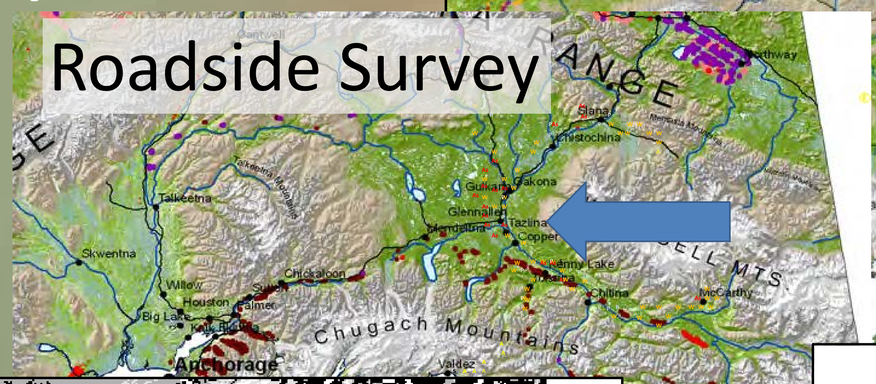


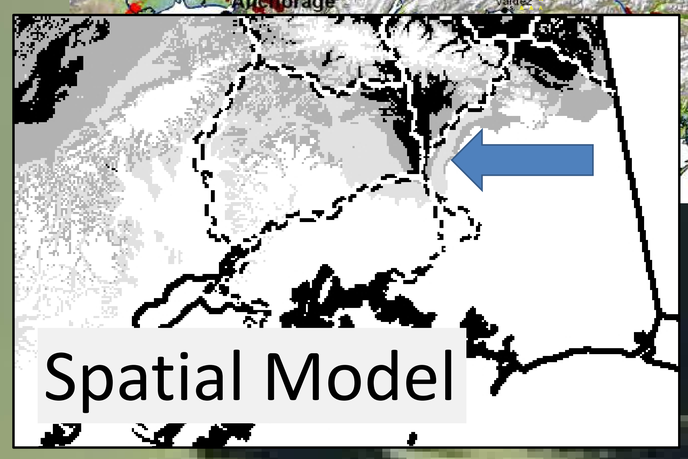
Only areas actually seen from the plane are assessed; pest affected areas between flight lines are not counted

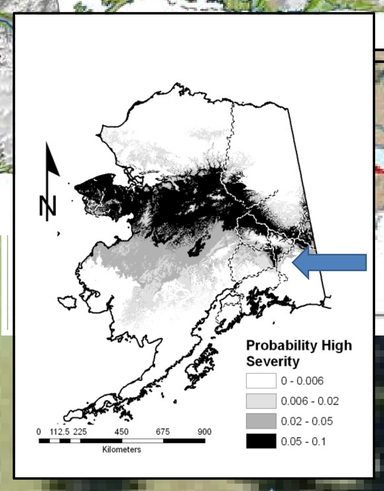
TABLE 1	national forest	native	other federal	state & private	Total ACRES
Abiotic causes	968	2,274	2,970	5,807	12,019
Alder canker	817	8,971	11,537	22,906	44,230
Alder defoliation	635	24	244	6,092	6,995
Aspen defoliation				1,750	1,750
Aspen Leaf Miner		108,295	144,395	200,967	453,658
Birch defoliation		154	4,295	28,842	33,290
Black-headed budworm		252		91	343
Cedar decline faders	28,666	630		1,212	30,507
Conifer defoliation	4,408	4,005	2,187	2,454	13,053
Cottonwood defoliation	178	4,612	4,027	5,268	14,085
Hardwood defoliation		715	865	665	2,245
Hemlock canker	314	83			397
Hemlock sawfly	6,932	1,236	110	824	9,101
IPS and SPB		1,550	470	178	2,198
Ips engraver beetle		7,866	11,663	2,071	21,600
Large aspen tortrix		1,517	2,088	4,986	8,592
Porcupine damage	638	12		269	919
Spruce aphid	20,331	1,543	5,120	13,686	40,680
Spruce beetle	1,567	6,648	56,317	13,452	77,983
Spruce needle rust	61	144	501	50	756
Willow defoliation	178	231,270	233,900	97,328	562,675
Willow dieback		37	199	489	725

Distribution of Aspen Leaf Miner









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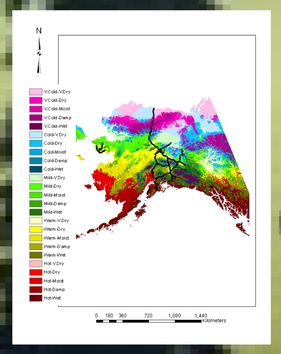

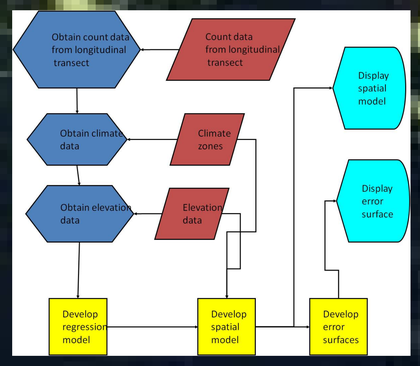

How much infested area was not accounted for?

Aerial Survey = 453,658 acres
Model Prediction = 9,599,989 acres

Only 5% of the infested area was counted.