Medfly Problem

1. Research Question (Nimrod Israely):

Does the Mediterranean Fruit Fly overwinter in the colder regions in Israel (e.g., Judean Hills), or does it re-invade them each winter from the warmer regions (e.g., the coastal plain)?

2 Data Description:

89 medfly traps , in different locations in central and southern Israel, were monitored for 27 weeks (5 Feb to 5 Aug 2000). For each trap, the following variables were recorded:

trap	trap id number
x	x-coordinate of trap
y	y-coordinate of trap
south	indicator variable (1 if trap is in southern region, 0 if in central)
alt	height of trap above sea level (m)
dist	distance (km) from trap to warmer region (containing possible sources)
loc_host	indicator variable for presence of host within 50m of trap
A	total number of flies caught in trap
W	week of first catch (if $A > 0$; $1 \le W \le 27$)

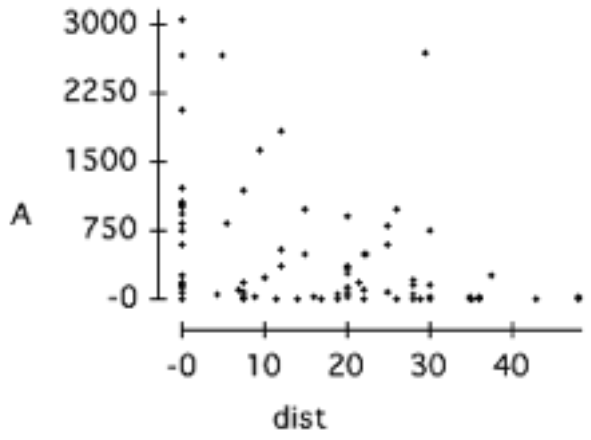
3. Use of Data:

If the fly migrates from warmer regions, then traps closer to the warmer regions (with small dist) will catch more flies (have large A), since the flies arrive earlier. If the fly doesn't migrate, then there should be no connection between dist and A.

4. Partial Listing of Data:

trap	x	y	south	alt	dist	loc_host	A	W
72	211353.7031	632340.875	1	726.6240234	29.5	1	2696	16
92	142408.4063	535646.1875	1	240.718399	30	1	7	18
97	142721	535212.8125	1	240.468399	30	1	169	19
910	142770.7969	535113.3125	1	244.8809052	30	0	32	19
911	142834.7031	535013.8125	1	246.4828949	30	0	1	9
913	145416.5938	536192	1	232.6737976	29	0	0	
916	145820.5	535984.375	1	240.7438965	29	0	0	
917	145947.4063	535880.5	1	240.6470032	29	0	13	20

5. Plot of Data and regression of A on dist



Dependent variable is: A
No Selector
R squared = 13.0% R squared (adjusted) = 12.0%
s = 639.1 with 89 - 2 = 87 degrees of freedom

Source	Sum of Squares	df	Mean Square	F-ratio
Regression	5318082	1	5318082	13.0
Residual	35533343	87	408429	

Variable	Coefficient	s.e. of Coeff	t-ratio	prob
Constant	753.647	111.5	6.76	≤ 0.0001
dist	-18.2033	5.045	-3.61	0.0005

6. Residuals from the regression