```
%%

load arthur_track

storm='arthur';
timestart=datenum(2014,7,4);
timeend=datenum(2014,7,6);
timeint=1/24;
buoynames={'44008';'44065';'44025';'44009';'44014'};
dates=timestart:timeint:timeend;
lonbuoy=nan(length(buoynames),1);
latbuoy=nan(length(buoynames),1);
winddir=nan(length(buoynames),length(dates));
windspd=winddir;
waveheight=winddir;

for n=1:length(buoynames)
    file=['http://dods.ndbc.noaa.gov//thredds/dodsC/data/stdmet/' buoynames{n} '/' buoynames{n} 'h' datestr(dates↙
(1),'yyyy') '.nc'];

    try
        lonbuoy(n)=ncread(file,'longitude');
        latbuoy(n)=ncread(file,'latitude');
        time=double(ncread(file,'time'))/60/60/24+datenum(1970,1,1);
        indt=find(time>=min(dates)-timeint/2&time<=max(dates)+timeint/2);
        if(~isempty(indt))
            time=double(ncread(file,'time',min(indt),length(indt)))/60/60/24+datenum(1970,1,1);
            dir=nan(size(time));
            spd=nan(size(time));
            wvh=nan(size(time));
            try
                dir=double(squeeze(ncread(file,'wind_dir',[1 1 min(indt)],[1 1 length(indt)])));
            catch
                disp(['no direction in ' file])
            end
            try
                spd=double(squeeze(ncread(file,'wind_spd',[1 1 min(indt)],[1 1 length(indt)])));
            catch
                disp(['no speed in ' file])
            end
            try
                wvh=double(squeeze(ncread(file,'wave_height',[1 1 min(indt)],[1 1 length(indt)])));
```

```
            catch
                disp(['no wave height in ' file])
            end

            for c=1:length(dates)
                indt=find(time>=dates(c)-timeint/2&time<dates(c)+timeint/2);
                winddir(n,c)=nanmean(dir(indt));
                windspd(n,c)=nanmean(spd(indt));
                waveheight(n,c)=nanmean(wvh(indt));
            end
        end
    catch
        disp([file ' DNE'])
    end
end


winddir=winddir+180;
test=abs([winddir windspd waveheight]);
test=nansum(test,2);
lonbuoy(test==0)=nan;
latbuoy(test==0)=nan;

disp('dataing done')


%%

xl=[-77 -67.5];
yl=[34 42.8];

load('/Users/hroarty/Documents/MATLAB/HJR_Scripts/Wind_Plots/parula-mod.mat')

bathy=load ('/Users/hroarty/data/bathymetry/eastcoast_4min.mat');
ind2= bathy.depthi==99999;
bathy.depthi(ind2)=NaN;
bathylines=[-40 -80 -200];

coast = load('/Users/hroarty/Documents/MATLAB/HJR_Scripts/Wind_Plots/MARACOOS_Complete_Coast.mat');
coast = coast.ncst;

load('/Users/hroarty/Documents/MATLAB/HJR_Scripts/Wind_Plots/neStateLines.mat');
```

```
 84
 85 lon(lon<min(xl)|lon>max(xl))=nan;
 86 lat(lat<min(yl)|lat>max(yl))=nan;
 87
 88 hurricane=imread('/Users/hroarty/Documents/MATLAB/HJR_Scripts/Wind_Plots/hurricane.png');
 89 ahurr=sum(hurricane,3);
 90 ahurr(ahurr>0)=1;
 91 ahurr(ahurr==0)=2;
 92 ahurr=ahurr-1;
 93
 94 tropstorm=imread('/Users/hroarty/Documents/MATLAB/HJR_Scripts/Wind_Plots/tropicalstorm.png');
 95 atropstorm=sum(tropstorm,3);
 96 atropstorm(atropstorm>0)=1;
 97 atropstorm(atropstorm==0)=2;
 98 atropstorm=atropstorm-1;
 99
100 tropdep=imread('/Users/hroarty/Documents/MATLAB/HJR_Scripts/Wind_Plots/tropicaldepression.png');
101 atropdep=sum(tropdep,3);
102 atropdep(atropdep>0)=1;
103 atropdep(atropdep==0)=2;
104 atropdep=atropdep-1;
105
106 ind=find(diff(tracktime)==0)+1;
107 tracktime(ind)=[];
108 tracklon(ind)=[];
109 tracklat(ind)=[];
110 tracktime_1h=min(tracktime):1/24:max(tracktime);
111 tracklon_1h=interp1(tracktime,tracklon,tracktime_1h);
112 tracklat_1h=interp1(tracktime,tracklat,tracktime_1h);
113
114
115
116 for n=1:length(dates)
117
118 [cs, h1] = contour(bathy.loni,bathy.lati, bathy.depthi,bathylines);
119 clabel(cs,h1,'fontsize',8);
120 set(h1,'Color', [96,96,96]./255, 'linewidth', .25)
121 hold on
122 cmap = colormap(cmap);
123 c = colorbar;
124 caxis([0 8])
125
```

```
126 wh=[];
127 ind=find(isnan(waveheight(:,n)));
128 wh=[wh,scatter(lonbuoy(ind),latbuoy(ind),150,'k','filled')];
129 ind=find(~isnan(waveheight(:,n)));
130 wh=[wh,scatter(lonbuoy(ind),latbuoy(ind),150,waveheight(ind,n),'filled','markeredgecolor','k')];
131
132
133 tanLand = [240,230,140]./255; %rgb value for tan
134
135 mapshow(coast(:,1), coast(:,2), 'DisplayType', 'polygon', 'facecolor', tanLand)
136 hold on
137
138 u=windspd(:,n).*sind(winddir(:,n));
139 v=windspd(:,n).*cosd(winddir(:,n));
140 w=quiver([lonbuoy;-70],[latbuoy;35],[u;10]/8,[v;0]/8,0,'k','linewidth',2);
141 text(-70,35,'10 m/s','verticalalignment','bottom');
142
143 indall=find(tracktime_1h<=dates(n));
144 indsmall=find(tracktime<dates(n));
145 indbig=find(tracktime==dates(n));
146
147 hourlytrack=plot(tracklon_1h(indall),tracklat_1h(indall),'k');
148 besttrack=[];
149 for k=1:length(indsmall)
150     if(trackcat(indsmall(k))>0)
151         besttrack=[besttrack,image([tracklon(indsmall(k))-.25 tracklon(indsmall(k))+.25],[tracklat(indsmall(k))-.25↙
tracklat(indsmall(k))+.25],hurricane,'alphadata',ahurr)];
152         besttrack=[besttrack,text(tracklon(indsmall(k))+.02,tracklat(indsmall(k))+.01,int2str(trackcat(indsmall↙
(k))),'color','w','fontweight','bold','horizontalalignment','center','verticalalignment','middle','fontname','futura','f↙
ontsize',8)];
153     elseif(trackcat(indsmall(k))==-1)
154         besttrack=[besttrack,image([tracklon(indsmall(k))-.25 tracklon(indsmall(k))+.25],[tracklat(indsmall(k))-.25↙
tracklat(indsmall(k))+.25],tropdep,'alphadata',atropdep)];
155     elseif(trackcat(indsmall(k))==0)
156         besttrack=[besttrack,image([tracklon(indsmall(k))-.25 tracklon(indsmall(k))+.25],[tracklat(indsmall(k))-.25↙
tracklat(indsmall(k))+.25],tropstorm,'alphadata',atropstorm)];
157     end
158 end
159
160 if(~isempty(indbig))
161     if(trackcat(indbig)>0)
162         besttrack=[besttrack,image([tracklon(indbig)-.5 tracklon(indbig)+.5],[tracklat(indbig)-.5 tracklat(indbig)+.↙
```

```
5],hurricane,'alphadata',ahurr)];
163         besttrack=[besttrack,text(tracklon(indbig)+.02,tracklat(indbig)+.01,int2str(trackcat↙
(indbig)),'color','w','fontweight','bold','horizontalalignment','center','verticalalignment','middle','fontname','futura↙
','fontsize',14)];
164     elseif(trackcat(indbig)==0)
165         besttrack=[besttrack,image([tracklon(indbig)-.5 tracklon(indbig)+.5],[tracklat(indbig)-.5 tracklat(indbig)+.↙
5],tropstorm,'alphadata',atropstorm)];
166     elseif(trackcat(indbig)==-1)
167         besttrack=[besttrack,image([tracklon(indbig)-.5 tracklon(indbig)+.5],[tracklat(indbig)-.5 tracklat(indbig)+.↙
5],tropdep,'alphadata',atropdep)];
168     end
169 end
170
171
172 xlim(xl);
173 ylim(yl);
174 box on
175
176 sl = plot(lon, lat, 'k.', 'markersize', 1);
177
178 grid on
179 xlabel('Longitude', 'fontsize', 12)
180 ylabel('Latitude', 'fontsize', 12)
181 project_mercator;
182 ylabel(c, 'Wave Height (m)', 'fontsize', 12);
183 title(['Measured Wind and Wave Height ' datestr(dates(n),'mmm dd yyyy HH:MM')])
184
185 set(gcf, 'paperposition', [0 0 11 8.5]);
186 set(gcf, 'paperorientation', 'landscape');
187
188 print(figure(1),['/Users/hroarty/COOL/01_CODAR/MARACOOS/20150206_Storm_Animations/' storm '_wind' datestr(dates↙
(n),'yyyymmddTHHMM')],'-dpng','-r200')
189
190 close
191 end
192
193 disp('plotting done')
194
```